Social Media and Radicalization: An Affordance Approach for Cross-Platform Comparison

Heidi Schulze / Simon Greipl / Julian Hohner / Diana Rieger*

To accentuate which platform characteristics particularly foster radicalization and extremist dynamics, this contribution investigates the affordances of social media as delineated in contemporary literature, conducting a platform comparison encompassing Telegram, WhatsApp, and X (formerly Twitter). Based on a scoping review, 17 affordances identified from studies researching radicalization dynamics on social media were extracted and categorized. The most frequently mentioned affordances—anonymity, visibility, and collectivity—were then further analyzed concerning their contribution to radicalization and the radicalization potential of these specific platforms. The platform-comparative affordance discussion shows that, although in principle each of the three compared platforms can foster an environment conducive to radicalization depending on user intention and context or use, the specific characteristics of each platform necessitate a nuanced consideration. On one hand, it is imperative to discern affordances differentially along various dimensions when assessing their implications (e.g., internal vs. external visibility). On the other hand, it is beneficial to consider which affordances emerge from the actualization of other affordances. For instance, collectivity can result from the interplay of several affordances, such as interactivity and anonymity, and can be referred to as a meta-affordance. Furthermore, the analysis shows that platform branding and self-presentation not only affect platform architecture and affordances but also shape users' perceptions of the platform, thereby influencing the actualization of affordances. This was particularly noted in the literature for Telegram and increasingly for X. Specific assertions, nevertheless, are hindered by the conceptual diffusion of the affordance approach and a lack of empirical analyses directly and systematically examining platform affordances in conjunction with radicalization dynamics.

Key words: radicalization, affordances, social media, anonymity, interactivity, visibility, collectivity

1. Introduction

Social media have long been central to the implementation of political goals by a wide variety of actors who employ the reach of social media to manipulate public discourse (Hohner et al., 2022), to mobilize (Johns, 2017), to distribute misinformation and propagan-

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da (Baker, 2022), or even to incite violent behavior (Marcks & Pawelz, 2022). In fact, radical and extremist actors have been using the internet's opportunity structures since its earliest commercialization in the 1980s (Conway, Scrivens, & McNair, 2019). In parallel, detrimental consequences for society can be observed globally: extremist violence is on the rise, the lethality of attacks has risen by 22 percent in 2024 (IEP, 2024), and far-right electoral wins bear witness to their growing political and structural influence (Beirich & Via, 2022). However, most studies of extremist communication and radicalization dynamics online have so far focused either on a single aspect of online communication, such as propaganda (Rieger et al., 2017), a specific platform like Telegram (Schulze et al., 2022), or qualitative interviews with former extremists (Baugut & Neumann, 2020). The majority of radicalization studies conclude at a very basic, unspecific level that *the internet matters* (Gaudette, Scrivens, & Venkatesh, 2022), functioning as a *catalyst* for radicalization dynamics (Abay Gaspar et al., 2020).

To better comprehend the 'role of the internet' in societal processes and radicalization dynamics, it is necessary to differentiate spaces, modalities, technical features, and their potential contributions to societal, group, and individual dynamics in digital environments. The high volatility of social media and their users, as well as the rapid changes in platform architectures, render coherent research difficult, and research results are sometimes quickly outdated or even obsolete. For this reason, there is an increasing call for cross-platform study designs to achieve more comprehensible explanations of how different spaces, modalities, or features affect societal dynamics (e.g., Kakavand, 2024; Wilson & Starbird, 2021). The affordance concept offers a useful approach to systematically elucidate the interaction of platform functionalities and the resulting services for users (Evans et al., 2017), evaluating their relevance in potentially democracy-detrimental dynamics. Against this backdrop, the present study examines the extent to which research on radicalization has thus far applied the affordance concept.

Based on a scoping review, we performed a platform-related reflection on the features and resulting affordances of three social media platforms highly relevant to radical and extreme discourse. We included the hybrid instant-messaging platform Telegram, which has been shown to contribute to radicalization dynamics (Buehling & Heft, 2023; Schulze et al., 2022; Zehring & Domahidi, 2023). Additionally, we included WhatsApp as a classical instant messenger and a more enclosed communication space, as well as X (formerly Twitter) as an open, public-oriented platform that has transformed significantly since being taken over by Elon Musk, especially in regard to the amount of radical or extreme discourse that is published on it (Miller et al., 2023).

Overall, this paper seeks to contribute to the theoretical and empirical advancement of social media, particularly in terms of their significance for radicalization dynamics. The objective is to inform future cross-platform and comparative research by (1) summarizing the current state of research on the specific relationship between features and resulting affordances, (2) illustrating the features of individual platforms and the affordances that may contribute to societally concerning consequences, namely radicalization dynamics, and (3) identifying potential research gaps to encompass cross-platform properties. Overall, this paper advocates for more frequent inclusion of the concept of affordances in research on the impact of social media. It also contributes to scholarly debate on the effectiveness of the concept of affordances and its empirical application for facilitating cross-platform research. The contribution concludes with a critical reflection on the possibilities, as well as the challenges, of using the affordance concept for social media research.

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2. Theory of Affordances in Social Media Research

The term *affordance* and its conceptualization were developed by the psychologist James J. Gibson (1979: 127) to describe and empirically measure the relationships between organisms (i.e., humans and animals) and their environment: "the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill [...] It implies the complementarity of the animal and the environment." The fundamental idea is that the respective environment, depending on the organisms' capabilities, determines the use and possibilities of use, thereby shaping perception. Due to the versatile application of this fundamental idea, the concept has not only evolved in psychology but has also been adopted and adapted by other disciplines, such as human computer interaction (HCI) research (Norman, 1988), and more recently in social media research. However, as a consequence of the numerous adaptations across different disciplines, the concept has become diffuse leading to various definitions and conceptualizations that, while sounding similar, yield different results (Ronzhyn et al., 2022).

In social media research, the adaptation of the framework developed by Evans et al. (2017) has gained prominence. They define affordances as "possibilities for action [...] between an object/technology and the user that enables or constrains [or invites] potential behavioral outcomes in a particular context" (Evans et al., 2017: 36*; brackets added by authors*). Consequently, the affordances of social media describe the possibilities for users arising from the *technical* features and design decisions made by website operators and platform companies for information dissemination, communication, and networking, which is why social media affordances are also often referred to as technology affordances (e.g., Panda et al., 2020). This term illustrates an advance of Gibson's notion by stressing that affordances can be purposefully designed into objects inviting specific users' behaviors, but still, it "is the interpretation which makes of the technology what it is" (Hutchby, 2001: 13).

Ronzhyn and colleagues (2022: 14) refine the definition by Evans et al. (2017), incorporating various dimensions of the affordance concept: "Social media affordances are the perceived actual or imagined properties of social media, emerging through the relation of technological, social, and contextual, that enable and constrain specific uses of the platforms." Affordances are thus "perceived actual or imagined" possibilities for use that "enable and constrain specific uses"of a platform or its functionalities, meaning they are not necessarily utilized and may vary according to individual and cultural contexts. Although Ronzhyn et al. (2022) are arguably more precise in their wording by considering imagined affordances as perceived, most research generally uses the terms perceived and actualized affordances for differentiation purposes (Ostern & Rosemann, 2021). The possibility for use is central to many definitions, such as that of boyd (2010), and particularly prevalent in publications written in English: the suffix -(a)bility is often added when naming affordances (e.g., "scalability" in boyd, 2010, or "visibility" in Treem & Leonardi, 2013). Affordances are situational and context-dependent ("technological, social, and contextual") and simultaneously specific ("specific uses"), so general actions like communication are not considered affordances.

