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Van Raemdonck, Nathalie; Pierson, Jo

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A conceptual framework for the mutual shaping of platform features, affordances and norms on social media

Nathalie Van Raemdonck & Jo Pierson

This is a translated version.

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Abstract

This paper investigates the mutual shaping between social networking platforms and social interactions by developing a framework of relevant platform features and the affordances they facilitate. More broadly, this framework will eventually serve to answer the question: which platform affordances influence norm building behavior in groups? The relevant affordances the authors identified are ‘interactability’, ‘interventionability’, ‘ephemerality’ and ‘external visibility’. These affordances are complementary to danah boyd's (2010) structural affordances of networked publics. Mapping the features that facilitate these affordances makes clear who can interact with whom, to which content people can be exposed to and who can make normative interventions. These affordances can affect social influence mechanisms and impact norm building in groups. This framework also show where the responsibilities lie in influencing group dynamics, and when newcomers are able to challenge the norms in a group interaction.

Keywords: affordances, social network sites, social media, social norms, moderation, walkthrough method

Introduction

On January 31, 2020, an American mother posted in the closed Facebook group *Stop Mandatory Vaccination* that her four-year-old son had a high fever and seizures. She had gone to the hospital where the doctor prescribed her antiviral medication to make the symptoms of a likely flu bearable. Since the mother didn't trust the doctor nor the medication, she asked the group's 139,000 members how she can help her infant son instead. Some 45 responses applauded her distrust and recommended, among other things, to have her son drink boiled water with thyme, to put potato slices in his socks and to give him vitamin C until he gets diarrhea. No one in the group encouraged the mother to follow the medical advice. A few days later, her infant son died of the flu at home (Zadrozny, 2020).

Some members of the *Stop Mandatory Vaccination* group wanted to advise the woman to follow the doctor's advice, but feared being thrown out of the group. This observation was shared in the competing Facebook group *Vaccines save lives*. While the rumor is difficult to confirm, it is still striking how none of the 139,000 members in *Stop Mandatory Vaccination* urged the woman to seek medical attention, despite the group's consensus. Such lack of dissent is possibly due to what Irving Janis calls (1982) '*groupthink*', where unanimity is considered more important than critical reflection. One of the founders of social psychology, Solomon Asch, showed in his 1951 experiments that people were prepared to ignore reality in order to adapt to the rest of the group. These findings were later nuanced with the social identity theory, which states that when people identify with certain groups, an in-group is formed to which people are loyal (Tajfel & Turner, 1986). Social identity theory posits that people's opinions and actions are to a certain extent influenced by the social groups they identify with (Cialdini & Goldstein, 2004). The Facebook group in our example is sometimes called an "echo chamber", which Sunstein (2009) describes as a highly polarized cluster of like-minded individuals. Unanimity in such groups can breed social norms that clash with broader mainstream norms in society. Researchers have already shown that echo chambers can exist on social networking platforms, and indeed are most prevalent on Facebook (Cinelli et al., 2021; Del Vicario et al., 2016).

The social impact of such online ‘echo chambers’ needs to be taken with a pinch of salt, as the exposure to all forms of online and offline information need to be taken into account. Research by authors like Picone & Vandenplas (2022) showed how the vast majority of the population has a fairly diverse media diet, meaning online echo chambers have on average a minor impact on human behavior (Arguedas et al., 2022). Which is not to say some social norms can’t have dire consequences in some extreme cases of echo chambers, as in our example. What constitutes a ‘dangerous’ social norm is however in many ways also a value judgment that cannot be made too lightly. Echo chambers can also be seen as safe zones for users who do not fit within the norms of a particular society. For example ethnic minorities, transgender people or dissidents in authoritarian societies benefit from the existence of online spaces where they can escape the potentially ‘suffocating’ social norms, and create their own. In this paper we try to steer clear from investigating the danger of social norms, but aim to investigate how groups develop norms within the context of social networking platforms. We see the starting point of that search in the architecture of platforms.

