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Platform affordances and spiral of silence: How perceived differences between Facebook and Twitter influence opinion expression online

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ABSTRACT

This study examines how perceived differences in the affordances of social media platforms influence users' willingness to express opinions on a controversial issue, viz., systemic racism. Drawing on a U.S. nationally representative survey, our analysis suggests that fear of social isolation has a significant effect on Facebook but not on Twitter. Moreover, three platform affordances — network association, anonymity, and social presence — moderate the relationship on Facebook, while anonymity has a direct positive effect on Twitter. We argue that increased perceived network association and social presence and reduced perceived anonymity on Facebook result in higher levels of self-censorship. Twitter's interest-based ties, on the other hand, enhance anonymity and, with it, the willingness to speak on controversial topics.

Social media platforms such as Facebook and Twitter have become the primary sites of public conversations about controversial issues, as evident from the global diffusion of digitally orchestrated movements such as #MeToo [1] and Black Lives Matter (Beckman, 2020; [2]. Even though social media created spaces for people to express their opinions, still some studies found that the spiral of silence (SoS) process still impacts people's willingness to express opinion on these spaces [3]. As the SoS theory argues, people tend to stay silent if they believe their opinions are not congruent with the majority [4]. Multiple studies have also shown the theory's primary operational variable—fear of isolation—drives self-censorship online [5,6].

Previous studies indicated that the expectation of social consequences, a crucial element of the Spiral of Silence, remains an important indicator of expressing opinions in online spaces [7,8]. However, scholars have argued that the process of SoS is not a straightforward or simplistic one. It is multifaceted and influenced by various other factors [9]. Studies suggest that the distinctive features offered by online platforms can exert a substantial influence on users' willingness to express their opinions [10,11]. Therefore, the primary focus of this study is to examine the underlying mechanisms that can potentially influence the process of the SoS on social media platforms.

The influence of platform affordances, as highlighted by Ref. [10]; plays a crucial role in shaping users' willingness to express themselves online. These affordances encompass the perceived capabilities and limitations of a platform in terms of facilitating or constraining self-expression. Understanding platform affordances is important as they shape users' perceptions of the platform's potential for self-expression [10]. By examining the influence of these affordances, we gain insights into how different platforms enable or restrict users' ability to express opinions on controversial issues. While earlier research has explored these concepts on individual platforms, such as Facebook, the differing affordances and their impact on online self-expression and the SoS process across platforms remain understudied [12].

To address these gaps, this study builds on [10] and other scholars' research on social media and SoS by comparing the impact of a comprehensive slate of variables on online self-expression across two platforms—Facebook and Twitter. We argue that due to perceived affordances users' willingness to express opinions on a sensitive issue may vary on two social media platforms (Twitter and Facebook) (Neubaum & Krämer, 2018; [9]. More specifically, the central construct of SoS, namely the fear of isolation, may exert divergent influences on individuals' willingness to express opinions online, depending on the perceived affordances of a platform.

We explore these relationships concerning the issue of "systemic racism," which became of heightened concern in the US and around the world following George Floyd's killing in 2020 [2]. The concept of

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systemic racism holds that discrimination based on racial differences is not simply an individual-level phenomenon but entrenched deeply in the policies of social institutions and the practices of society as a whole [13]. According to Pew Research, most Americans think "systemic racism" is a highly sensitive and polarizing issue, and it has worsened in recent years [14]. Therefore, it has a potential to discourage opinion expression.

Overall, our study aims to contribute to both SoS and social media research by demonstrating the differences in online expression across different platforms with different affordances. Moreover, our analysis underscores the role of social networks in shaping individuals' behavior pertaining to expressing their opinions. Specifically, we highlight the significance of network architecture within platforms, as it can influence users' perceptions regarding specific affordances. Consequently, these perceptions can impact individuals' levels of willingness to express their opinions, as they consider the potential consequences associated with these affordances. Lastly, the findings from our study hold potential implications for social media platforms, providing them with actionable insights to enhance their platform architecture in targeted ways. These adjustments can be designed to create an environment that fosters a greater sense of comfort among users when expressing their opinions on contentious matters.

1. Spiral of silence

In her foundational research on the Spiral of Silence (SoS) [4], argued that individuals who perceive their opinion to be in the minority may either conform their opinion to align with the majority or choose to remain silent due to the fear of social isolation. Consequently, dissenting opinions are less likely to be expressed, while the majority opinion gains perceived legitimacy and social support [4]. Empirical research has identified two conditions necessary for the SoS process to occur. Firstly, the issue being discussed publicly should be controversial and possess a moral component. Secondly, individuals must perceive the likelihood of social isolation as a consequence of expressing an opinion that contradicts the perceived majority viewpoint [5,15,16]. As a result, the theory has been applied to various controversial topics and contexts, such as gay bullying, women serving as judges (Gearhart & Zhang, 2013; Tso et al., 2022; Al-Kandari et al., 2021).