Finally, relationality ("emerging through the relation") stands out as one of the most crucial characteristics of affordances, indicating that they are not inherent to the platform itself, its features, or the characteristics of an individual, but rather are a result of the interaction of the platform and the individual. The same feature can unfold entirely different affordances relative to the user and his/her skills or traits. Conceptually, it is essential to distinguish between a platform feature and a platform affordance: a feature can enable a multitude of affordances, and an affordance can emerge from various features. Typical

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features of social media include, for instance, following, sharing, and commenting, which enable the affordance of *interactivity* (Evans et al., 2017).

Interpretations of whether something qualifies as an affordance diverge significantly depending on the discipline and the authors. Some researchers, further distinguish between different orders of affordances, such as first- and second-order affordances or meta-affordances. For example, Abdalla Mikhaeil and Baskerville (2024) argue that a second-order affordance can be enabled by a combination of an actualization of several first-order affordances. In a similar vein, Prakasam and Huxtable-Thomas (2021) and Poddiakov (2018: 4) speak of a meta-affordance when referring to an affordance "of a higher order (level) that affords affordances of lower levels".

The multilevel character of affordances contributes to the complexity of the affordance concept, but it can also be considered a strength, particularly in social media research. Given the highly dynamic nature of user characteristics, the technical design of social media and usage contexts, the affordance concept establishes an overarching framework for the theory-driven exploration of platform dynamics and their relevance in societal dynamics. While the ephemerality of platforms, or at least the volatility of features and the increasing convergence of social media, pose a central challenge to more enduring and longitudinally platform-specific affordance research, the concept nonetheless holds particular value because it extends beyond the isolated examination of individual platform features (supply) or usage practices (demand). It enables platform-independent or cross-platform statements about online dynamics (e.g., Theocharis et al., 2021; Yarchi et al., 2020), thus deepening our understanding of how digital spaces, modalities, or features influence societal, group, and individual dynamics.

3. Platform Affordances and Radicalization

The relational nature of affordances implies that they are always context-specific (Treem & Leonardi, 2013), as the conception or implementation of a usage possibility is contingent on external conditions. To establish a suitable theoretical framework and align with the current focus of social media research, this paper focuses on political radicalization dynamics suspected of undermining the functioning of liberal democracies.

Current scholarship reflects a plethora of definitions and operationalizations of *political radicalization* (see Abay Gaspar et al., 2020, or Schmid, 2013, for in-depth discussions). But in essence, we can consider radicalization as

> "the growing challenge to and disapproval of a political system's order potentially accompanied by an incremental propensity for violence as a means to an end. What constitutes a *system* in this context is not necessarily country- but rather culture- or norm-specific, though these are usually interdependent. When studied in or in relation to democratic contexts, radicalization is considered a detrimental process and is often linked to an incremental acceptance of extremist ideologies or at least increasing illiberalism towards (perceived) political opponents." (Schulze, Rothut, & Rieger, forthcoming)

Radicalization dynamics can be considered an expression of underlying societal conflicts (Schmid, 2013) and can unfold and therefore be studied across different dimensions: individual, collective, or discourse. Individual-level radicalization research studies which types of personal characteristics and socialization instances contribute to radicalization trajectories. On the collective level, we can distinguish between intragroup radicalization, where group members converge against a (perceived) threat from outside, and intergroup radicalization, involving the radicalization of opposing extremes, also referred to as reciprocal radicalization. On the discourse level, research can focus on changes in events and

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public discourse to observe societal dynamics that might hint at or foster radicalization dynamics (e.g., crises) (Schulze, Rothut, & Rieger, forthcoming).

In online environments, research can observe extremists' behaviors and communication strategies, as well as (changes in) communication styles. Operationalizable manifestations of radicalization and well-known constructs, such as propaganda, hate speech, or mainstreaming can be used to elucidate radicalization dynamics in and through online environments (Marwick et al., 2022; Schulze et al., 2022). In recent years, the relevance of online environments has increased for extremist actors and online radicalization. Not only is there a growing presence of online-born or at least online-driven transnational subcultures and social movements, such as Incels (Brace et al., 2024) and QAnon (Hughes, 2022), but there are also initial empirical results of convicted extremists who have (self-)radicalized online (Kenyon et al., 2023). Extremists are highly adept at exploiting online opportunity structures to their advantage. They aim to recruit new supporters, mobilize existing ones, instill violent behavior, monetize their activities, and distribute their narratives in a manner that integrates them into the general discourse. Today, there are alternative online ecosystems based on ideologically reframed narratives, encompassing all possible dimensions, such as alternative information sources (e.g., hyperpartisan and alternative media), entertainment (e.g., memes, gaming, music), and even dating apps as well as social media platforms.

However, when examining how extremist activism leads to radicalization, the majority of radicalization studies conclude at a very basic, unspecific level that the internet functions as a catalyst for radicalization (e.g., Abay Gaspar et al., 2020). We argue for a more nuanced approach to studying which aspects of online communication, particularly social media, influence radicalization. The affordance lens offers a promising approach to better comprehend the "role of the internet" in societal processes and radicalization dynamics by enabling a more nuanced discussion of how to differentiate spaces, modalities, technical features, and their potential contributions to societal, group, and individual dynamics in digital environments. Social media provide an environment to directly engage in societal conflicts and potentially amplify the visibility of smaller conflicts, thereby increasing their perceived relevance (e.g., Törnberg, 2022). In the affordance logic, societal conflicts, radicalization, and resulting behavior are understood as outcomes of affordance actualization (Evans et al., 2017: 40). Based on this argument, this contribution first broadly asks:

RQ1: What role do social media affordances play in radicalization research?

To sharpen the focus of inquiry, a platform comparison is conducted. This enables reflection on both platform-independent and platform-specific affordances. Three different platforms are compared, each presenting different (though overlapping) feature repertoires and platform identities, which enable varying degrees of publicness and that have been researched and considered relevant in the context of radicalization dynamics. We include Telegram, currently one of the most relevant platforms for extremist communication (e.g., Urman & Katz, 2022) which particularly focuses on presenting an image of free speech. It enables high degrees of anonymity paired with very little content moderation. When several platforms, such as Facebook and YouTube, began intensifying their content moderation efforts by deleting extremist content and accounts, Telegram became known as a *safe haven* for these deplatformed actors (Rogers, 2020; Schulze, 2021). In addition, its hybrid platform architecture presents an interesting feature repertoire (Jünger & Gärtner, 2020) that allows "the distribution of propaganda and recruitment of new activists via (semi-)public channels, in which only the administrators can publish, while at the same time and within the same communication environment, (closed) groups and private chats support the planning of activities, including (terrorist) attacks" (Schulze et al., 2022: 1108). We further incorporate WhatsApp as one of the globally most used classic instant messengers, which

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presents a relatively closed communication space. It is also comparatively safe in terms of its end-to-end encryption.[1] Finally, we also focus on X (Twitter), a microblogging social network and highly open platform with great relevance for public discourse. X, like Telegram, presents a particularly interesting case for affordance-related platform comparison given its renewed relevance in radicalization research following the takeover by Musk, which resulted in the relaxation of content moderation policies and the substantial "replatforming" of prominent far-right and conspiracy figures (Miller et al., 2023). Thus, the second research question is as follows:

RQ2: To what extent do social media affordances affect radicalization dynamics when comparing the platforms X, WhatsApp, and Telegram?

