Seismo

Reconsidering a multivalent concept: An integrated affordance framework to approach technology and social media use

Tobias Frey, University of Zurich, Department of Communication and Media Research IKMZ, Switzerland
t.frey@ikmz.uzh.ch

Abstract

The affordance concept has been widely used in communication studies to theorize and examine social media use beyond specific features and practices. However, its implementation is characterized by an inconsistent use of terms and a neglect of the concept's relationality. The present article demonstrates and addresses these shortcomings. First, it briefly reviews the affordance perspective's origins and its further development in communication literature. Second, it outlines the perspective's diverse but inconsistent application in social media research. Third, it introduces an integrated framework that contributes to a better understanding of affordances and supports a more precise use of the underlying concepts and terms in social media research. The framework a) emphasizes the relational nature of affordances as opportunities for action that occur in various technological and social contexts and are contingent on designed and cognitive mechanisms, b) it highlights the abstract nature of individual, relational, and collective affordances that are distinct from outcomes such as practices and structures, and c) it encompasses effects and dynamics that impact both technology and actors. Drawing on the framework, the article concludes with conceptional, empirical and terminological implications for future research approaching technology and social media use from an affordance perspective.

Keywords

affordances, imagined affordances, technology, social media, social media sites, relationality

1 Introduction

This article explores a multivalent concept regularly used and continuously debated in and across disciplines – *affordance*. Commonly referring to what material artifacts allow people to do (Bucher & Helmond, 2018) affordances proved valuable to identify and investigate opportunities for interaction with technology and new media beyond single features or practices (Bucher & Helmond, 2018; Ellison & Vitak, 2015). First introduced in ecological psychology (Gibson, 1979), affordances were later adapted in design theory (Norman, 1988) and further advanced to conceptualize the users' interaction with technology (Gaver, 1991; Hutchby, 2001). In social media literature, rather technology-centered early work on affordances of social network sites (boyd, 2008; Papacharissi & Gibson, 2011) stimulated a shift toward a user-centered understanding of affordances (e. g., Costa, 2018; Jones, 2020; Valkenburg &

Piotrowski, 2017) and related outcomes (e. g., Davis & Jurgenson, 2014; Loh & Walsh, 2021). Although both perspectives undoubtedly provided valuable insight to social media use, the varying reinterpretations of affordances resulted in inconsistent and sometimes inappropriate use of the term (Davis & Chouinard, 2016; Evans, Pearce, Vitak, & Treem, 2017) and a neglect of its relational and abstract nature (Nagy & Neff, 2015, 2023).

The aim of this article is to demonstrate and address these shortcomings and to foster a better understanding and more precise application of the affordance perspective in social media research. First, it briefly reviews the origins of the affordance concept and the diverse ways it has been advanced in communication literature. Second, it outlines the concept's application in social media studies entailing a shift from a rather technology-centered toward a user-centered perspective, resulting in inconsistent and inappropriate use of terms. Third, an affordance framework is

introduced that integrates original and contemporary theoretical work and highlights key aspects of an affordance perspective that must be acknowledged to overcome identified shortcomings in social media literature. This framework a) emphasizes the relational nature of affordances as opportunities for action (Gibson, 1979; Hutchby, 2001) that occur in various technological (Ilten, 2015; Postigo, 2016) and social contexts (Davis, 2020) and are contingent on designed mechanisms on the side of technology (Davis, 2020; Davis & Chouinard, 2016; Norman, 2013), and cognitive mechanisms on the side of actors (Costa, 2018; Gaver, 1991; Gibson, 1979), b) highlights the abstract nature of affordances (Gibson, 1979; Nagy & Neff, 2015, 2023; Shaw, 2017) and differentiates individual, relational and collective affordances (Hutchby, 2001; Leonardi, 2013; Turner & Turner, 2002; Vaast, Safadi, Lapointe, & Nagoita, 2017; Weichold & Thonhauser, 2020; Wellman, 2001) that are distinct from outcomes such as practices and structures (Evans et al., 2017; Volkoff & Strong, 2017), and c) encompasses effects and dynamics that affect both technology and actors (Abidin, 2021; boyd, 2008, 2011; Bucher & Helmond, 2018). The framework is illustrated and discussed with examples related to social media use. Conceptional, empirical, and terminological implications for future research are outlined and discussed on the backdrop of today's social media landscape.