The Spiral of Silence theory originated at a time when traditional media served as the dominant source of information. According to Noelle-Neuman (1973) traditional media play important role in shaping people's perception of opinion climates. Therefore, understanding how this theory applies to traditional media becomes crucial for comprehending its evolution in the contemporary media landscape. When explaining the intricacies of the formation of public opinion, the spiral of silence theory integrates two core hypotheses: one addressing the impact of media on perceptions of public opinion and the other addressing individuals' propensity to conform to the majority [4]. Individuals indirectly gauge the prevailing opinion climate through media coverage of public issues. In that sense, traditional media function as a gauge for public opinion by conveying informational cues regarding the relative support and trends of contrasting viewpoints [17]. This media effect could give rise to a discrepancy between the perspectives held by individuals' peers and the depictions presented in the media. Noelle-Neumann (1994) contends that, in instances of such disparity, the media assume a more influential role in shaping perceptions of public opinion. She supports this assertion with reference to 'pluralistic ignorance' [18], a phenomenon in which the public erroneously perceives a minority stance to be the majority. Neumann argues that the traditional media's distortion of public opinion contributes significantly to the emergence of this phenomenon. Some other studies such as Zerback and Fawzi (2016) studied the effects of exemplar opinions in triggering a spiral of silence. Their findings suggested that traditional media, being a substantial source of public opinion, can significantly influence individuals' willingness to express their opinions. Other studies have also concluded that traditional media holds substantial sway over public opinion and can shape individuals' decisions regarding expressing their views (Bowen & Blackmon, 2003). Especially in the era predating social media, traditional media served as the dominant source of information, thereby wielding considerable influence over public opinion (Fox & Warber, 2014). Current research continues to underscore the enduring impact of traditional media on shaping public opinion (Djerf-Pierre & Shehata, 2017).

As the digital landscape evolved, however, the advent of social media introduced a new dimension to the spiral of silence, prompting researchers to explore individuals' expression of opinions in the online realm and the factors influencing their decisions, including issue importance and perceptions of the virtual environment (Gearhart & Zhang, 2013; Al-Kandari et al., 2021). Furthermore, studies concluded that individuals' relationship with the prospective audience of their opinions significantly influences their willingness to express opinions. For instance, research has explored the impact of social media interactions on the SoS (Procentese et al., 2019), suggesting that users may refrain from expressing unpopular or undesirable opinions to maintain their reputation within the online community (Sharevski, 2020). Scholars have also found that individuals' perception of their own opinion in relation to others' opinions on social media platforms affects their willingness to express their views (Bäck et al., 2018).

The SoS theory posits that individuals' inclination to withhold their opinions is primarily driven by the perception of being in a minority position, which subsequently amplifies their fear of social isolation. Factors such as strong interpersonal connections and past negative encounters can influence this fear (Neuwirth, 2017; Rui et al., 2022). Scholars have also explored another closely related concept, communication apprehension, which refers to trait-based fear of isolation. Both variables measure how personality-related factors increase users' communication anxiety (McCroskey, Beatty, Kearney, & Plax, 1985; [19]. In this study, however, we focused on the concept of contextual fear of isolation. Although there is no explicit definition, it is related to specific issues, situations, and networks. For example, individuals may fear isolation when expressing their opinions on a controversial or morally loaded issue within a particular social or cultural context [19]. In the context of social media, contextual fear of isolation arises when individuals anticipate negative social consequences, such as being ridiculed, unfriended, or blocked. This fear is influenced not only by being in a minority situation but also by social norms, network strengths, and potential sanctions associated with expressing dissenting views (Neubaum & Krämer, 2018; [11]. Therefore, fear of isolation is amplified by the anticipation of retribution from one's social circle [19].

Overall, as the literature suggests, users' willingness to express opinion and their perceived fear of isolation may be shaped by the characteristics of platforms as presented by Hoffmann & Lutz (2017), the type of discussion channel as explored by Neubaum & Kramer (2018) and the perception of audience as argued by Ref. [8]. In light of this, our study adopts a situational perspective and examines individuals' perceptions of affordances on two distinct online platforms (Twitter and Facebook) to understand how these perceptions may impact their willingness to express opinions and fear of isolation. In the next section, we provide a comprehensive definition of the chosen affordances and elucidate the underlying rationale for positing their potential impact on the process of SoS. The identified affordances, namely network association, social presence, and anonymity, are important factors that are expected to influence the SoS process. By delving into the specific characteristics and mechanisms of these affordances, we aim to establish a clearer understanding of their potential implications and significance within the context of social media dynamics.

1.1. Key social media platform affordances

Recent literature suggests that social media users are aware of

varying social media affordances (Bayer et al., 2016 [10]; and some studies tested the impact of social media affordances on users' willingness to express an opinion on social media (e.g., Ref. [10]; Neubaum, 2022). However, many of these focused on either one affordance or one platform (e.g., Ref. [10]. However, in this study we focus on three important affordances and how these affordances impact the SoS process on two popular social media platforms.

We define affordances as "action possibilities" that vary across physical or virtual environments, such as social media platforms [20]. Evans and colleagues (2017) describe them as the "multifaceted relational structure between an object/technology and the user that enables or constrains potential behavioral outcomes in a particular context" ([21], p. 36). As it relates to the SoS, affordances are vital to consider because we suggest they are able to moderate the relationship between fear of isolation and opinion expression behavior [10]. Grounded in prominent research conducted by Ref. [10]; we identify three key social media platform affordances; *network association, social presence, and anonymity*. *These* affordances are closely related to online opinion expression [11,22]. Social presence is the sense of being in the same place as others, even if you're communicating online. It plays a crucial role in online opinion expression as people feel more comfortable expressing their opinion when they feel a sense of connection with others in the online space [22]. Anonymity is also important because it allows people to express their opinion without fear of repercussions. It provides a sense of safety and security for people to express their thoughts and feelings without fear of judgement or retaliation [23]. The phenomenon of network association, or the perceived connection to a group of individuals, has been found to play a significant role in shaping online opinion expression. Research suggests that when individuals perceive themselves to be part of a group, they may be inclined to conform to group norms in order to preserve social harmony and avoid potential social sanctions from their network [11]. In this section, we define each affordance and provide justification and rationale for their inclusion in this study.