4. Method: Scoping Review

Considering the aim of this paper and the open research questions, which are intended to present an initial overview of the current state of the scholarship and suggest a novel approach to discussing the role of social media in radicalization research in a differentiated manner based on the affordances concept, we decided to undertake a scoping review of the literature on social media affordances and radicalization. Scoping reviews are best suited for systematically mapping the existing literature on a specific topic. The research design and the subsequent descriptions follow, in principle, the PRISMA extension for scoping reviews (Tricco et al., 2018). Conducted in August 2023, the scoping review was based on Boolean keyword[2] searches across four different literature databases, namely ACM Digital Library, Communication and Mass Media Complete, Web of Science Core Collection, and Google Scholar. The database collection considered all publications up to the end of July 2023. Figure 1 provides an overview of the various steps of the review process and the respective search terms used. More detailed information on the scoping review process (Appendix A) and complete lists of references (Appendix B) are available in the online appendix at https://osf.io/e4536/.

During the database collection, we reviewed all available peer-reviewed, English-language literature on radicalization and extremism, focusing on the affordance concept with an emphasis on social media. After removing duplicates, the original corpus comprised a total of 1625 entries. Using the ASReview LAB tool (ASReview LAB developers, 2023) to facilitate and expedite the process, all abstracts of these entries were read and manually checked to determine whether 1) radicalization avenues were examined, and 2) titles and/or abstracts used the affordance concept to approximate the conceptual relevance of the affordance concept in the respective publication. This initially resulted in a total of 51

1 Over the course of the review process of this paper, WhatsApp and Telegram added new powerful features relevant to this study. WhatsApp incorporated a new feature called *WhatsApp channels*, seemingly very similar to Telegrams broadcast channels (WhatsApp, 2023). Telegram, known for not presenting algorithmically curated content, introduced a new feature that suggests channels to the users.

2 The keyword selection (affordance* AND) aimed to focus the review corpus on the affordance concept. It can be assumed that there is literature concerned with the specific affordances (e.g., anonymity) and social media related radicalization research that does not explicitly refer to the affordance concept by name. However, a pre-study that exemplarily included specific affordances as keywords without an explicit link to the affordance concept presented almost no relevant, in-depth literature in the context of social media related radicalization research. Still, to account for this limitation, we iteratively reviewed the references lists for possibly missing literature and added further papers to the review corpus.

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relevant publications, whose full texts were examined for the use of affordance definitions and entities referred to as affordances. During this step, five texts that, upon close inspection, were deemed irrelevant were deleted from the list. Simultaneously, eight additional relevant, peer-reviewed publications were extracted from the paper texts and references and included in the list. Once this iterative process was finalized, all findings were recorded in a table. All included texts were examined for the presence or absence of several aspects, including the definition of the term *affordance*, specific affordances addressed, platform(s) mentioned/studied and, ideology. These steps already revealed a certain "buzzwording" of the affordance term, as 17 texts mentioned the term but did not specify any particular affordances.

Ultimately, from a total of 54 texts, affordances were extracted which largely corresponded to the outlined criteria and were categorized into 17 affordances (see Table 2 in Appendix B). A quantitative count without prior categorization was not feasible, as the texts used various terms for similar affordances. For this reason, the most frequently mentioned publications and conceptualizations by boyd (2010), Treem and Leonardi (2013), and Evans et al. (2017) were used to create an initial list of relevant affordances: anonymity, association, editability, interactivity, persistence, replicability, scalability/visibility, and searchability. The affordances mentioned in the publications were classified according to this initial list when the presentation in the publication matched the affordance. Any affordance that could not be accordingly classified was added as a new affordance to the list. After an initial presorting by the lead author, there was an iterative critical revision of the categorization involving all co-authors.

The affordance categorization showed that three affordances in particular—*anonymity*, *collectivity*, and *visibility*—were far more frequently mentioned than other affordances in the analyzed literature. Therefore, we decided to focus the discussion of the second research question on these specific affordances, to enable a more narrowed and in-depth discussion. When analyzing and discussing the related texts and affordances, it became necessary to include further literature that generally defined the specific affordances, even if not directly related to radicalization. This was because specific affordances are rarely defined or further explained in terms of their role in radicalization processes. Figure 1 explains the process in detail and explains at which step in the process the literature was added to support responses to the research questions.

Furthermore, to better account for the feature-affordance relation and to augment the platform comparative affordance discussion addressing research question two, we extensively, but non-systematically (for a systematic approach see Van Raemdonck & Pierson, 2021), explored the three platforms of interest (Telegram, WhatsApp, X) to extract the affordance-specific platform features. The results of this feature collection, which focused on the most apparent and obvious features, were summarized in two tables (one each for anonymity and visibility) and added to the results section. It must be noted that the platform changes and platform convergence (in terms of copying successful features) pose a challenge to the affordance approach because, with changing platform feature compositions, the affordances also change. The affordance-related feature collection was conducted in March 2023 and updated in February 2024. While we did account for the feature changes during this period, we did not find affordance- or radicalization-related publications that empirically addressed these features which is why the relevant changes are only briefly addressed in the results section.

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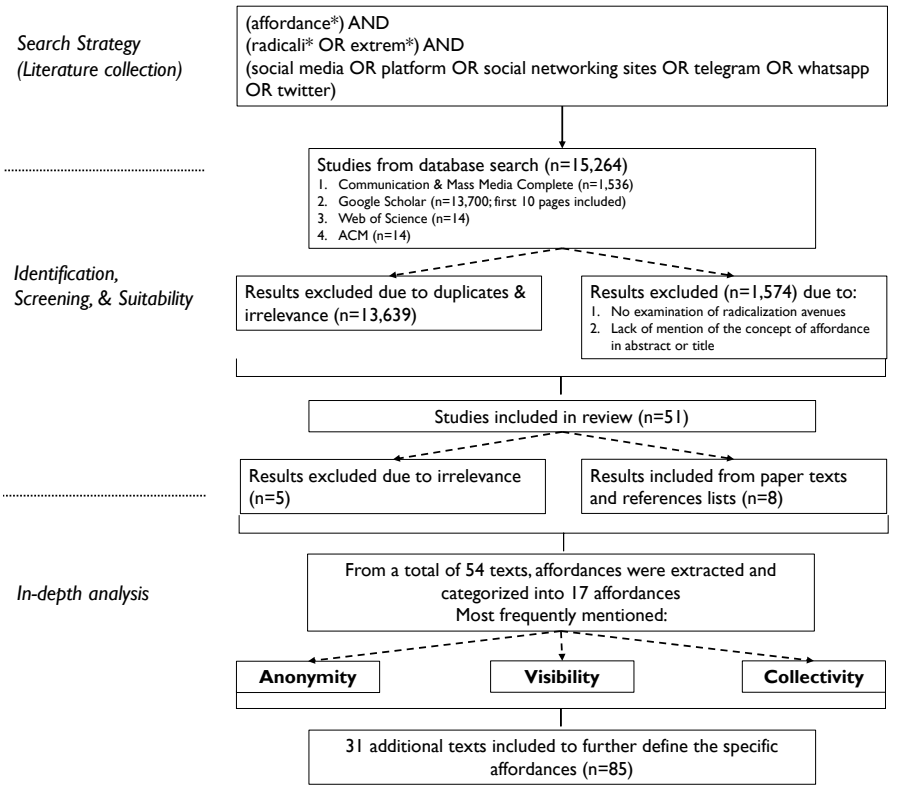
Figure 1: Scoping Review Process