2 Origins and advancements of the affordance approach

Originating in ecological psychology, the affordance concept was introduced to reflect how actors perceive opportunities to act provided by the environment (Gibson, 1979). In Gibson's view, people primarily perceive what objects afford (e. g., a cave offering shelter) rather than its properties or qualities (e. g., the cave being made from stone). Simultaneously, people might differ in their perception or interpretation of the environment (a cave can be missed or appears too small), highlighting the relationality of affordances, which are constituted by the environment *and* the actor. Adapted to human-made objects or artifacts, Norman (1988) followed a design-oriented perspective and understood affordances as inherent properties of objects that people might perceive. Thus, the quality of design is reflected by the ways people perceive and engage with intentionally embedded affordances. Norman (2013) further expanded on the role of perception by introducing designed signifiers that make certain affordances visible to end-users. This design-focused interpretation and the emphasis on the actor's perception made the concept accessible for human-computer interaction and Internet studies (McGrenere & Ho, 2000), where it has been additionally refined.

Gaver (1991), for instance, argued that the relation between technology and user goes beyond visual perception, and *technology affordances* should be defined regarding people's interaction with technology. Depending on the fact that perception can be incomplete or incorrect, Gaver (1991) introduced "hidden affordances" to emphasize that certain affordances can be overlooked due to missing information. "False affordances," on the other hand consider that users might have wrong impressions about what is afforded. Gaver (1996) further demonstrated that affordances do not only exist regarding individual actions but also regarding social interactions. Such afforded sociality is inherent to a vast part of today's technology that connects users online. Technology's *social affordances* have thus been discussed as "the possibilities that technological changes afford for social relations and social structure" (Wellman, 2001, p. 228).

Another relevant contribution in the field of communication was Hutchby's (2001) conception of affordances between technological determinism and social constructivism incorporating both functional and relational aspects of *communication affordances*. In Hutchby's view, technology functionally enables or restrains actions, whereas the perception and enactment of these opportunities must be conceptualized as relational. Thus, while the material features of technology are constant, affordances are dynamic and affected by the social context of the users. Such a perspective facilitated the investigation of media technologies (Hogan, 2009;

Nagy & Neff, 2015; Wellman et al., 2003) and over the years, technology affordances have been advanced in at least three aspects: scholars introduced categories of affordances, distinguished affordances from related aspects, and further developed the concept itself.

2.1 Categories of technology affordances

To reflect the concept's level of granularity, several categories of technology affordances were introduced. Early on, Turner and Turner (2002) distinguished affordances of basic usability related to features, affordances supporting individual user tasks, and affordances that depend on and affect cultural values. Others emphasized the role of shared practices or goals and proposed affordances that reflect actions among related actors. Leonardi (2013), for instance, investigated individualized, collective, and shared affordances of technology in organizations, while Vaast et al. (2017) used connective affordances to describe collective engagement in the political realm. Weichold and Thonhauser (2020) recently further clarified the concept of collective affordances, identifying collectives as the central unit of collective action instead of the individuals with the collective in mind. To reflect how affordances are used in the communication field, Bucher and Helmond (2018) proposed a dichotomy between concrete feature-oriented low-level affordances reflecting the perspective of Norman (1988) and more abstract high-level affordances that follow the Gibsonian understanding of affordances as a relation.