The first affordance we examine is network association [10]. defined network association as "the ability for people to identify friends of friends and other distal ties through visibly linked user profiles" (p. 8). In this sense, the network association variable is related to one's identifiability, and connections. In social media, users have different connections, such as relatives, close friends, and colleagues. Studies suggested that different types of connections make it difficult for users to maintain boundaries with their audiences, leading to context collapse (Neubaum, 2022; Vitak, 2012). It also has been found that social media users may self-censor themselves due to the heightened risk of isolation when they perceive a diverse audience (Hoffmann & Lutz, 2017). Additionally, the strength of network association has been found to correlate with increased levels of social cost and emotional attachment, which may lead to self-censorship [8]. From this point, we can argue that users may feel less comfortable expressing their opinions when their network association is high [10] because high network association is related to high visibility and awareness of one's primary network and other networks. In that regard, network association and context collapse are closely linked since network association means users' awareness of their network. For example, users who perceive high network association are aware of different types of users in his/her network such as relatives, colleagues and close friends. As scholars argued that different users require different presentations [24]. Therefore, users might find it difficult to express their opinions on a sensitive topic since they are aware of a diverse audience. On the other hand, if an individual lacks a strong network association or feels that their views are not supported by their online community, they may be less likely to expect social sanctions when expressing minority opinions. In this case, the lack of social connectedness may reduce the influence of the majority view on the individual's behavior and decrease their expectations of social sanctions such as isolation.

The second affordance is social presence, defined as "the degree to which people perceive each other as real in mediated communication" (Fox & Ewan, 2017, p.302). Prior research has suggested that people might feel freer when they interact online due to a lack of social presence [25,26]. For example [27], found that people perceive higher social presence in offline environments than in online environments, and a high level of social presence leads to self-censorship. In computed-mediated communication, the perception of social presence might depend on both the platform and the person users communicate with. For example, if users have already known the person they are communicating with on an online platform, this might increase their perception of social presence. Also, if a platform requires a reciprocal relationship (like Facebook's friending process), then the reciprocity might increase social presence. Despite the fact that social media platforms offer fewer social cues than offline environments, some platforms encourage practices such as the sharing of personal and identifying information, which is likely to boost perceived social presence. Owing to the notion that Facebook, more so than Twitter, is used to connected users with real-world social ties, it's likely that perceived social presence is higher on Facebook than Twitter [28]. Especially, increased identifiability, personal information sharing and reciprocal relationships may contribute to a high sense of social presence and an increase in perception of social presence may be related to less willingness to express an opinion [27]. In this study we argued that social presence may moderate the relationship between willingness to express opinions online and fear of isolation. Specifically, it is hypothesized that individuals who perceive higher levels of social presence on a given platform will be less willing to express their opinions and more fearful of isolation than those who perceive lower levels of social presence. The reason for this is that social presence can create a sense of community and belonging, which may intensify fear of isolation. When people feel connected to others online, they feel that they are part of a group. However, when they express minority views, there is a possibility of hurting the feelings of group members. Thus, when social presence is high, individuals may be afraid of being isolated and disconnected from others, leading to a reluctance to express their opinions for fear of being rejected or ostracized.

The third affordance, anonymity, is not a dichotomous concept — either anonymous or not, or technical anonymity — but is more flexible in nature (Evans et al., 2017). Some scholars draw attention to the social aspect of anonymity [29]. It refers to the perception of not being identifiable. In terms of online engagement, the social aspect of anonymity is particularly important. Perceiving a lack of identifiability means less accountability and minimal risk of facing social consequences as a user's online identity is not connected to their "real identity" [30] Evaluating the degree of perceived identifiability when voicing opinions within a specific context is a crucial aspect of the SoS theory (Hayes & Matthes, 2014). Thus, separating themselves from their real identity might encourage people to discuss sensitive issues in online spaces [31]. Prior studies suggested that users might imagine different audiences on Twitter versus Facebook (Chen, 2015; Oz et al., 2018). Thus, users might feel more or less identifiable and accountable for their actions depending on the imagined audience [8,11]. Some scholars also suggested that users may feel de-individuated due to a lack of identifiability on social media (e.g., Ref. [32]. De-individuation concept is related to perceived anonymity. However, people can feel deindividuated even when they are not fully anonymous (Ellmers, Spears & Doosje, 2002; [11]. So, in this sense, the perception of anonymity is closely linked to the lack of identification. In some cases, users might believe their identity on social media will be not noticed by others because of lack of identifiability and this may lead to a lack of accountability (Lowry et al., 2016) and an increase in one's willingness to express an opinion [10]. Research has shown that people value their close relationships and experience stronger emotional bonds [8]. Thus, strength of network ties may have the power to amplify individuals' sense of responsibility and consequently may intensify their fear of isolation. Furthermore, research has indicated that users' perception of having limited control over their

audience leads to a decreased inclination to express minority opinions on online spaces as compared to in-person interactions (Neubaum, 2021). Therefore, accountability in expressing opinions may be influenced by knowledge of others.

Overall, when it comes to online platforms like social media, the absence of social cues presents challenges in assessing the potential costs of expressing an opinion. In such contexts, the affordances provided by each platform play a crucial role in understanding the potential costs associated with opinion expression on emotionally charged issues [11]. Thus, the perception of social media affordances can either magnify or alleviate individuals' concerns regarding social isolation, thus influencing the SoS process on social media platforms. Some recent studies also contend that platform affordances determine users' behavior in online spaces [10,33]. For instance Ref. [10], proposed that individuals experience reduced levels of personal responsibility for their behavior when they are in an anonymous or less identifiable state. Similarly, Oz & Cetindere (2023) found that affordances such as identifiability and anonymity can lead to deindividuation, encouraging participants to express their opinions on social media platforms due to reduced fear of isolation concerns. Additionally, scholars argue that social media users are goal-oriented and they are aware of social media affordances when using these platforms [34]. From this point of view, we argue that the impact of fear of isolation may vary based on the perceived affordances of each platform.