5. Results

5.1 Social Media Affordances in Radicalization Research

The large number of entries extracted from the literature databases (N = 1,625) underscores how frequently the concept of affordances is associated with social media in research on radicalization. Beyond that, the temporal distribution of publications reveals that the social media affordances approach to radicalization research is a rather new phenomenon, since the oldest paper in the sample was published only in 2015 which—since coinciding with an extraordinary leap in social media radicalization research in general (Rothut et al., 2022)—seems most likely to be attributable to an increasing interest in radicalization dynamics online. Since 2015, the number of publications has steadily risen, which has highlighted the increased relevance of affordances in research on radicalization. However, the considerable reduction in publications through relevance verification (n = 54), along with the limited number of publications that explicitly define *affordance* (n = 18) and specify particular affordances (n = 30), suggests that in-depth engagement with the concept is rare within social media related radicalization research. The affordance concept is often only used as an auxiliary means to explain the relationship between using social media and the dynamics of radicalization and extremism.

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Those trends would not be problematic if the literature analysis did not also reveal that the concept of affordances has been applied in divergent ways, with interpretations of Gibson's (1979) original concept sometimes varying significantly. For instance, definitions of *affordances* articulated by Ben-David and Fernández (2016), as well as Peeters and Willaert (2022), focus on technical features while neglecting the central element of perceived possibilities for action (Evans et al., 2017). Such divergences or omissions in definitions can lead to discrepancies in the concept's operationalization, such as labelling classic platform features such as the "Like" button (Munger & Philips, 2022), but also the outcomes of affordances, including *trust* (Evangelista & Bruno, 2019), as affordances. Although publications adopt classic definitions of *affordances* in their conceptualizations, they sometimes operationalize those definitions in the form of features (e.g., Wang & Sundar, 2022) or blur the lines between features, affordances (e.g., Clever et al., 2023), and outcomes.

In total, 30 publications mention or discuss specific affordances, a subset of which (n = 6) does not distinguish affordances from features. The extraction of proposed affordances reveals a stable inventory of established affordances, primarily drawn from foundational literature, including persistence (boyd, 2010; Treem & Leonardi, 2013; Evans et al., 2017) and visibility (Treem & Leonardi, 2013; Evans et al., 2017). It also illustrates that many publications employ or summarize general complexes of affordances, including *dark technological affordance* (Copland, 2021) and *encryption affordances* (Gursky et al., 2022), as conceptual frameworks, thereby reducing the complexity of classifying affordances. Furthermore, many publications identify novel, less established affordances, often denoting various terms for similar or identical possibilities for action. Those diverse terms have been categorized into 17 affordances based on their contextual meaning in the text (see Appendix B). The most frequently mentioned social media affordances in the radicalization literature were *anonymity*, *visibility*, and *collectivity*, as discussed in detail in subsequent sections.

The analysis of the examined platforms revealed that a significant portion of the publications (n = 39) focused on at least one specific platform. However, only a small fraction (n = 6) leveraged the advantages of the affordance concept for a comparative or cross-platform discussion. In total, 14 different platforms were examined (see Appendix B). Most papers studied Twitter (n = 21) which can possibly be explained by its high relevance for public discourse and simultaneous data accessibility until at least 2023. In contrast, other platforms, even large ones, are far less frequently addressed: Facebook (n = 9), YouTube (n = 7), Instagram/Reddit (n = 6). While instant messaging platforms, such as WhatsApp (n = 5) and Telegram (n = 4) also seem to be relevant, smaller platforms that are suspected of fostering radicalization and extremist dynamics are rarely discussed in light of the affordance concept. For example, Gab, 4Chan, and 8Chan are included only once (8Chan) or twice (Gab, 4Chan) in the sample of examined publications, possibly because their fringe character and peculiar platform architecture increase the complexity of applying the affordance approach.

5.2 Excursus: Interactivity as a Multilevel Affordance

During the process of affordance categorizing, the conceptual diffusion mentioned above, the overlap of affordances, and the near impossibility of precisely distinguishing or demarcating distinct affordances emerged as a central challenge not only for the affordance-based approach in general, but also for the discussion in this paper in particular. On the one hand, it is possible to employ the approach for a nuanced, differentiated discussion of different platform features and what they afford to users, as we show in the next two sections on the affordances of *anonymity* and *visibility*. On the other hand, situating affordances on different levels (e.g., first-order vs. second-order affordances) and accounting for how they

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are interlinked and influence each other allows for a broader perspective that considers the actual interdependencies and complexities at play. That possibility became apparent when scrutinizing the affordance of collectivity that fundamentally relies on the actualization of other affordances, especially interactivity.

Interactivity, despite its seemingly intuitive nature, is a complex and multifaceted concept. As a fundamental element of Human-Computer Interaction (HCI), the development of interactivity gained significant traction in the 1990s, during which factors related to media and psychology were thoroughly discussed and differentiated by object emphasis (e.g., technology, communication setting, and perceiver) and disciplinary perspective (Kiousis, 2002). These discussions underscore the intricate nature of interactivity on a broader conceptual level. Because there is no overarching definition of *interactivity* as an affordance of social media, at least according to our research,[3] we have followed Kiousis (2002: 372), who, after a detailed discussion of various definitions, writes:

> "Interactivity can be defined as the degree to which a communication technology can create a mediated environment in which participants can communicate (one-to-one, one-to-many, and many-to-many), both synchronously and asynchronously, and participate in [reciprocal message] exchanges (third-order dependency). With regard to human users, it additionally refers to their ability to *perceive* the experience as a simulation of interpersonal communication […]." (square brackets added by authors of this paper)

In the context of interactivity as a social media affordance, the notion of "reciprocal messages" can be conceptualized more broadly, not only given the array of platform features beyond messages that afford interactivity but also because affordances are based on perception.

Within the affordance-based approach, we propose interactivity as a multilevel affordance. When considering interaction as the core activity on social media and the reason for its existence, interactivity can be understood to function as *the* basic affordance in the actualization of all other social media affordances. Each instance of interactivity is specified by other affordances, including anonymous interactivity, which necessarily actualizes interactivity. Depending on the procedural context, it can also encompass more complex or abstract affordances, such as collectivity. All these elements are embedded in a complex, interactive system (see Figure 2). However, interactivity can also be regarded as a typical social media affordance, as done in most publications on affordances, in terms of a perceived possibility for interaction with different degrees of interpersonal meaningfulness (e.g., exchanging holiday pictures with family members vs. retweeting a news article). The complexity of the degree of interpersonal meaningfulness can be further illustrated in terms of social media influencers and parasocial interactivity: "Although parasocial interactions do not entail real interactivity, they can foster feelings of safety and friendship" (Frischlich et al., 2022: 10). Finally, interactivity can be studied as a higher-order affordance when arising from the actualization of other affordances, for instance, when a terrorist attack is being planned, anonymity enables interactivity.

3 Most publications on affordances do not explicitly define *interactivity* according to its function as a social media affordance but only mention aspects of it or features linked to interactivity (e.g., Wang & Sundar, 2022).