2.2 Boundaries between concepts

Furthermore, scholars aimed to refine boundaries between affordances and related aspects such as features, practices, and outcomes. For example, in regards to technological properties, Postigo (2016) and Ilten (2015) advocated to clearly distinguish affordances from design features (e.g., the like button) and systems (e.g., recommender systems). Others focused on the strict distinction between affordances and their actualization (Strong et al., 2014; Volkoff & Strong, 2017) and argued that affordances should be treated as potentials for action and not as the action itself or "the state or condition that is reached after an action is taken" (Volkoff & Strong, 2017, p. 237). In a similar vein, Evans et al. (2017) emphasized that affordances only lead to behaviors and other outcomes and cannot represent behaviors or outcomes themselves. They outlined a set of threshold criteria that encourages scholars to assess a proposed affordance by confirming that it is 1) neither an object nor a feature of an object, 2) not an outcome, and 3) that it has variability. These conceptual restrictions should ensure that the mediating role of affordances between object and outcomes is recognized. Otherwise one runs the risk of deterministically relating objects to outcomes "where an object leads to the outcome without any indication of the process or reasons for the relationship" (Evans et al., 2017, p. 39).

2.3 Conceptual advancements

Aside from contributions that help to identify distinct affordances or narrow their conceptional scope, communication scholars additionally advanced the affordance concept itself. To emphasize users' active comprehension of their technology use, McVeigh-Schultz and Baym (2015, p. 1) introduced *vernacular affordances* relating to "how people themselves understand affordances in their encounters with technology." In their view, affordances are part of a sense-making process that is not linked to any particular technological artifact. Therefore, affordances "are not experienced in isolation, but rather in relation to a complex ecology of other tools with other affordances" (McVeigh-Schultz & Baym, 2015, p. 2). Nagy and Neff (2015), introduced *imagined affordances* to better reflect how "the meanings of technology are negotiated and renegotiated by users through perception, mediation, and materiality" (p. 7). Imagined affordances "emerge between users' perceptions, attitudes, and expectations; between the materiality and functionality of technologies; and between the intentions and perceptions of designers" (Nagy & Neff, 2015, p. 5). Consequently, they entail the rational and emotional aspects of users' involvement with technology and technological aspects that might be beyond the user's control (e.g., algorithms). Shaw (2017) similarly connects technology and actors by using Stuart Hall's (1973 / 1991)

model of "encoding / decoding." From that perspective, certain technological opportunities of interactivity are not only perceptible but might be encoded into design to be promoted or discouraged while users decode and assert meaning to them (Shaw, 2017). Following Nagy and Neff (2015), Shaw understands the relation between technology and users as a negotiation. In another approach that emphasizes this reciprocity between technology and actors, Davis and Chouinard (2016) advocated to be less concerned with *what* technological artifacts afford and rather ask "*how* artifacts afford, *for whom* and *under what circumstances*" (Davis & Chouinard, 2016, p. 241). Davis (2020) thus builds on the idea that technology not only allows but also constrains actions and proposes to consider *mechanisms* that entail requests for encouragement or refusal of actions. On the side of the actors, Davis (2020) introduced the term *conditions,* which considers how people perceive a set of functions and constraints (perception), vary in levels of skill (dexterity), and experience different support for certain actions regarding cultural or institutional norms (cultural and institutional legitimacy).

3 Social media research and affordances

As part of the broad application and adaption of affordances in technology and communication literature, the concept has also been used to delineate the specific characteristics of social media and social media use. In social media research, numerous conceptions of social media affordances can be traced back to boyd's (2008, 2014) initial use of the terminology to describe affordances of interaction structures on social network sites.

3.1 Affordances of interaction structures online: A technology-centered starting point

Boyd's (2008, 2011) investigation of interaction structures on social network sites is considered a fundamental contribution to the literature concerned with social media affordances (Abidin, 2021). Building on the conceptualization of content on social network sites as bits, boyd characterized the resulting "networked publics" with four affordances: persistence (content is recorded and archived), replicability (content can be duplicated), scalability (potential visibility of content is great), and searchability (content can be accessed through search) (boyd, 2011, p. 46). In addition, these affordances were linked to three dynamics inherent to such online structures (boyd, 2008, 2011): First, the potentially unlimited reach of content confronts users with invisible audiences. Second, the lack of spatial, social, and temporal boundaries induces an intermingling of social circles, entailing a so-called context collapse. Last, and dependent on the former dynamics, communication on such platforms entails a blurring of private and public.