H1: Perceived affordances will moderate the relationship between fear of isolation and willingness to express opinion on both platforms.

1.2. Characteristics of Facebook and Twitter

To investigate platform affordances, this study considers two well-known social media platforms; Facebook and Twitter. We explore Facebook and Twitter because of their widespread use [35] and prominence as an arena for news and informational content engagement (Shearer & Mitchell, 2020). In addition, the longevity of these platforms' use has allowed users to adopt habitual and "ritualized" behaviors for each platform according to its distinctive features [36]. Verisimilarly, the longevity of use, the persistent widespread popularity, and habitual user practices for each platform, it is a logical deduction that multiple individuals will have an account on both platforms, be familiar with the particular attributes of each platform, and have developed, at least tangentially, differentiated perceived affordances for both Facebook and Twitter.

At first glance, Facebook and Twitter may appear to be similar platforms, each amalgamating user content with external content sources. However, under closer inspection the two platforms are separated by multiple critical distinctions [11]. Foundationally, Facebook users form their individualized (user specific, personal) networks with close relational ties, such as with real-world family, friends, and acquaintances. Conversely, user networks on Twitter are constructed based on ideas and topics of interests, with users often having distant or non-existent relational ties to those they 'follow'. Notably, unlike Facebook networks that are mutually established by both parties, Twitter users are able to follow individuals without reciprocation [28]. Correspondingly, whilst Twitter is dominated by 'trending' topics of interest, Facebook more closely reflects content created or engaged by a user's network friends.

Another difference, which is important for opinion expression, relates to character limits for user-generated content creation. Whilst Facebook offers an unlimited format, Twitter users are capped at 280 characters per post. Despite this, both Facebook at Twitter support the re-sharing of content (termed 'sharing' on Facebook and 'retweeting' on Twitter), incorporate non-verbal cues of expression (such as 'liking' on Facebook and 'favoriting' on Twitter), and allow textual engagement (such as 'commenting' on Facebook and 'replying' on Twitter).

Besides the differences in platform design, studies indicate that when individuals are able to recognize or identify others, their willingness to express dissenting opinions diminishes (Luarn & Hsieh, 2014). Anonymity holds particular significance, as various studies have shown that different types of audiences have varying impacts on opinion expression [8]. Certain social connections may have a more substantial influence on the expression of opinions than others. For instance Ref. [37], discovered that the perceived significance of social media contacts significantly predicts opinion expression in online environments. Users typically assess the possible social ramifications of expressing their opinions by considering their social network, making efforts to avoid adverse social consequences, such as the potential loss of real-world relationships. This tendency is particularly prominent when users have a strong familiarity with others on social media platforms (Rui et al., 2022; [11]. Studies have found that Facebook users may refrain from engaging in certain activities, such as liking certain pages, due to concerns about creating a negative impression on others. These users may worry that the pages they like will be viewed unfavorably by others, and that this could reflect poorly on their own reputation or image [37].

Earlier studies have indicated that individuals tend to develop emotional attachments to those who are in close proximity to them [38]. In this context, the tie strengths closely correspond to the affordances provided by social media platforms (Granovetter, 1973). For instance, on platforms like Facebook, people often connect with their existing social connections and share significant personal information [8,11]. This facilitates the identification of one's social network and its members, as well as allowing others within the network to identify them. Users who are able to recognize their social network within social media platforms tend to attribute more significance to their strong connections and undergo an increased emotional bond [8]. Consequently, users may perceive expressing opinions on identifiable networks like Facebook as carrying high social costs [8]. Conversely, when users believe that their identities are less likely to be noticed, they may perceive a lack of connection between their actions on social media platforms and their actual identities [10]. For example, Twitter exhibits unique traits like a larger presence of unfamiliar individuals and infrequent interactions, which can foster an atmosphere where users experience reduced concerns about isolation when sharing perspectives on emotionally loaded subjects. This notion is supported by additional research indicating that the fear of isolation is typically less prevalent among unfamiliar individuals and more prominent within tightly-knit and frequent social connections (Lee et al., 2014, p. 187; [39]. Moreover, a recent study revealed that individuals perceive greater levels of deindividuation on Twitter compared to Facebook. This heightened deindividuation on Twitter is associated with decreased accountability and heightened concerns regarding fear of isolation [11].

In this research, we contend that users may have distinct conceptualizations of their networks on different platforms. Furthermore, their perception of the audience and the communication context can shape their expectations regarding potential social sanctions, including the fear of isolation (Wu & Atkins, 2018). Again, users reveal their real names and some personal information on Facebook, such as their occupation, where they live, and where they are from [40] and users connect with people whom they already know. This makes it easier for users to identify people in their network on Facebook. On the other hand, people tend to follow and be followed by strangers and distant ties on Twitter (Chen, 2015). Unlike Facebook's friending process, the following process on Twitter is often not reciprocal. So, while the relationship between friends on Facebook is reciprocal, this is not the case on Twitter. Twitter users can follow or be followed by strangers (Chen, 2015). Thus, it is possible that users may perceive varying levels of network association across platforms, with higher perceived network association on Facebook compared to Twitter.

Overall, we argue that no two social media platforms are alike, each occupying a different online communicative niche [37]. Supporting different functionalities and underpinned by divergent mechanisms through which one constructs their individualized social media experience [8,37], it is likely that varying social media platforms elicit

differing perceived affordances (Bayer et al., 2016; [10], which in turn may impact how the SoS operates among platforms [41]. Indeed, this notion offers one explanation as to why studies examining the application of the SoS on social media have returned such inconsistent results among multiple platforms [6,10]; Neubaum, 2022; Wu & Atkin, 2018). Based on these findings, we anticipate that users' perceptions of specific affordances will differ across platforms due to variations in platform characteristics and imagined audience (Twitter versus Facebook). So, we hypothesized that users' perception of affordances will vary between Facebook and Twitter.