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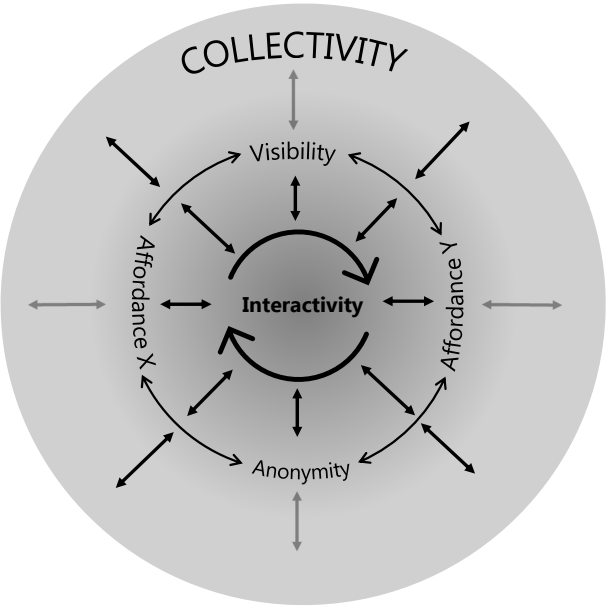
Figure 2: A Simple Reciprocal Scheme of Affordances on Social Media



Note. Interactivity is a multilevel affordance that can function as a regular (perceived) affordance, but also as a basic affordance that only when actualized enables the actualization of other affordances, thus creating a quasi-interdependence of mutual influence.

5.3 Anonymity

Various definitions and conceptualizations exist for the terms *anonymity* and *anonymous communication*, as demonstrated in Scott and Rainss (2020) overview. For instance, *technological anonymity* describes the absence of social cues or signals (e.g., facial expressions, gestures, and information about social context) in mediated communication. *Social anonymity*, by contrast, describes how individuals perceive themselves as being anonymous, for example, while sitting at home alone in front of a laptop (Christopherson, 2007). That social aspect of anonymity also refers to the perceived (un)identifiability of one's social identity according to, for instance, profile indicators. *Personal anonymity*, in rather general terms, describes a real person's (un)identifiability (Christopherson, 2007). Overall, anonymity is usually regarded as a continuous construct (Scott & Rains, 2020). For that reason, even personally anonymous individuals (e.g., users of pseudonyms) may exhibit reduced social anonymity through social cues, for instance, presenting political affiliations such as #noafd (Crosset et al., 2019). Platforms differ regarding the degree to which they enable anonymity. At the extreme, "dark" and "brackish" platforms even oppose means of surveillance by offering technological affordances developed to hinder openness (i.e., viewability) and thereby contribute to anonymity (Copland, 2021) by allowing users to speak freely on the platforms.

For radicalization, online anonymity emerges as a central technological avenue, particularly for extremist actors (Holt & Bolden, 2014). In anonymous communication, more radical viewpoints and hate speech find expression (Halverson & Way, 2012), which allows experimentation with extremist ideologies online free from the immediate social

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consequences commonly experienced in offline contexts (Corb, 2015). For instance, Hughes (2022) has described the spread of conspiracy groups such as QAnon as being facilitated by the affordances of message boards such as 8chan/8kun and how anonymity contributes to creating a "mass anonymous exegesis" and "anonymous collectivity" (12).

A framework for explaining the association between anonymity and radicalization is the online disinhibition effect (Suler, 2004), which involves perceived anonymity's potential to disinhibit. Disinhibition occurs when anonymity prompts online behavior that would normally be inhibited in face-to-face situations (Suler, 2004), among which "rude language, harsh criticisms, anger, hatred, even threats" (321) have been termed *toxic disinhibition*. Using Gab as an example, Jasser et al. (2023) argue that its affordances have enabled the development of a far-right community, a major driver of which continues to be anonymity. In their words, anonymity is associated with the formation of "stable, if anonymous user personas [...]. The combination of Gab's lack of content moderation and culture of anonymity helps to account for the prevalence of hate speech, violent fantasies and, more rarely, direct incitements to violence within our samples" (1738). Furthermore, when Eddington (2018) investigated the communicative constitution of hate organizations on Twitter, he found Trumps 2016 electoral campaign to be connected to far-right groups and hate groups via the use of the #MAGA hashtag, in a communicative pattern amplified and encouraged due to anonymity on the platform.

All three platforms in our comparison (i.e., Telegram, WhatsApp, and X) have put little effort into moderating content posted by their users, and such near-absences of content moderation are often associated with higher levels of (perceived) anonymity (e.g., Jasser et al., 2023). Platforms that afford a higher degree of personal anonymity tend to exhibit lower-quality political discussions (Oz et al., 2018) and reduced civility in interactions (Halpern & Gibbs, 2013). Perceived anonymity on X (Twitter), both personal but especially social anonymity, surpasses that on platforms such as Facebook given the less visible presence of established communities (Hameleers, 2020), which has been linked to various forms of extreme language (Sutch & Carter, 2019) that often achieve greater reach than less uncivil content (Panda et al., 2020). Meanwhile, WhatsApp allows the targeted, highly anonymous dissemination of misinformation, because individual closed groups can shield any overarching actor from viewing them (Chagas, 2022). On top of that, Telegram boasts the most features for personal anonymity, which has led to the extensive and escalating dissemination of radicalizing content, including conspiracy narratives and calls for violence (Schulze et al., 2022; Urman & Katz, 2022).

All three platforms—X, Telegram, and WhatsApp—would be broadly classified as affording similar, albeit different, forms of anonymity. Whereas Telegram's self-branding as well as its architecture contribute to a perception of high personal anonymity on the platform, WhatsApp is perceived as offering less personal anonymity due to its dependence on phone numbers and often clear relationships between the user's real name (and account verification) and contact list. By contrast, Telegram may offer less social anonymity than WhatsApp because Telegram users' membership to channels and groups is more visible and can indicate specific aspects of one's social identity. On WhatsApp, group memberships are less visible (i.e., only displayable as one's profile picture or in the brief self-description). Twitter (X), meanwhile, has recently shown shifts in self-branding, including lessened social anonymity due to followership and self-descriptions and because content is publicly visible. Although recruitment (e.g., first contact) and connective processes can be particularly pronounced on public platforms such as X, instant messengers such as Telegram or WhatsApp are conducive to the (less detectable) strategic dissemination of misinformation

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and propaganda. Thus, by enabling different forms of (perceived) anonymity, all three platforms can contribute to the dynamics of radicalization in different ways.

Table 1: Platform Features that Afford Anonymity

X (Twitter)	WhatsApp	Telegram
– Some content can be read without an account – Account creation possible without cell phone – Account verification via email mandatory	– Platform cannot be used without a cell phone – Account verification via SMS mandatory	– Only some content can be read without an account (open broadcast channels) – Use of the platform only possible with cell phone number – Account verification via SMS mandatory
– No real name required; handle & display name freely selectable – Personal details are not checked when the profile is created	– No real name required, display name can be changed, but linked to the contact's address book – Phone number is displayed – Access to cell phone address book must be permitted – Personal details are not checked when the profile is created	– No real name required, handle & display name freely selectable – Telephone number display can be deactivated – Personal details are not checked when the profile is created
– Contacting in principle with every profile possible – Findability & contactability restrictable – Blocking of profiles possible – Basic setting: all content open, anyone can interact (i.e., comment, follow, like, retweet)	– Contact via cell phone number or joint group membership – Findability of the profile cannot be restricted – Blocking of profiles possible – Admin display cannot be deactivated	– Contact via cell phone number, shared group membership or public user name – Findability & contactability restrictable – Blocking of profiles possible – Admin display cannot be deactivated
– Dual-factor authentication only in the payment model – So far no protection against third-party access during exchange through end-to-end encryption – Self-deleting posts – Cooperation with security authorities unclear	– Dual-factor authentication – Protection against third-party access during exchange through end-to-end encryption – Linking WhatsApp data with Facebook – Self-deleting messages – Cooperation with security authorities	– Dual-factor authentication – Protection against access by third parties during exchange through client-server/server-client encryption; additionally: "Secret chats" with extended end-to-end encryption – Self-deleting messages – Little cooperation with security authorities

5.4 Visibility

As a core feature of social media, *visibility*, or *scalability* (boyd, 2010), can be defined as the ability to extend reach in terms of individuals, collectives, and/or content. A nuanced distinction is drawn between *external visibility*, which facilitates broad public reach via digital means, and *internal visibility*, which fosters social and/or personal presence in online groups and discussions.