Scholars have long recognized that architecture in the physical world can systematically influence people (Shah & Kesan, 2007). In his work, Lawrence Lessig (1999) indicated that social norms and technological architecture are closely linked. They are two of the four forces that regulate individuals, besides the market and the law. This interplay or ‘mutual shaping’ of spaces and social norms of behavior also takes place in everyday digital life. (Postigo, 2016; Van Dijck, 2013). For example, the lack of interaction opportunities for outsiders with such a closed Facebook group, and the hierarchical authority some group moderators have, can reinforce groupthink and potentially stifle dissent. (Van Raemdonck, 2019). Thus, a perception of consensus may emerge about the superiority of natural remedies over pharmaceuticals, which may become a norm in the group that no one dares to contradict. This leads to the research question how the architecture of social networking platforms plays a role in norm development. We start from the concept of *affordances*.

Affordances were originally developed in ecological psychology (J. J. Gibson, 1982), later adopted in the field of *human-computer* interaction (Norman, 1988) and for some time also further elaborated in media studies and communication sciences by authors such as boyd (2010); Bucher and Helmond (2018), Davis and Chouinard (2016), Evans et al. (2017) and Treem and Leonardi (2013). Generally, the concept of affordances is used to describe how material artifacts can guide people's behavior

(Evans et al., 2017). The affordances themselves do not guide the actions of a person (such as a social media user), but they indicate the way in which an object (such as a platform feature or architecture) can guide this behavior. Thus, each social media user sees the same platform feature, but each user may have a different perception of what he or she can do with that feature. In this paper, we identify four categories of affordances relevant to social norm development among social media users, namely interactability, interventionability, ephemerality, and external visibility. We structure the social media platform features that facilitate these affordances into an overview for each affordance category.

We deem it important to avoid technological determinism when considering the role of affordances and social norms. People are free agents whose motives can be independent of their physical or digital environment. This is however not to say that environmental factors cannot have an impact on human behavior. By focusing on affordances, we acknowledge that platform architectures can guide behavior. They can influence group dynamics that can lead to social action or inaction. The founder of the concept, James Gibson (1979) observed that the most interesting affordances are provided by other people. Hence our question: what affordances do social network platforms offer that make people influence each other's actions through norms?

In the article, we will first take a closer look at the notion of 'affordances' and then make the link to norm development on social media. We will then discuss how we arrived at the four affordance categories and the overview of platform characteristics, after which we will explain the four affordance categories individually. This conceptual framework is based on a systematic analysis of an extensive set of social networking platforms. The overview of platform features and the conceptual framework of affordances based on this research can serve as a starting point for questions about activist (in)action, echo chambers, the spread of disinformation and hate speech, and polarization and conflict on social media.

Contextualization and theoretical framework

Social affordances

As briefly explored in the introduction, the concept of 'affordances' has been analyzed and applied in various ways, including in communication sciences. In this section, we build on the perspective of 'social affordances'. Social affordances are used by sociologists and communication scholars to talk

about the ways in which technology influences everyday life and enables it to shape social structures (Bucher & Helmond, 2018; Hsieh, 2012; Postigo, 2016; Wellman et al., 2003). Thanks in part to social affordances, a social structure can be shaped on the basis of the relationship between people and their (technological) environment. Treem and Leonardi (2013), for example, described in detail how social media significantly influence social structures in companies.

The social structures we focus on are 'groups on the Internet'. Groups are understood here as networks of individuals who share information with each other and thus influence each other. Groups on the Internet are sometimes more, sometimes less clearly outlined. Mizuko Ito (2008) and later danah boyd (2010) spoke of '*networked publics*' to describe the online Internet users that are structured by network technology. Such networked publics do not have clearly defined boundaries that determine where a group begins and ends, and are more transient. Delfanti and Arvidsson (2018) provide the extreme example of a group temporarily formed around a hashtag on Twitter. Despite the fact that borders around online groups can be transient, individuals can still form a group through a shared social identity from which norms can emerge. So instead of looking at individual social media users, we look at the development of groups, however loosely connected they may be. We do this also because the whole can be more than the sum of its parts. A norm in a group emerges from a consensus in that group, or at least the perception of consensus, and is not a sum of individual decisions (Cialdini & Goldstein, 2004).