H2: Perception of a) network association, b) social presence and c) anonymity affordances will vary between Twitter and Facebook.

2. Method

A web-based survey was conducted to understand the impact of users' perception of the affordances of Twitter and Facebook on their willingness to express their opinions on these platforms. The survey was conducted between October 12, 2021–October 19, 2021.

3. Sample

The survey specifically targeted individuals who were actively engaged in expressing their opinions on both Twitter and Facebook and had a minimum of 100 followers on Twitter and friends on Facebook. To assess active use, we employed two filtering questions. The initial question inquired whether respondents checked their Facebook and Twitter accounts at least twice per week, while the second question focused on whether they had expressed their opinions on political and civic matters on either Facebook or Twitter within the preceding three months. Additionally, respondents had to be at least 18 years of age. Prolific, a survey company, was asked to recruit the participants, who were paid $0.75 upon completing the survey. A panel similar to the U.S. 2020 census demographics was requested from the survey company. Even though, the panel was very similar to the U.S. 2020 Census demographics, it is slightly skewed towards younger (M = 1.92) and more educated (M = 3.4) individuals. A total of 416 respondents participated in the survey. Of these, 52 respondents provided incomplete data, and another nine said they were not actively using both Facebook and Twitter. These respondents were removed from the data set. The final sample included 355 participants. In light of the precedent set by previous studies (e.g., Liu, Rui & Ciu, 2017; [10], our sample size of 355 participants is well-justified. This aligns with established practices in the field and ensures our study's capacity to detect meaningful effects while maintaining feasibility.

It's important to note that in terms of demographic alignment with the U.S. 2020 Census, our sample exhibits a general representation, albeit with discernible distinctions. Notably, the sample showcases a slightly higher educational attainment, characterized by an increased proportion of individuals holding a Four-Year College or Terminal Degree compared to the broader population. This finding suggests a potential skew towards a more educated cohort within our participants. Furthermore, there is a marginal overrepresentation of White individuals in our sample. **(Please** see Table 1 for detailed demographic statistics).

The respondents answered questions related to their social media use, perception of social media affordances for each platform, and willingness to express an opinion about the racial inequality issue on Twitter and Facebook. We decided to ask about racial inequality because, according to Pew Research, the U.S. population was divided on racial inequality. For instance, according to a report by Pew Research (Horowitz et al., 2019), approximately half of the population acknowledges that being black or Hispanic places individuals at a societal disadvantage. Also, they reported that the likelihood that white Democrats and those leaning toward the Democratic Party will say being white helps one get ahead is about twice as high as that of white Republicans and Republican leaners (Horowitz et al., 2019). Furthermore, Racial inequality, as a controversial and morally charged issue, has historically evoked strong emotions and impassioned debates [42]. These studies showed that racial inequality is a divided issue in which both sides may have defensible positions. Given its contentious nature, individuals with differing perspectives may hesitate to voice their opinions on social media. Therefore, we chose this issue for our study Respondents were provided with a definition of racial inequality before taking the survey. The participants were also asked to provide some basic demographic information such as gender, age, income, and education. This inquiry was prompted by a prior study indicating that demographic distinctions could influence users' choices of social media platforms [43]. No sensitive personal information was collected.

Table 1
Demographic characteristics of the participants.

	n	%[a]	m	SD
Gender			**1.47**	**.50**
Male	183	52 %		
Female	165	48 %		
Education			**3.42**	**1.03**
Less than High School	7	2 %		
High School	68	20 %		
Some College	99	27 %		
Four Year College	124	36 %		
Terminal Degree (M.A., Ph.D., M.D.)	53	15 %		
Race			**1.65**	**.90**
White	217	61 %		
African-American	51	14 %		
Hispanic	64	18 %		
Other	25	7 %		
Age			**1.96**	**1.0**
18-24	134	39 %		
25-34	130	36 %		
35-44	59	16 %		
45-54	20	6 %		
55-64	7	2 %		
Above 64	1	0.2 %		
Income			**2.21**	**1.15**
Less Than 10,000	113	32 %		
10,000–39,999	113	32 %		
40,000–69,999	73	22 %		
70,000–89,999	32	9 %		
More than 90,000	19	5 %		

[a] The percentages were rounded up.

4. Main variables

Willingness to Express Opinion. The respondents were asked about their willingness to express their opinion on the issue of systemic racism as the study's key dependent variable. The variable was borrowed from Neuwirth and colleagues (2007) and adapted for social media. The respondents were asked to answer the questions below on a scale of 1 (Very Unwilling) to 5 (Very Willing).

> "Now think about your Facebook network; if the topic of systemic racism issue came up on Facebook, would you be willing to express your own opinion about it on Facebook?" (M = 2.78, SD = 1.28).

> "Now think about your Twitter network; if the topic of systemic racism issue came up on Twitter, would you be willing to express your own opinion about it on Twitter?" (M = 3.13, SD = 1.33).

4.1. Perceived affordances

The respondents answered a series of items for each affordance on a scale of 1 (strongly disagree) to 5 (strongly agree). The measures were borrowed from Ref. [21,44] and indexed together for each platform. See Appendix for the list of items.

Network Association. Five items were indexed for network

association (e.g., "communicating through this channel allows many members of our social network to be part of our interaction"): Facebook (M = 3.80, SD = 0.67; α = 0.77) and Twitter (M = 3.50, SD = 0.78; α = 0.79).

Anonymity. Five items were indexed for anonymity (e.g., "this channel makes me anonymous to the person I am communicating with"): Facebook (M = 2.35, SD = 0.90; α = 0.84) and Twitter M = 3.50, SD = 0.94; α = 0.88).; Social Presence. Four items were indexed for social presence (e.g., "this channel makes it seem like the other person is present"): Facebook (M = 3.02, SD = 0.86; α = 0.86) and Twitter M = 2.51, SD = 0.91; α = 0.90).