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Radical or extremist users seek out the external visibility afforded by a platform architecture encouraging open discussion and highly connected posts when aiming to spread disinformation and propaganda (Baker 2020) and/or mobilize for large-scale radical action (Johns, 2017). Van Haperen et al. (2023) have portrayed how local groups of Black Lives Matters adversaries coordinated their interests into synchronized actions through Twitter discourse about the movement. In such ways, problematic narratives, anti-democratic sentiment, and propaganda were widely disseminated as well (Chatfield et al., 2015) by infiltrating or being intertwined with mainstream discourses (Johns, 2017). According to Yarchi et al. (2020: 17), "Publicly open discussions [...] and public pages in particular often exist as instruments of political activism and other users respond to it as such." Especially X (Twitter), owing to its large user base and the public timeline, has allowed a notably high degree of external visibility. Permissive content moderation by the platform since being taken over by Elon Musk has further supported the dissemination of harmful speech and, in turn, radicalizing content on the platform (Miller et al., 2023). The vast potential to scale its content and infiltrate discourses, coupled with a lack of content moderation, has led X to become a go-to platform for external visibility and the spread of extremist narratives.

By comparison, external visibility on WhatsApp has been limited (Johns & Cheong, 2021), at least up until the introduction of WhatsApp channels in 2023. Because communication on WhatsApp occurs primarily in groups with a restricted number of users, the platform enables specific actors and content to be more visible across a more intimate space of recipients. Regarding the group function, Johns and Cheong (2021) argue that WhatsApp can selectively promote processes of radicalization and is particularly effective in rallying group members around a common purpose, as radicalization-oriented cues can be finely tailored to the audience. Added to that, Chagas (2023) posits that hateful memes on WhatsApp have been designed to present more explicit information and be more directly ideologically framed than memes on X, which instead has significantly more humorous content that obfuscates extremist intents. A case study by Evangelista and Bruno (2019) investigating limited but tailored information revealed that Jair Bolsonaro's administration in Brazil selectively monitored WhatsApp group chats to distribute misinformation during the 2018 electoral campaign, a tactic argued to have significantly contributed to visible radicalization within Bolsonaro's politics and among his followers.

The relatively high internal visibility of users on WhatsApp may support group-based pathways to radicalization, as they have been found to strengthen social bonds and homogenize the opinion climate within group chats (Kligler-Vilenchik et al. 2020). In support, Gil de Zúñiga and Goyanes (2023) found that WhatsApp users who used the instant messenger as a news source showed a negative association with political knowledge but, more crucially, a positive association with engaging in illegal protest. WhatsApp was thus found to be a platform that enables unlawful behavior in cases in which news consumption is based on smaller information networks with homogenized opinion climates and high internal visibility, including WhatsApp groups.

Telegram's hybrid platform architecture, due to enabling one-to-one, one-to-many, and many-to-many communication, provides more external visibility than WhatsApp but a similar degree of internal visibility. It is thus a flexible platform that affords both internal and external visibility. A chief driver of its hybrid information system is outlinking, not only within Telegram from one channel or group to another but also to websites outside of the platform, enabling the visibility of its content outside the channels that an individual directly follows (Brace et al., 2024). Gursky et al. (2022) characterize that system of forwarding messages as demonstrating cascade logic, by which content is trafficked upstream (i.e., from private to public) or downstream (i.e., from public to private). In those ways, regardless

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Table 2: Platform Features that Afford Visibility

X (Twitter)	WhatsApp	Telegram
– Newsfeed	– No newsfeed	– No newsfeed
– Algorithmically curated content based on user behavior, hashtags, & trending terms	– No algorithmic content display	– No algorithmic content display, but recently channel recommendations were introduced
– Increased external visibility by publishing tweets & interaction with others (e.g. liking or retweeting) – Links to other networks possible	– Increased internal visibility in the form of contact forwarding/sending group invitations via third parties or other networks – Increased internal visibility of channels by suggesting them under "updates"	– Increased internal & external visibility by forwarding posts, mentioning channel/group name in other channels/ groups & sending invitation links
– Creation of own communities' lists are allowed, but function more as own curation system than as collective community.	– Mainly closed groups & communities consisting of topic-based groups – Open groups visible via Google & portals such as Groupler.me based on topic keywords (joining the group is mandatory for viewing content & further interactions). – For viewing & interacting with content in channels it is not mandatory to join the channel	– Content of open broadcasting channels can be distributed beyond the platform (e.g. via dedicated aggregation websites); open groups only within Telegram; closed channels/groups only visible by joining
– Advertising (via Ads account)	– No advertising measures	– Contextual advertising possible in public channels with more than 1,000 members
– Minimal visibility as observing profile without interactions with other accounts; no posting of content on own feed; no similarity in profile name with celebrities/company names – Highest visibility as advertising profile; regular distribution of own content as well as interactions with third-party content & awareness-raising advertising measures; awareness indicator: obtaining the so-called "blue tick" (also available for purchase via third-party providers such as Blue)	– Minimal visibility as a profile interacting purely in a private environment without membership in public groups – Maximum visibility as a highly active profile; regular distribution of own content & acting as admin of large public groups, channels or communities with an active external presence in other social networks	– Minimal visibility as a purely private passive/active or anonymous passive profile in channels without membership in public groups – Maximum visibility as an advertising profile; regular distribution of own content & acting as an admin of large public channels, groups or communities with an active external presence in other social networks

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of whether a user follows radical or extreme accounts, the platform offers visibility for extremist propaganda (Krona, 2020), conspiracy narratives (Bühling & Heft, 2023), and terrorist content (Walther & McCoy, 2021).

Altogether, regarding the internal and external visibility of opportunities for radicalization, Telegram can be categorized as existing between the extremes of WhatsApp and X. The introduction of WhatsApp channels and the recommendation to follow similar channels on Telegram are noteworthy changes in their respective platform architectures in terms of affording visibility. However, because those features are relatively new, we found no peer-reviewed research that has analyzed its potential to generate additional visibility. Overall external visibility on Telegram is inherently limited, and users have to actively search for content and channels or groups. Otherwise, it shares many functionalities with WhatsApp regarding group-based communication aimed at enhancing the internal visibility of potentially extreme content within smaller groups. In sum, X is predominantly a platform for public outreach and for making contact with radicalizing or extremist content more likely, because it affords the most external visibility. The greater internal visibility on WhatsApp and Telegram, meanwhile, enables more targeted outreach, both for directly contacting and recruiting new supporters or, in small and/or closed groups, planning or mobilizing for (violent) action within their own ranks. Of the three, Telegram stands out as the most versatile platform due to affording a high degree of both internal and external visibility.