Boyd's attribution of affordances to content and related interaction structures has been criticized as a rather technology-centered approach. Jones (2020), for instance argued that such affordances rather describe structural features and had little to do with relationality between technology and actors. The searchability of social network sites, for example, "is really just a rephrasing of the technical feature of the site as it is imagined by designers (i.e., the search bar)" (Jones, 2020, p. 280). Furthermore, concern has been raised that such affordances would run the risk of deterministic analysis, overlooking users' agency (Costa, 2018; Ilten, 2015). Although agency is often defined rather simple as the "capacity to act or cause change" (Gunn, 2011, p. 27) in communication literature, its assumed existence is crucial in major user-centered theories (e.g., the uses-and-gratification approach, Katz, Haas, & Gurevitch, 1973, or selective exposure theory, Zillmann & Bryant, 1985). User agency, in this case entailing the capacity to deliberately engage with media and to a certain extend anticipate and choose the related consequences (Klapper, 1960) is seen as particularly neglected in boyd's (2008) introduced dynamics. Costa (2018), for instance criticized the often-studied context collapse (for an overview see Davis & Jurgenson, 2014) as a Western-centric generalization that overlooks the relational component of affordances and neglects users' active social media use. In her ethnographic critique, Costa (2018) demonstrated that context collapse – in this

case on Facebook – can be circumvented with multiple accounts and does not occur in all cultural environments.

Despite concerns regarding technology-centrist tendencies of boyd's approach, the introduced affordances and outcomes have sparked significant research over the years. Scholars have adopted its premises and conceptualized affordances closer to inherent and stable features of technology. Papacharissi and Gibson (2011), for instance, introduced shareability as an attribute of social network sites that constitutes an architectural feature and Postigo (2016) similarly uses a feature-oriented understanding of affordances to identify YouTube's social affordances. However, boyd's linking of interaction structures to mostly negative outcomes for users also stimulated conceptional and empirical work aiming to account for users' active engagement with social media more comprehensively.

3.2 Social media affordances: The advancement of a user-centered perspective

In recent years, scholars have introduced additional social media affordances such as shareability, editability, accessibility, and retrievability (Valkenburg & Piotrowski, 2017). Despite the overlap in terms and the inherent connection to properties of content or interaction structures introduced by boyd (2008, 2011), scholars reframed the meaning of affordances to better reflect user agency encompassing the consideration and deliberate enactment of opportunities for action. Valkenburg and Piotrowski (2017), for instance, understood affordances as offered possibilities that increase perceived control. Consequently, they no longer referred to scalability as the potential visibility of content but to the opportunity for users "to choose the size and nature of their audience" (Valkenburg & Piotrowski, 2017, p. 221). Following this perspective, they added affordances such as identifiability (the opportunity to communicate anonymously or display one's identity) and cue manageability (the opportunity to show or hide cues to one's identity) (Valkenburg & Piotrowski, 2017). Others introduced affordances such as visibility and association (Treem & Leonardi, 2013),

self-presentation and awareness (Rice et al., 2017), or signaling (Manata & Spottswood, 2021).

Concurrently, scholars adjusted the dynamics identified by boyd (2008) with a similar intention to reflect users' evaluations and decisions in social media use. Invisible audiences, for example, were conceptualized in terms of *imagined audiences* (Litt, 2012) that guide practices and change on the level of applications or single posts (Litt & Hargittai, 2016; Stsiampkouskaya, Joinson, Piwek, & Stevens, 2021). Moreover, the often referenced context collapse was reformulated more nuanced by the distinction of *context collusion* and *context collision*, reflecting that users either intentionally or unintentionally blur various contexts (Davis & Jurgenson, 2014). In line with that shift toward a user-centered perspective on social media affordances and accompanying the conceptual work, numerous studies have applied an affordance approach to investigate how users cope with invisible audiences, intermingling social contexts, and privacy issues on social media. For example, it was demonstrated how users apply self-censorship, curate their personal online network through unfriending or unfollowing, and create multiple accounts on the same platform (Costa, 2018; Duffy & Chan, 2019; John & Gal, 2018; Triggs, Møller, & Neumayer, 2019).