4.2. Other variables of interest

Contextual Fear of Isolation. "Contextual fear of isolation" relates to both the issue and the audience. The items were borrowed from Neuwirth and colleagues (2007, p.457) and adapted for social media settings. We ran an exploratory factor analysis, and three items loaded together. These items were indexed to create contextual fear of isolation variable for each platform, Facebook (M = 2.60, SD = 1.13 α = 0.86) and for Twitter (M = 2.1, SD = 1.0 α = 0.85).

In our study, opinion congruence, communication apprehension, issue importance, and issue knowledge were included as control variables. These variables were considered important factors that could potentially influence the relationship between fear of isolation, platform affordances, and online self-expression (Gearhart & Zhang, 2014).

5. Results

The study's primary objective was to examine the impact of perceived affordances on users' willingness to express opinions on two social media platforms, Facebook and Twitter. Two hierarchical regression models were conducted to evaluate the hypothesized relationships, with one model dedicated to examining expressions on Facebook and the other model focused on expressions on Twitter. The Facebook and Twitter regression models comprised two discrete blocks of variables. The first block included sociodemographic variables (race, gender, education, income, age), social media platform use, contextual fear of isolation, issue importance, issue knowledge, communication apprehension, U.S opinion congruency, and platform (Facebook/Twitter) opinion congruency. The second block included perceived affordance variables — network association, anonymity, and social presence.

5.1. Perceived affordances across platforms

Our paired sample *t*-test results revealed significant differences between Facebook and Twitter in terms of users' perceptions of the three affordances. According to the results, users perceived higher social presence $t\,(345) = 9.8, p < .001$ and network association $t\,(342) = 6.5, p < .001$ on Facebook versus Twitter. On the other hand, users perceived higher anonymity on Twitter versus Facebook $t\,(348) = -18, p < .001$ (See Table 2).

Table 2
Differences between facebook and twitter on perceived affordances.

	Facebook		Twitter		*t*-test
	M	SD	M	SD	
Social presence	3.02	.86	2.51	.90	9.78***
Anonymity	2.35	.90	3.50	.93	−18.0***
Network association	3.80	.65	3.51	.75	6.5***

*p < .05. **p < .01. ***p < .001.

5.2. Perceived affordances on facebook

Table 3 describes the relationships between independent variables and willingness to express opinions on Facebook. The spiral of silence and sociodemographic variables in block 1 accounted for a 32 % variance in willingness to express an opinion. Only age (B = −0.14, p < .01) was significantly related among demographic variables.

Contextual fear of isolation was found to have a significant negative relationship with willingness to express opinions on Facebook (B = −.36, p < .001), suggesting the contextual fear of isolation enhances self-censorship on the platform. In addition, communication apprehension was also found to have a significant negative relationship with willingness to express opinions on Facebook (B = −0.28, p < .001).

Block 2, comprising the three perceived affordance variables of network association, anonymity, and social presence, explains an additional 3 % of the variance in the dependent variable (ΔR2 = 0.03). No significant direct relationship was detected between these variables and willingness to express an opinion on Facebook.

Nevertheless, moderation analyses [45] revealed that all three interaction models exhibited statistical significance in the context of Facebook. For example, the negative relationship between contextual fear of isolation and willingness to express an opinion on Facebook becomes stronger when users perceive higher social presence (B = −.19, p.< 0.001) and higher network association (B = −0.14, p < .001). On the other hand, the direction of the relationship between contextual fear of isolation and willingness to express an opinion on Facebook was altered when users perceived high anonymity (B = .12, p < .001). Put simply, when users perceive a high level of anonymity on the platform, their apprehension towards isolation diminishes, leading to a higher likelihood of expressing their opinions on Facebook.

6. Perceived affordances on twitter

Table 4 describes the relationships between independent variables and willingness to express opinions on Twitter. The variables in block 1 accounted for a 32 % variance in the dependent variable (R2 = 0.032). Specifically, age (B = 0.12, p < .05), Twitter use (B = 0.16, p < .01), issue importance (B = 0.21, p < .001), knowledge (B = 0.27, p < .001), and Twitter opinion congruency (B = 0.32, p < .001) were positively related to users' willingness to express an opinion on Twitter. In

Table 3
Predicting interactive effects on one's willingness to express opinion on Facebook.

	Model 1	Model 2
Direct Effects		
Race	−.038	−.039
Gender	−.067	−.068
Education	−.061	−.054
Income	−.047	−.079
Age	.140**	.145**
Facebook use	.147**	.153**
FOI	−.364***	−.360***
Comm. Apprehension	−.287***	−.279***
Issue importance	.163**	.166**
Issue knowledge	.194**	.188**
U.S. Opinion Congruency	−.019	−.018
Facebook Opinion Congruency	.122	.112
Social presence		−.002
Network Association		.037
Anonymity		.114
Interactions		
FOI x Social presence		−.186***
FOI x Network association		−.144***
FOI x Anonymity		.120***
ΔR^2		.03
Total R^2	.32	.35

Note: FOI=Fear of Isolation *p < .05. **p < .01. ***p < .001.

Table 4
Predicting interactive effects on one's willingness to express an opinion on Twitter.