5.5 Collectivity as a Meta-Affordance

As a social media affordance, *collectivity* refers to ways for platforms to enable the building and maintaining of communities, which creates a collective identity-forming opportunity structure for users. Collectivity can be established through a combination of sociotechnical features that enable group creation and participation (e.g., creating channels, groups, or communities) along with features for their structuring and management (e.g., moderation, hierarchy, and privacy). By themselves, however, those attributes are insufficient to afford manifestations of collectivity (e.g., goal-oriented group behavior), including the discussion and dissemination of ideas, the coordination of collaborations, and collective action.

Collectivity depends on the emergence of perceived group dynamics. A simple example of how collectivity can differ appears on Telegram channels and groups, which vary specifically in terms of allowing one-to-one, one-to-many, or many-to-many communication and whether such communication is public and open or private and closed (Van Raemdonck & Pierson, 2021). Collectivity thus encapsulates how interactivity creates reciprocity. In that process, interactivity requires a minimum of timely or relational contingency. Collectivity can be regarded, for instance, as procedural (e.g., following rules of some kind; Murray, 1997), in which interactivity has to be meaningful enough for the user and peers to become translated into processes by which groups affirm and validate themselves. Collectivity therefore requires other affordances as a foundation, including their interaction and actualization, to create the necessary precondition. Given that complexity, we recommend considering collectivity as a meta-affordance.

How collectivity emerges through the actualization of other affordances can be readily illustrated. Anonymity in online spaces can enhance a sense of collectivity by encouraging individuals to align with the norms and identities of like-minded groups (Eddington, 2018). That process can be described by the social identity deindividuation effect model, which suggests that anonymity leads to the adoption of group-level behaviors (Postmes et al., 1999). Research by Rösner and Krämer (2016) has expanded that understanding by exploring how anonymity influences the adoption of aggressive language within such collective identities, such that hateful rhetoric becomes normative as a result of group-level

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affirmation, which underscores anonymity's role in shaping group dynamics. Furthermore, interactions such as sharing and commenting can be actualized into collectivity. The act of sharing serves to signal positioning and identity, while commenting additionally enables self-reinforcing feedback (Abdalla Mikhaeil & Baskerville, 2024). Sharing therefore contributes to the affirmation of the group, and dynamics of radicalization can arise as identity-driven escalations that involve the search and reinterpretation of new information within one's belief system (Lüders et al., 2022). Particularly relevant to and illustrative of that phenomenon is the sharing of clues related to conspiracy narratives; not only are they foundational to extremist ideologies and able to facilitate and indicate radicalization dynamics (Schulze et al., 2022), they also perpetuate identity-reinforcement and other processes of affirming the group by conflating both the problem and the proposed solution. On the one hand, harmful conspiracy narratives are constructed; on the other, affiliation with the enlightened group is reinforced through the sharing of conspiracy-related clues. Abdalla Mikhaeil and Baskerville (2024) have identified the significant potential for escalation and radicalization in the combination of other affordances—again, visibility—with the ability to reinforce shared social identities. Likewise, identity-based and reinforced intergroup differentiation prompted by social media may impact the biased perception of news media (Cooks & Bolland, 2021).

Despite newer, more explicit group functions, X primarily facilitates collectivity based on high visibility and indirect interactivity, for instance, for the purpose of mobilizing like-minded individuals. The retweet function allows opinion-based, competing groups to form in large assemblies (Vaast et al., 2017; Lüders et al., 2022). With hashtags, tweets, and comments, users can express their positions in an ongoing online debate and connect with like-minded individuals. Those dynamic interactions between users create new possibilities for the formation of social identities, including hashtag campaigns, but may likewise explain radicalization as a result of the emergence of (competing) social identities (Lüders et al., 2022).

Direct communication, as in WhatsApp groups, provides users with the opportunity to discuss shared perspectives and activities (Lüders et al., 2022). The group function is typically used to promote a common interest, which makes the groups more or less homophilic. Beyond that, private chat groups generally allow extremists to organize in entity-like virtual cliques (Valentini et al., 2020) or in a safe space (Johns & Cheong, 2021).

Along with (closed) groups as on WhatsApp, Telegram offers the possibility of creating (semi-) public channels. Because only administrators are authorized to publish on those channels, they represent a hierarchical form of communication (Van Raemdonck & Pierson, 2021), wherein collectivity arises in the context of processes of radicalization according to a leader-follower dynamic that can be used for propagandistic purposes. Telegram in particular may have capitalized on collectivity, specifically processes by which groups affirm themselves. First, by unifying public as well as private communication, Telegram seems to have evolved into an interactive platform for forming and strengthening ideological identities by reinforcing ideas of us versus them (Krona, 2020). That perspective is additionally flanked by the notion that Telegram may have benefited from creating an umbrella identity linked to the promise of anonymity that seemingly appeals to far-right actors: a supposed haven of free speech.

Collectivity empowers (online) groups to plan and engage in actions and dynamics that can be crucial in the context of radicalization and extremism. X creates ostensibly loose collectivities with high public visibility of competing social identities, thereby offering the strategic potential for extremists to manipulate the formation of public political opinion. By contrast, collectivity on instant messengers such as Telegram and WhatsApp, with partly

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semi-public, direct, and private-group forms of communication, offers flexible, effective group management that can be utilized to promote strong group identities. In particular, extremist actors strategically leverage such intimate group configurations for the purposes of recruitment and radicalization. Kronas' (2020) work showcases Telegrams functionality as a particularly useful tool for the strategic (communicative) practices of IS, namely by offering interconnectivity not only between official channels but also between official and supporter channels, as well as the decentralization versus centralization of the dissemination of information.

6. Discussion

To determine which characteristics of social media platforms particularly foster radicalization and extremist dynamics, we investigated the affordances of social media as delineated in scholarship on radicalization and social media affordances and conducted a comparison of three platforms: Telegram, WhatsApp, and X (formerly Twitter). Based on a scoping review, 17 affordances derived from 54 studies using an affordance-based approach to study the dynamics of radicalization on social media were extracted and categorized. The most frequently mentioned affordances—anonymity, visibility, and collectivity—were further analyzed with respect to their contribution to radicalization and the potential of the platforms to enable the radicalization of users.

The first research question asked, albeit rather broadly, what role social media affordances have played in research on radicalization. The literature review revealed that the concept of affordances has, since approximately 2015, been increasingly applied or mentioned in research on radicalization to scrutinize the role of social media more comprehensively. That increase has coincided with a general increase in research on radicalization using social media. However, compared with the overall body of literature on social media and radicalization reviewed by Rothut et al. (2022), the concept remains rarely applied. Even when included, most publications mention the concept only cursorily. Less than half of the included papers present a definition of *affordance*, and their interpretations vary. The resulting conceptual confusion poses a significant challenge to research on affordances, diminishing the comparability and generalizability of the results. Despite various publications on conceptualization, no consensus exists regarding which possibilities for actions on social media platforms truly qualify as affordances, making a standardized categorization both difficult and easily contestable.