Norms

Norms do not appear out of thin air, nor are they made up by any individual in particular. They are developed within a particular social context by members with a shared social identity. Functionalists such as Parsons (1951) and later Coleman (1990) saw norms emerge to solve collective problems. Others such as Axelrod (1984) saw that norms emerge when people have to interact with each other on a regular basis. As a result, a certain pattern of actions is formed to avoid misunderstandings and misperceptions, which is then experienced as 'normal' by the group. When norms emerge from those interactions, they are passed on through a process of what Parsons (1951) calls 'socialization'. Individuals learn norms through their social environment and internalize them. Norms become apparent when people observe them in the behavior of others, or when people are explicitly told what

the norms are (Cialdini et al. , 1990). By explicitly describing the norms to people, those who share such social identity engages in social correction, ensuring that the norm is observed.

Coleman (1990) argues that a norm remains alive as long as it remains effective to maintain it with social corrections and social sanctions, or what we like to call 'normative friction'. Social sanctions are more of a punishments for violating a norm rather than a social correction. The line between these two is however blurred, given that a public correction can also be perceived as a sanction when those corrected feel embarrassed. If enough people violate the norm and the violation is not punished, the norm can disappear or evolve into a new norm. (Legros & Cislighi, 2020). Norms can thus emerge, be maintained, transform and disappear at any time, depending on the social context in which they are (no longer) maintained. We refer to this as norm development or a 'normative process'.

Interaction of affordances and norms

The interaction between social affordances and norms is being addressed in an emerging field of cross-platform analyses of which we will highlight some examples. These approaches confirm that platform specificity plays a role in norm development. For example the research of Theocharis et al. (2021) shows the impact of the visibility of interventions on the belief in conspiracy theories about COVID-19 in various countries. Belief in conspiracy theories about COVID-19 was found to be less prevalent on Twitter compared to WhatsApp, Facebook, Facebook Messenger, and YouTube, which the researchers attributed to the tighter public scrutiny on Twitter. Visible social corrections could potentially enforce a norm for other users, who are warned about the existence of that norm.

Visibility can also have a deterrent effect. A study of Bastiaensens et al. (2015) showed, for example, that bystanders of online harassment intervene differently depending on the affordances that shape their communication. For example, people are more likely to support a victim through private channels. The visibility of their intervention is apparently part of the risk calculation users make when considering whether to intervene. Public intervention can make them potentially the next victim of the harassers. Research by Marwick (2021) on 'morally motivated networked harassment' shows that online bullies often justify themselves as a sort of 'norm police'. Their harassment is

meant to enforce norms with people who do not fit the norm – sometimes by choice, sometimes unintentionally such as minorities.

Rossini et al. (2021) also found that social correction of misinformation occurs differently on WhatsApp than on Facebook, with corrections of misinformation actually being more positively associated on WhatsApp because of the intimate setting. That intimate setting may make one experience a social correction less as a social sanction because one is not publicly shamed for sharing misinformation. We therefore conclude that visibility of behavior plays a major role in norm development but also in whether or not there normative friction took place.

Other research showed how punishment of those who fail to meet a norm can be reinforced via certain affordances. Massanari (2017) discovered how the karmic system of upvotes on Reddit creates a 'toxic technoculture', a finding supported by Gaudette et al. (2020). These studies show that the upvote system on Reddit created in- and out-groups on the platform. Indeed, the in-group has the ability to downvote anyone who does not resemble the in-group. Redditors lose so-called 'karma', the virtual point system on the platform that confirms one's status, when they are downvoted. This reinforces the norm of the in-group for everyone who wants to interact on the platform.

This prior research shows that differences in platform architectures can have an impact on norm development, only no overarching approach exists to distinguish which affordances may be relevant for such norm development and normative friction. This article provides a possible basis for such an approach, based on an overview of platform features enabling four affordances that may have a potential impact on norm development.

Method

To identify the social affordances that influence norm development, we start from boyd's (2010) structural affordances of networked publics on social network sites (SNS). boyd identified four affordances that make information and social actions spread within networked publics: replicability, scalability, searchability and persistence. These affordances were mainly based on the SNS that were built around social media profiles. (boyd & Ellison, 2007).

Given the increased 'platformization' (Poell et al., 2019) of social network sites, we prefer to use a broader term for social media, namely 'social network platforms'. By 'platformization' we mean that former social networking sites have become their own microcosm in the form of applications, and have taken different forms, such as digital platforms and mobile messaging apps (Pierson, 2021). boyd's 2010 work is still a seminal work, but due to the rapid digital evolution over the past decade, we find that there is a need to reframe these structural affordances for a wider range of social networking platforms and from a group perspective on norm development.