3.3 Conceptual advancements

While various conceptional and empirical work has understood affordances as opportunities for action and emphasized the role of practices impacting outcomes, scholars have also advocated for more fundamental advancements to the affordance concept to better account for the distinct characteristics of social media use. Costa (2018), for instance built on a critique of the deterministic characteristics of context collapse on social media and argued that affordances cannot be known aside from their actualization because they only take shape through practices. Thus, she introduced the concept of *affordances-in-practice*, describing the "enactment of platform properties by specific users within social and cultural contexts," directly linking affordances to their actualization. Jones (2020) advocated investigating

social media affordances *as sites of contestations*, which can be better understood by considering the specificity of user groups, the textual and material status of social media, and power imbalances between users and platforms. Investigating what Facebook affords musicians, Jones (2020) demonstrated how a focus on practices of specific users provides insight into contestations enacted between social media platforms and users. Similar to Costa (2018), Jones (2020) advocated shifting the focus toward concrete outcomes as the only way affordances can be observed. Consequentially, the concept of imagined affordances (Nagy & Neff, 2015) is rejected. "If users can imagine something but not do it, then it is not an affordance, since the platform doesn't 'afford' it" (Jones, 2020, p. 281).

In contrast to these conceptual works that endorse a user-centered perspective, Bucher and Helmond (2018) introduced a *platform-sensitive approach to social media affordances*. The approach expands on the reciprocal dependencies between users and technology and additionally emphasizes the role of agency on the side of technology. While human agency is relatively uncontroversial in communication literature,[1] non-human agency has been only discussed at length in the 21st century (Gunn, 2011) and is considered increasingly important in communication theory (Jansen, 2016). Proponents of the Montreal School, for instance, allow for non-human agency by understanding actors as someone or something that makes a difference, and agency as "making a difference" (Cooren, 2006, p. 82). Actor-network theory similarly attributes agency to non-human things, proposing that they "might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid" (Latour, 2005, p. 72). Drawing on that literature, Bucher and Helmond

(2018) argue that non-human agency must be taken into account to reflect affordances' relationality: "To do the relational view on affordances full justice, we need to consider the multi-directionality of agency and connectivity at play" (Bucher & Helmond, 2018, p. 28). Due to the socio-technical nature of social media it is not only of interest what social media platforms afford users, but also what users afford platforms. Their approach thus does not only recognize actors beyond users and designers (e.g., advertisers, developers, and researchers) but furthermore emphasizes the adaptability and personalization of technological environments on the individual level and the entanglement of technology and users through feedback-loops and algorithms. Algorithms can adaptively incorporate intentional design and the engagement of end-users to display relevant content for users, increase reach of advertisements, or prolong engagement with platforms in general – all processes that give new relevance to the question of who is affording what to whom (Bucher & Helmond, 2018, p. 28). Because such mechanisms can be more or less perceived and understood by users (Bucher, 2017; Gruber, Hargittai, Karaoglu, & Brombach, 2021), they can entail what Gaver (1991) introduced as hidden affordances (Nagy & Neff, 2015).

3.4 An unresolved debate and remaining definitional confusion

Affordances promise a middle ground between technological determinism and social constructivism, that avoids an overly pronounced allocation of power toward technology or the individual (Hutchby, 2001). Yet, the success of the concept can in part be attributed to the failure to overcome such tendencies (Lievrouw, 2014; Nagy & Neff, 2015) and the debate about the right balance between the two perspectives has been ongoing ever since the concept was introduced in communication literature. Scholars (Lievrouw, 2014; Nagy & Neff, 2015) argued that within the communication field, affordances have been mainly used in terms of a user-centered perspective "placing power in the hands of the users, rather than with the technologies or their designers" (Nagy & Neff, 2015, p. 2). Conversely, the application of affordances