	Model 1	Model 2
Direct Effects		
Race	−.037	−.026
Gender	−.134	−.069
Education	−.129*	−.148*
Income	−.047	−.078
Age	.124*	.167*
Twitter use	.157**	.198**
FOI	−.103	−.103
Comm. Apprehension	−.233***	−.234***
Issue importance	.207***	.121***
Issue knowledge	.269***	.217***
U.S. Opinion Congruency	−.111	−.108
Twitter Opinion Congruency	.325***	.313***
Social presence		−.060
Network Association		.040
Anonymity		.252***
Interactions		
FOI x Social presence		−.084
FOI x Network association		−.049
FOI x Anonymity		.022
ΔR^2		.01
Total R^2	.32	.33

Note: FOI=Fear of Isolation *p < .05. **p < .01. ***p < .001.

addition, communication apprehension (B = −0.23, p < .001) was significantly negatively related.

Unlike the Facebook model, contextual fear of isolation was found to have no significant relationship (B = −0.10, p = .067) with the willingness to express opinions on Twitter. However, we found a significant negative relationship between communication apprehension (B = −0.23, p < .001) and willingness to express an opinion.

Block 2 explains an additional 1 % of the variance in the dependent variable (ΔR2 = 0.01). In terms of direct effects, network association (B = −0.04, p = .657) and social presence (B = 0.06, p = .425) were found to have no significant relationship. However, perceived anonymity (B = 0.25, p < .001) was found to be significantly positively related.

The moderation analyses did not elicit any significant moderation effects of the three perceived affordances. That is to say, none of the affordances moderated the relationship between contextual fear of isolation and willingness to express an opinion on Twitter.

7. Discussion

Underpinned by the SoS framework, this study examined perceived affordances between Facebook and Twitter. Consistent with our hypotheses, we demonstrate that across network association, social presence and anonymity, users perceive differing affordances between Facebook and Twitter. Additionally, connected to our research questions, the results show that perceived affordances differ in their moderation of fear of isolation between Facebook and Twitter.

Foundationally, our findings support the notion that social media platforms are heterogenous in nature and should not be considered uniform communicative environments. Although some studies conceptualize and investigate social media platforms as homogenous units, our study demonstrates the limitations of such methodologies, finding that varying platforms elicit differing affordances. As such, future investigations of social media platform affordances should differentiate between each platform (De Vito et al., 2017; Oz et al., 2023). In doing so, future studies will be able to more accurately investigate platform specific affordances and avoid conflating results between multiple platforms. This is likely to reduce the inconsistency of results and inference in the contemporary investigation of social media affordances (see, [6,10]; Neubaum, 2022; Wu & Atkin, 2018).

One primary contribution of our study relates to the role of perceived affordances within the SoS literature and their methodological application. Specifically, our analyses demonstrate that while platform affordances do not exhibit significant direct relationships with willingness to express opinion, they instead operate as moderators for contextual fear of isolation, which is the SoS's primary operationalized variable. As moderators of contextual fear of isolation, the affordances of network association, social presence and anonymity provide a more nuanced understanding of opinion expression, which reflects divergent network characteristics between platforms.

We found that network association, social presence and anonymity moderate fear of isolation on Facebook, but not on Twitter. On Facebook, while we found social presence and network association to increase fear of isolation and dampen opinion expression, we found anonymity to decrease fear of isolation and encourages opinion expression. On Twitter, we found no moderating relationship. Here, we argue that these findings are attributable to platform differences between Facebook and Twitter, which influence users perceived affordances. Specifically, we suggest network characteristics, which describe the types of other users that an individual curates to be encompassed within their individualized network structure, are particularly important in understanding why platforms elicit differing affordances. On Facebook, this is a user's 'Friends', whereas on Twitter it is those they 'follow' and those that 'follow' them.

For instance, when it comes to Facebook, individuals typically establish connections with their pre-existing relationships (relationship-based) [46], forming reciprocal friendship structures that enhance users' perception of social connectedness [47]. In contrast, Twitter's dynamics differ as following a person does not establish a mutual connection, and users tend to follow and be followed by strangers (community-based) [46]; Himelboim, McCreery, & Smith, 2013). As a result, users tend to have more close/strong ties on Facebook compared with Twitter [46–48]. Connectedly, more so on Twitter, users are likely to imagine their audience consisting of strangers, with weak proximal ties, largely unrelated to their close friends and family. Therefore, owing to the notion that fear of isolation is stronger among close friends than strangers [10,39], where contextual fear of isolation can translate into "fear of losing a real-world relationship" [49], network structuring likely heightens fear of isolation on Facebook compared to Twitter. Indeed, some studies argued that the direct link between one's real identity and online identity impacts their perception of affordances (De Vito et al., 2017). Also, previous research show that people tend to be more concerned about disagreements with strong/close ties than with weak/-distant ties [50]; Neuwirth, Frederick & Mayo, 2007). A recent study has revealed that individuals who utilize Facebook demonstrate a strong emotional attachment and perceive a significant social cost associated with their presence on the network. As a consequence, such individuals exhibit a decreased inclination to articulate dissenting opinions [8].

Our results support these previous findings by showing that users perceive higher network association and social presence on relationship-based Facebook than on community-based Twitter.

A similar logical inference explains the moderating role of anonymity on Facebook. Unlike both social presence and network association, which we found to increase fear of isolation and dampen opinion expression, we found perceived anonymity to moderate fear of isolation and opinion expression on Facebook. The result indicates that users who perceive higher levels of anonymity can overcome their contextual fear of isolation and become more willing to express opinions on Facebook. These results are consistent with the literature that suggests anonymity makes people comfortable expressing their views on controversial issues in online spaces [31].

Previous research has suggested that a lack of social cues and diminished social presence encourage people to express their views on online platforms more than in face-to-face interactions [51,52]. Our study indicates when people perceive high social presence and network association on an online platform, viz. Facebook, their opinion expression also resembles that of face-to-face communication [53].