The conceptual findings in this article are based on desk research. For this purpose, twelve platforms were first systematically analyzed from a technological perspective: Facebook, YouTube, WhatsApp, Instagram, TikTok, Facebook Messenger, Telegram, Snapchat, Pinterest, Twitter, Reddit and Quora. The selection of platforms was based on their size, specifically the platforms with the largest number of average users per month worldwide, anno January 2022 (Statista, 2022). It was also necessary to have access to social groups on these platforms. Consequently, the current framework is primarily based on Western and American social networking platforms due to the lack of language skills and cultural knowledge to observe social groups on other platforms. The selected platforms were examined during the period between November 2021 and January 2022 using the *walkthrough* method (Light et al., 2018). This method allows applications or platforms to be analyzed socio-technologically in a systematic manner in order to gain deeper insight into how their technical platform features can shape user interactions. This allows us to systematically uncover the affordances that influence norm development.

During the walkthrough of these platforms, we identified the relevant platform features that allow users to reach a consensus on norms, and that allow users to prevent theirs and other users' visibility of interactions. More specifically, we looked at the features that determine how groups can define their social context and thereby determine to whom a norm applies. This was supplemented with features that determine how information can flow in and out of that group. This resulted in four affordances; (1) interactability, (2) interventionability, (3) ephemerality and (4) external visibility. We consider these affordances crucial to better understand group perspective and norm development in social networking platforms.

The analysis of the twelve platforms formed the basis for the four identified affordances. To further validate the latter, they were then checked between January and August 2022 on a more extensive selection of social networking platforms. This made it possible to identify possible missing features and to verify whether the affordances in question are also applicable for norm development on the broader set of social networking platforms. The broader selection is based on platforms described in the 'Illustrated Field Guide to Social Media' by Rajendra-Nicolucci and Zuckerman (2021). Here, we adopt Rajendra-Nicolucci and Zuckerman's logic where we look primarily at platforms built with social interactions as the goal, rather than platforms that have social features as an afterthought. We have chosen fourteen platforms across seven categories with which we were sufficiently familiar to identify the four affordances. These platforms are: Imgur, Twitch, Tumblr, LinkedIn, Discord, Omegle, Stack Overflow, Ask.fm, 4chan, 9gag, HackerNews, Archive of our Own, Gab and MeWe.

Based on 12+14 platforms, we describe the four affordances and compile an overview of features that facilitate these affordances. While we will occasionally use examples from the desk research, our overview of affordances is platform-agnostic to maintain a focus on affordances rather than specific digital platforms, as platforms are constantly evolving and adding or transforming features. The affordances enabled by particular features in this overview should be seen as the building blocks by which norm development is influenced.