To address the second research question, which inquired into the extent that social media affordances affect dynamics of radicalization when comparing X, WhatsApp, and Telegram, we extracted all affordances mentioned in the collected literature on radicalization social media and affordances and categorized them into 17 diverging affordances, with anonymity, visibility, and collectivity being the most frequently mentioned ones. Overall, our comparison of the platforms concerning their affordances showed that although each of the three platforms, in principle, engenders an activity framework conducive to radicalization contingent upon users' intention and context of use, the specificities necessitate nuanced consideration. Concerning anonymity, a broad analysis of X, Telegram, and WhatsApp shows that all three platforms can be classified as being similar, whereas a nuanced examination of their different manifestations of anonymity indicates decisive differences. While Telegram's self-branding and feature repertoire contribute to a high degree of personal anonymity, which is particularly relevant for planning attacks, WhatsApp affords lower degrees of personal anonymity, and social anonymity is even lower on Telegram than on WhatsApp. X presents the lowest degree of social anonymity but more personal anonymity than WhatsApp.

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Our investigation into visibility led to a similar conclusion, recommending a distinction between internal and external visibility. Each type fulfills entirely different needs in radicalization-oriented avenues and the extremist mindset. Whereas Telegram and WhatsApp afford a higher degree of internal visibility than X, X affords the highest degree and WhatsApp the lowest degree of external visibility.

Concerning collectivity, our literature-based discussion led us to conclude that collectivity can be regarded as an example of a meta-affordance, as similarly found in the affordances analysis of Prakasam and Huxtable-Thomas (2021), who concluded that some affordances—in their case, "redpilling"—should be analyzed as meta-affordances. Such affordances no longer solely and directly stem from technical features but result from the actualization and interaction of other affordances, including interactivity, visibility, and anonymity.

Beyond affordance-specific considerations, our detailed literature analysis revealed that platforms' *self-image and branding* directly affected the users' perception of the available affordances and thus their potential for radicalization. Kor-Sins (2023: 2321) even argues that, ultimately, the "platform branding of social media platforms dictates users' choices." Thus, platforms such as Telegram and 4Chan, and increasingly X, that openly advocate freedom of expression, oppose content moderation as a form of censorship, and promise full anonymity are perceived as being more attractive for radicalizing and extremist activities than other platforms. However, the role of content moderation, which can be considered as a feature or an affordance depending on the definition and context, is rarely mentioned in the affordance literature reviewed for this paper, albeit its great relevance for extremist actors and communication (Rogers, 2020; Schulze, 2021). This is particularly surprising as one would assume that the scope and presence of extremist actors and their content might contribute to the radicalization potential of platforms (Rothut et al., 2022; Schulze et al., 2022). While the role of content moderation in platform affordance related radicalization research appears to be a general gap in the literature that should be addressed in future work, including the aspect of platforms' self-image and branding would naturally emphasize the significance of content moderation. Therefore, we suggest that this aspect be accounted for in approaches based on social media affordances, which have thus far focused only on the feature affordance user triad (see Figure 3).

Our affordance-specific discussion also revealed an additional challenge in empirical research on affordances: multilevel dimensionality. Affordances are not only variable but can also exhibit different manifestations that directly influence their effects (e.g., social and personal anonymity). Moreover, a platform's feature can condition various affordances, and an affordance typically arises from different functionalities, leading to inevitable overlaps between affordances. Platforms with algorithmic recommendation systems often show a correlation between high interactivity and high external visibility. Beyond that, because affordances may emerge from the interplay and actualizations of other affordances, research needs to be more precise in accounting for the different dimensions and orders (i.e., first-order vs. second-order vs. higher-order) of affordances relevant in the observed dynamics. In our sample, only two papers accounted for the multilevel dimensionality of affordances (Prakasam & Huxtable-Thomas, 2021; Abdalla Mikhaeil & Baskerville, 2024), thereby indicating that a more nuanced consideration is needed. We conclude that interactivity as a social media affordance can be relevant on multiple levels but needs to be regarded as a basic affordance enabling the actualization of other affordances. Conversely, collectivity is best understood as a meta-affordance that is based on the actualization of other affordances, which further complicates the puzzle of social media affordances.

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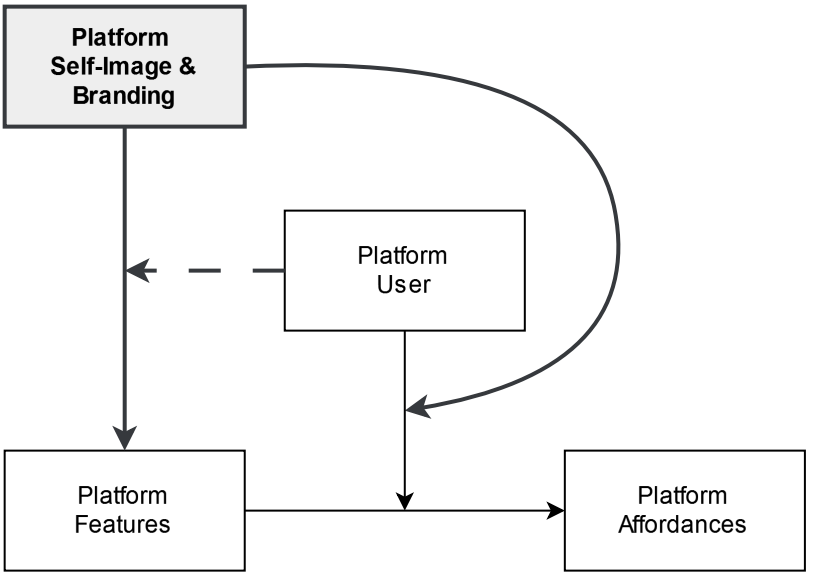
Figure 3: Simplified User-Centric Social Media Affordances Model



Note. The original social media affordance approach focuses on the user and his/her perception or actualization of the affordances derived from the available platform features. We suggest including the role of platforms' self-image and branding in the research of social media affordances because platform branding affects which affordances users perceive and how they utilize them. While the platforms' self-image obviously directly affects the platform architecture and available features, the dashed arrow additionally indicates that platforms typically cater the features to their users' preferences. The visualization intentionally simplifies the different interdependencies to emphasize the model extension. The dynamics at play are, of course, more complex when considered in detail and, most importantly, they are recursive.

7. Conclusion

This paper proposes that analyzing affordances in relation to radicalization dynamics on social media can enable a novel perspective and a more nuanced consideration of the internet's role in the dynamics of radicalization. Our literature-based analysis yielded an initial suggestion and overview of how different affordances, especially their varying manifestations, affect those dynamics and have contributed to the radicalization potential of specific platforms. The affordance-based approach, however, not only allows for a more nuanced analysis of dynamics at play, but also the systemic consideration when accounting for the actualization and interactions of different affordances on platforms and how they amplify or minimize each other. Ultimately, the whole may be greater than the sum of its parts, for affordances are mutually dependent on or directly related to each other and therefore influence each other. While our comparative analysis of platforms by affordances revealed decisive differences in how specific platform features contribute to the dynamics of radicalization, an overarching view of collectivity as a meta-affordance and interaction as a basic affordance enabled a more holistic image of the role of affordances.

For the future, we invite researchers to take our discussion as a starting point and as a source of inspiration for conducting empirical analyses that use affordance-based approach-

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es to account for the different dimensions and dynamics at play. Such approaches could be used to observe the specific use of platforms in the overall communication repertoire of actors to strategically accelerate radicalization dynamics as a means to better understand and consider which platforms fulfill which functions. Regardless of strategic use, it is also necessary to more strongly consider the role of, and impact on, platform users in empirical research. However, such analyses should not only focus on the isolated examination of individual platforms but also compare platforms to achieve more universally applicable conclusions.

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