Besides distinguishing the effect of perceived affordances, we found some other significant differences between Facebook and Twitter. Among these, the most noteworthy finding pertained to the influence of platform opinion congruency, which demonstrated a positive association with users' willingness to express opinions on Twitter, while no similar relationship was observed on Facebook. Again, differences in the nature of network ties between the two platforms may explain this result. Users on Twitter, compared with Facebook, are more likely to follow strangers (Chen, 2015), and these strangers are likely to hold interests and values similar to their own [54]. This makes platform opinion congruency a significant positive factor in enhancing the willingness to express online on Twitter.

Our key findings and their explanations have important theoretical, social, and policy implications. First, we contribute to both the SoS and platform affordances research by showing that different platforms affect users' willingness to express their opinion in quite different ways. On Facebook, contextual fear of isolation significantly reduces users' willingness to express themselves on controversial issues. This relationship is intensified by the perception of high network association and high social presence but reduced by the perception of high anonymity. On Twitter, the contextual fear of isolation does not significantly affect willingness to express online — nor do network association and social presence moderate the relationship. Anonymity, though, has a substantial direct effect on Twitter.

Second, our study illustrates why Twitter has, over the years, played a prominent role in the spread of online social movements — from the Arab uprisings [55] to Occupy [56] to #MeToo [1] to Black Lives Matter [2]. Research on digital social movements has moved on from concerns about "slacktivism" to examining the reasons why online platforms may enable or constrain "hashtag activism" [57]. Our study indicates that compared to Facebook, Twitter's perceived affordances and network architecture encourages users to express themselves on controversial issues — which are typically the focus of collective action.

Third, while the early rise of social media was expected to make it easier for users to express their opinions about controversial issues, that has not always been the case. Our study not only shows that differences in platform affordances play a role, but also distinguishes the set of affordances that enable or constrain opinion expression. Social media platforms can use our findings to reform their algorithms in specific ways that would allow users to be more comfortable in expressing themselves on controversial issues. For instance, Facebook can reduce contextual fear of isolation among its users by taking steps that enhance the perception of anonymity on the platform. Additionally, the identification of platform opinion congruency as a significant positive factor on Twitter offers insights for fostering inclusive discourse. Platforms can leverage this knowledge to design features that promote diverse perspectives, contributing to a more enriched online conversation environment. Finally, for organizations and community leaders seeking to foster online communities, our study highlights the importance of understanding platform-specific dynamics. Tailoring community-building strategies to align with the perceived affordances of each platform can enhance user engagement and contribute to the development of vibrant online communities.

8. Limitations and future research

Our findings should be interpreted cautiously, due to several limitations. First of all, we did not measure individual differences. However, individual differences may influence how users perceive social media affordances. Future studies can take characteristic traits into account to better understand users' perceptions of social media affordances. Additionally, we did not examine Facebook and Twitter infrastructure; instead, we focused on users' perceptions of these platforms regarding social media affordances. Studying these platforms' infrastructure in the future will allow us to gain a better understanding of opinion expression.

Another notable limitation lies in the relatively low weightage of the perceived affordance variables in explaining variance ($\Delta R2$). Although our chosen independent variables, including social media affordances, exhibit some level of influence on online expression, they do not fully account for the complexity of this behavior. The modest explanatory power suggests that other unexplored factors, such as individual differences, platform-specific features, or broader socio-cultural influences, may play significant roles in shaping online expression behavior. Thus, we recognize the need for a nuanced understanding of the factors that contribute to the willingness to express opinions in the dynamic online environment, and our study sets the stage for further exploration in this evolving field.

Future research also can build on our study to broaden our understanding of platform differences and their implications for willingness to express opinions online. For example, a number of platforms, such as Instagram, YouTube and TikTok, are primarily image- and video-based and thus differ from platforms like Facebook and Twitter in terms of what types of users they attract and what their users' experiences are on these platforms. Examining the antecedents of willingness to express opinions online on these platforms would be another vital contribution to the scholarship. It is also possible that users in different countries have different perceptions of platforms and affordances [58]. Comparative cross-national research can therefore shed further light on this subject. Future studies should also consider examining individual differences when investigating platform affordances for a more comprehensive understanding. Finally, more policy-oriented scholars can examine how these findings can enable social media platforms to bolster their compatibility with online self-expression.

The author's statement

The corresponding author of this manuscript, certify that the contributors' and conflicts of interest statements included in this paper are correct and have been approved by all co-authors. Dr. Mustafa Oz.

Data availability

Data will be made available on request.

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Appendix

Affordances Items (borrowed from Fox & Ewan, 2015, p.305).
Network Association. (5 items)
"This channel makes my relationships with other people visible."

"This channel makes it easy for others to identify other people I am connected to."

"This channel allows me to communicate with multiple other communicators."

"Communicating through this channel allows many members of our social network to be part of our interaction."

"Communication with someone through this channel makes our connection apparent to other network members."

Facebook (M = 3.80, SD = 0.67; α = 0.77) and Twitter (M = 3.50, SD = 0.78; α = 0.79).

Anonymity. (5 items)

"This channel makes me anonymous to the person I am communicating with."

"The channel allows people to remain anonymous or unidentifiable if they want to."

"When using this channel, I can take on another identity if I want to."

"This channel can mask my identity when communicating."

"When communicating through this channel, the receiver does not necessarily know it's me."

Facebook (M = 2.35, SD = 0.90; α = 0.84) and Twitter M = 3.50, SD = 0.94; α = 0.88).

Social Presence. (4 items)

"This channel makes it seem like the other person is present."

"This channel makes it feel like the person I'm communicating with is close by."

"This channel makes it feel like other people are really with me when we communicate."

"This channel allows me to determine if someone is really "there" when communicating."

Facebook (M = 3.02, SD = 0.86; α = 0.86) and Twitter M = 2.51, SD = 0.91; α = 0.90).

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