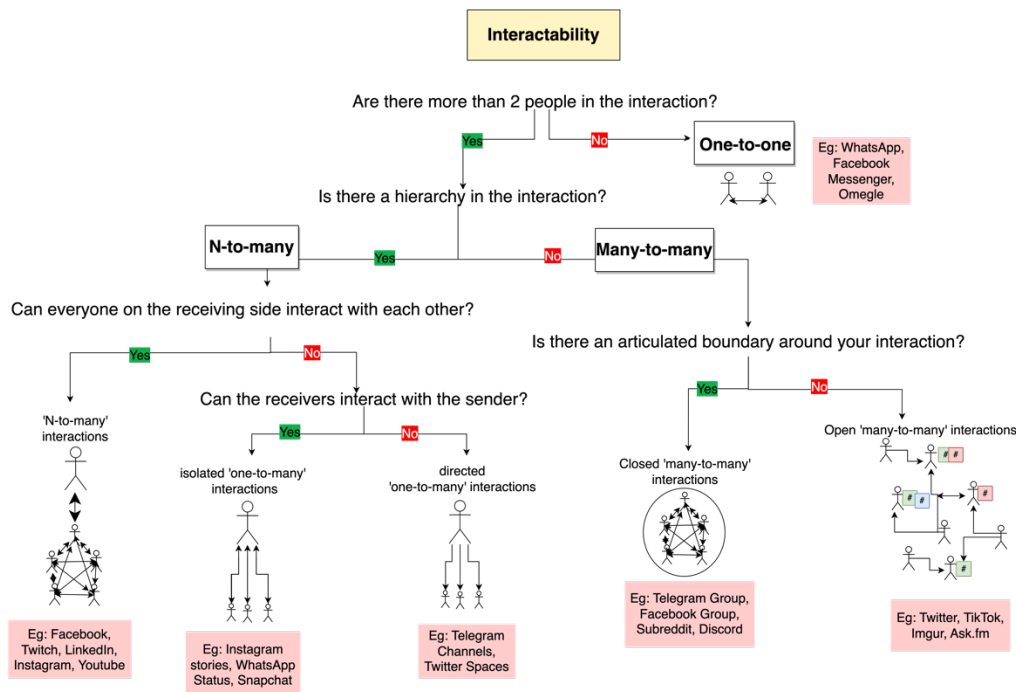
Affordances framework

Interactability

Interaction opportunities on social networking platforms have a major impact on group formation. Scientists like Granovetter (1978) previously demonstrated how the structure of a social network can have important implications for information dissemination and patterns of collective behavior. This has also been explored more recently by Newman, Barabási and Watts (2006) and Centola and Macy (2007). From this prior research, we deduce that the structure of social networks and the demarcation of groups play an important role in the development of norms. Architectural differences on platforms can influence interaction abilities in different ways, which we refer to as 'interactability'. This affordance is actualized in different ways, depending on the ways in which users can interact with each other, how the boundaries of a 'group' are determined and who has hierarchical superiority in

these interactions. We subdivide features that facilitate interactability into three types; *one-to-one* interactions, *n-to-many* interactions, and *many-to-many* interactions, which is roughly based on the way data models are constructed for system analysis. (Watt, 2014).ⁱ Figure 1 shows these three types with some examples of platforms where such features are prominent. Note that different platforms may have different combinations of these features.

Figure 1. *Features that facilitate interactability.*



One-to-one. As long as only two users are involved in an interaction, we speak of *one-to-one interactions*. The one-to-one element means that no other senders or receivers have access to this interaction. The visibility of that interaction is limited to these two users, unless one of the participants shares information from the interaction outside this social context. There is no hierarchical superior in this interaction. When a one-to-one interaction has an audience, it becomes an n-to-many interaction.

N-to-many. Most platforms with a focus on 'profiles' are built with an *n-to-many interaction capability*, meaning that content is distributed by one or more profiles to friends/followers/subscribers or some other form of connection as described for social network sites

(boyd & Ellison, 2007, p. 164). The 'n' in this interaction, also called the 'sender(s)', is a hierarchical superior to the 'many', also called 'receivers'. Senders may be alone, or with multiple users, but what typifies them is that they are the only ones who can initiate and also terminate the interaction, which makes them hierarchically superior. As we will see later, they also have more 'interventionability', meaning there's more options in terms of intervening. In n-to-many interactions, senders control the social context because the interaction takes place on their own articulated space on the platform (their 'profile'). A reaction left on their profile therefore remains in this location and is not visible anywhere else on the platform. When all receivers can interact with both the original sender(s) and each other, the receivers also have a high degree of interactability.

When the receivers cannot interact with each other, they have less interactability, which we call *isolated n-to-many* interactions. There are platform features that make receivers able to interact with the sender(s), but where these interactions are not visible to other receivers. This is comparable to receiving an e-mail via Blind Carbon Copy (BCC). Consequently, receiver interaction will have less influence on all other receivers. At the same time, they also cannot be judged by other receivers if their interaction violates any norms, for example replying with harassing messages. Thus, lower interactability makes it difficult for the 'many' to participate in the public normative process, they can only influence the sender(s) who must be willing to share their comments with other receivers.

Sometimes the platform features do not allow interactability for the receivers at all, what we call *directed n-to-many* interactions. In this case, there is no interaction opportunity with the person who created the content, nor with other users who see this content, unless they discuss the content in their own social context where they are the sender. This interactability is also specific to the 'broadcast' model of mass media such as television or newspapers. In this interaction there is no possibility for receivers to participate in the normative process where the sender is located.

Many-to-many. The many-to-many interactions differ from n-to-many in that there is little hierarchy between senders and receivers in terms of interactability. They do not take place on someone's profile or personal space, but in a 'neutral' zone on the platform occupied by the group. In most cases, some users will have more access to interventionability when they are the moderator, but no one has

more or less interactability. Any user can share content in the many-to-many interaction, and all users with access to the interaction can see and respond to it.

We distinguish between platform features that give a many-to-many group a clearly defined space on a platform, and those where the many-to-many interactions have no clear group boundary. Whether a many-to-many interaction is open or closed can exist somewhere on a spectrum, depending on how articulated the boundaries are. In the most closed cases, there are platform features that make it possible for someone to be 'in' or 'out' of the many-to-many interaction. Within that group, everyone has equal interactability, but users outside the delimited group have limited to no interactability.

In the most open cases, when the many-to-many interaction has no clear group boundary, the interaction takes place on a common space where anyone with access to the platform can participate. This means that this *open many-to-many* interaction can reach many different users, which can lead to many more converging contexts or '*collapsed contexts*'. boyd (2002) defines the latter as spaces where a piece of content finds its way to an audience that has a different understanding of the original context. In the most open many-to-many type of interactions, there is no boundary whatsoever to demarcate the group and potentially limit the interactability of users that are not part of the original social context. This allows for very high interactability with each user.

In conclusion, the features that make interactability possible have an impact on norm development. They help determine the social structure and who is hierarchically superior. They determine who has visibility on the interactions of others and how much the boundaries of a group are articulated.

Interventionability

As we explained earlier, human behavior can be guided by the perception of what is acceptable social behavior, also called a social norm. This perception can be influenced by the intervention of norm-enforcing users that apply normative friction. We identify three categories of features that enable 'intervenability': (1) features that help clarify norms explicitly through a social correction, (2) features that help punish norm violations with a social sanction, and (3) features that hide violations of the social norm so that other users do not become aware that the established norm is being challenged. We list these possible features in Table 1 and break down how users with more

intervening power (senders/moderators) as ‘superior users’ can make exclusive use of them. This specification partially builds on the hierarchy we showed in interactability, as senders in n-to-many interactions automatically have more interactability than receivers.

Table 1. *Features that facilitate interventionability*

Category	Features that facilitate interventionability
Identifying norms (social correction)	Show rules (<i>sender/moderator</i>) React with comment Emoji reactions Send private message
Punish transgressions (social sanction)	Take away interactability (<i>sender/moderator</i>) Delete users from the group (<i>sender/moderator</i>) User blocking (<i>sender/moderator</i>) Notify users with greater interventionability Reporting to the platform
Hiding violations	Delete comments (<i>sender/moderator</i>) Downvote

Superior interventionability of senders and moderators. There are features that can give these users the space to set rules, which can immediately make prevailing norms visible. Research on Reddit showed that clearly stated group rules makes it easier for people to follow those rules (Matias, 2019). Senders and moderators also have more access to features that can punish violations, such as removing users from the group or reducing their interactability. Clarifying why this intervention took place can also have a positive effect on the users who made the violation. Jhaver et al. (2019) found that the likelihood of an intervention on Reddit would decrease by 20.8% when content deletions were explained in person. When interventions are visible to other users, research on Twitch found that other users took this as an example of having to respect norms (Seering et al., 2017).

Senders and moderators may also choose to hide violations, based on the logic that many visible violations may challenge the norm for other users. For example Wachs and Wright (2018) showed how seeing hate online among young people led to more hate. When these privileged users wield

their interventionability which ordinary users do not have, they take on an important role as norm guardians of their group.

Normal interventionability of users. Other users can still signal norms in a social context, primarily through 'comments'. Research by Miškolci et al. (2020) has shown that when users reacted against Roma-hatred, there was an increase in the number of pro-Roma comments within the same comment threads. When users let others know that a certain behavior is not desirable, others may join them. Besides leaving comments, there are other features to signal norms. There is the infamous 'like' button, popularized by Facebook, also extended to a wider range of formalized emotions. (Somers, 2017). This produces an 'affective reward' (Graham, 2018) and provides social signals of acceptance or disapproval. (Scissors et al., 2016; Picone et al., 2019).

There are also features where ordinary users can give violations less visibility and hide them from others. For example, users can give a negative score to content, such as a *downvote* on Reddit, making it less visible. This can lead to the enforcement of dominant norms, as previously explained by Massanari (2017) and Gaudette (2020).

Delegating Interventionability. There are also features that allow users to notify senders or moderators who have more interventionability, effectively delegating authority to these actors. When these do not intervene, users can also report norm violations to the platform and delegate intervention powers to a higher authority. The intervenability of platforms has already been extensively described by authors such as Gillespie (2018). There is often a lack of democratic oversight of the decisions made by platforms in these cases. Helberger et al. (2018) previously described a proposal of a cooperative responsibility of platforms, users and public institutions to hold platforms accountable. This is especially necessary when users have little interventionability and must rely on the platform to intervene when a norm violation occurs. We conclude that interventionability is the main affordance through which users can guard social norms and potentially prevent them from being violated, which is sometimes limited to only commenting and/or reporting to the platform.

Ephemerality

How long interactions are visible has an impact on norm development and the evolution of norms in a social context. boyd (2010) called the affordance for the extent to which content remains present '*persistence*'. She described the dynamics in networked publics as '*persistent-by-default, ephemeral-when-necessary*' (2010, p. 47). Over the past decade, content on some platforms has also become '*ephemeral by default*'. Users can in some cases even choose how ephemeral their interactions are. When the content of interactions disappear, this has an impact on normative processes, as it is harder to correct or sanction users on content this is no longer visible. Therefore, we reinterpret boyd's *persistence* affordance as the ephemerality affordance because it better captures how interactions can also be made fleeting.

The less ephemeral an interaction, the more it operates in what Castells calls (1996) 'timeless time'. Multiple interactions can take place simultaneously, but also at a much later time than when the sender sends a piece of content into the world. Since it is possible that social norms have changed at a later time, users can be punished for interactions that took place in a social context with different norms. We divide the features that facilitate ephemerality into (1) features that enable synchrony, (2) features that make interactions disappear, and (3) features that make interactions difficult to find.

Synchrony. Users have more access to ephemerality when interactions occur synchronously. Features that create the most synchronous interactions are features where the interactions automatically disappear after they take place, which often occurs in livestreams. Users must be present to observe the interaction. Synchronous interactions such as chronological display of text exchanges also have a high degree of ephemerality. This is in contrast to algorithmic ranking of content where the most popular content is more visible and permanent. This chronological representation is what Rajendra-Nicolucci and Zuckerman (2021) describe as '*chat-logic*'. If recipients wish to contribute to normative processes in synchronous interactions, they must be present regularly.

Interactions disappear. Users can also have more access to ephemerality when interactions are not stored anywhere, or disappear after a certain amount of time. This can serve as an automatic cleaning process, freeing users from being haunted by old interactions. Platforms can also provide users with

features to delete content themselves. This may be of their own content, or of other users if they have intervening capabilities.

Interactions are difficult to retrieve. There is also more ephemerality when interactions are difficult to retrieve. Content is usually not gone and lost forever. Even on platforms where ephemerality is included in the features by default, storage may be optional for the sender and/or receiver. But the ease in which this stored content can be retrieved matters for ephemerality. boyd (2010) also describes this with the affordance '*searchability*'. Some platforms offer users support in retrieving interactions after they took place. Other platforms give users more ephemerality (willingly or unwillingly) by making it difficult to retrieve interactions.

A high degree of ephemerality can provide more normative flexibility. People can be held less accountable which means norms are not as constraining, but these norms can thus also evolve more quickly or be almost completely absent. For example Bernstein et al. (2011) described how the ephemerality of 4chan is a powerful selection machine for the production of attention-grabbing Internet memes but also for a fading sense of social norms.

External visibility

We have chosen to call one category of affordances '*external visibility*', but the common thread throughout each of the four affordances is the visibility of norms in general. This also became clear in the overview on norm research: norms take shape when they are perceived, and compliance is influenced by the visibility of people's behavior. The mere visibility of content for users has also often been described as an affordance by other academics, such as Treem and Leonardi (2013). However, we would like to emphasize visibility here as an affordance that allows users to make content visible outside the original group and the social context in which it occurs, thus giving it '*external*' visibility. boyd (2010) describes the spread of content with the '*scalability*' affordance. In it she describes that there are platform features that make it possible to give content enormous visibility in networked audiences. We agree with this analysis, but also want to view this scalability from the perspective of norm development in groups. This leads to the question which features allow users to make content (more) visible outside the initial group where the interaction took place, and thus how content can become visible in another social context with potentially clashing norms.

External visibility can put pressure on groups with a shared social identity because it may add new users to the social context, who may or may not have interactability. The previously mentioned '*collapsed contexts*' (boyd, 2002) can transform norms, or provoke conflict between groups with radically different norms. External visibility as we conceptualize it is enabled by platforms through sharing features and platform algorithms.

Sharing features. Content can spread in a semi-organic way when users consciously make content visible by sharing it in their one-to-one, n-to-many or many-to-many interactions. When content is shared outside the original group where it came from, it can potentially challenge a norm in other groups. Some features that provide external visibility also allow users to see the original social context from which the content was shared. This leaves the ability for users to influence that social context depending on the interactability in that group.

Platform algorithms. Platform algorithms can also determine which content is made visible to users. Developers' political and cultural preferences will always be intentionally or unintentionally embedded in the design of algorithms, which will influence how content is made visible (Noble 2018). But platforms also adapt visibility a great deal to the behavior and preferences of individual users (Tadesse et al., 2018). Thus, users also have some visibility affordances when they adjust their online behavior and alert the algorithms to their preferences. Their behavior creates external visibility of the content they engage with – comments, interactions and views are key signals that most algorithms pick up to make this content visible to a larger pool of users. If users are not aware of these signals, the visibility of content can be enhanced unconsciously for other users. For example, users may respond to a lot to content that angers them thus amplifying such content algorithmically, without necessarily wanting to provide this content with more external visibility.

When groups are less clearly delineated, as in open many-to-many interactions, algorithms allow users to be more exposed to similar content, which can evolve into a shared social identity. This means that communities and the appearance of 'groups' are increasingly shaped by algorithms, as also noted in the work of Beer (2017).

Conclusion

This article starts from the idea of a mutual shaping between a social context and norm development. Indeed, norm development can be strongly influenced by the technological environment (of social network platforms) in which the social context takes place. To clarify and structure these mutual shapings, we developed a proposal for a framework of affordances that influence norm development by carving out an overview of relevant features. The common thread in these affordances was the authority of users and the visibility of interactions, as people are more inclined to comply with norms if they know that their behavior is observed by others who are in strong support of the norm.

We distinguish several features that facilitate four affordances which shape norm developments within social network platforms. Features that facilitate what we called ‘interactability’ determine which users can interact with each other on a given platform and what part of that interaction is visible to others. Such interactability perpetuates a certain hierarchy among users and also defines the boundaries of a social context. Features that provide ‘interventionability’ allow users to enforce norms by making social corrections or providing social sanctions depending on their hierarchical position, which potentially reduces visibility. Features that provide ‘ephemerality’ allow users to make content and interactions visible only temporarily. This influences the timespan in which users need to be present to potentially participate in norm development. Finally, there are features that provide ‘external visibility’ of content outside the social context. These influence how users can make content visible outside their original group, potentially leading to norm development outside of the original context, thereby expanding the social context.

By mapping these affordances based on our walkthrough of 26 platforms, it becomes clear that depending on the platform, some users can exert more influence on norm development than others, and thus have more authority. Users with more access to interactability features can set the tone for norms, users with more access to interventionability features can hand out sanctions and monitor group norms. Users making more use of ephemerality can better hide their own norm violations, or force other users to be present to engage in norm development. Users who deploy external visibility can create norm conflicts and potentially push their group's norms on users in other social contexts.

This overview creates a better picture of how platforms may bear responsibility for norms that can have harmful consequences, such as misinformation about health, but also in online conflicts where online harassment can be rationalized by users as ‘normative friction’.

This framework of affordances attempts to provide a language to more accurately study the effects of particular platform architectures on group dynamics. It allows researchers to point out the differences between platforms. With a more holistic perspective on the online information ecology, we can hopefully better understand how group dynamics evolve on social networking platforms.

Note

¹System analysis is used to develop (computer-based) information systems. Data are linked together on the basis of a data model. The relationship of data in a database table to another table is called 'cardinality'. Two tables can be related as 'one-to-one', 'one-to-many', or 'many-to-many'.

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