---

[1] The concept of agency is of course discussed in more detail and, for example, understood as "constituted and constrained by the material and symbolic elements of context and culture" (Campbell, 2005, p. 3). Consequently, agency itself, similar to affordances, can as well be understood as a relational concept. However, the related in-depth discussion is beyond the scope of this article.

has also been described as rather technology-centered (Costa, 2018; Ilten, 2015; Jones, 2020) pointing to approaches that conceptualized affordances closer to properties or architectural features of technology (boyd, 2008; Graves, 2007; Papacharissi & Gibson, 2011; Postigo, 2016). Jones (2020), for instance, recently observed the "strong tendency even within sociologically minded work to utilize affordances in order to primarily consider the novelty of technological capacity, rather than the relational nature of agents and objects" (Jones, 2020, p. 279).

Although the affordance concept gained renewed attention with the emergence of social media (Bucher & Helmond, 2018), the debate is far from resolved in social media literature. As shown above, affordances derived from properties of technology or communication structures on social network sites (boyd, 2008, 2014) were often reinterpreted to represent opportunities for action (e.g., Valkenburg & Piotrowski, 2017) and related dynamics were extended to better reflect user agency (Davis & Jurgenson, 2014; Litt, 2012). More fundamental conceptual advances continuously aimed to counterbalance deterministic tendencies and argued that affordances can only be identified through practices (Costa, 2018; Jones, 2020). Despite the valuable insight provided by a user-centered approach to social media affordances, it comes with conceptual shortcomings. More often than not, it neglects the distinction between the abstract affordances and their actualization as outcomes (Strong et al., 2014; Volkoff & Strong, 2017), disregards concepts such as hidden and false affordances (Gaver, 1991) or imagined affordances (Nagy & Neff, 2015), and fails to consider the active role of technology, that might be understood as non-human agency (Cooren, 2006; Latour, 2005) and has particular relevance with regard to socio-technological aspects of social media (Bucher & Helmond, 2018).

In light of the divergent conceptions on a spectrum from affordances as properties of technology to affordances as individual practices, it is not surprising, that the investigation of social media affordances has been characterized by a definitional confusion and inconsistent use of terms (Davis & Chouinard, 2016; Evans et al., 2017). Such in-consistencies can be exemplified using "one of the most popular presumed affordances, particularly regarding social media sites" (Evans et al., 2017, p. 42): visibility. Originally, visibility has been understood as a potential outcome of the affordance scalability (boyd, 2008). Later it has been assessed as an affordance of social media sites referring to the "potential audience who can bear witness" (boyd, 2014, p. 11) or as an affordance of social media allowing users to display personal information and to perceive information about others (Ellison & Vitak, 2015; Treem & Leonardi, 2013). Simultaneously, visibility has been operationalized restrictively to perceiving the activities of others on social media (Manata & Spottswood, 2021; Rice et al., 2017). In addition to this variety of conceptions, there is even disagreement whether visibility is an affordance in the first place. Evans et al. (2017, p. 40), for instance, argued that visibility is neither a feature, an object, nor an outcome and can be assessed as an affordance reflecting "the relational link among the object, user, and outcomes." In contrast, Volkoff and Strong (2017) understood visibility as a state that blurs action potential and outcomes and masks both actions and possible actors (in this case, provider and receiver of information). Thus, they reject visibility as an affordance and rather understand it as an outcome.

In the remainder of this article, an affordance framework is introduced that contributes to a better understanding of the conceptional work on affordances in general and promotes more precise use of concepts and terms in social media research.

4 An integrated affordance framework

This section outlines an affordance framework that integrates introduced conceptual work to convey the key aspects of an affordance perspective and facilitate access to the related concepts and literature. Affordances are conceptualized as abstract opportunities for action that are distinct from features and outcomes, as suggested by Evans et al. (2017). That understanding simplifies the simultaneous consideration of both technology (how

Figure 1:   Integrated affordance framework to approach technology and social media use
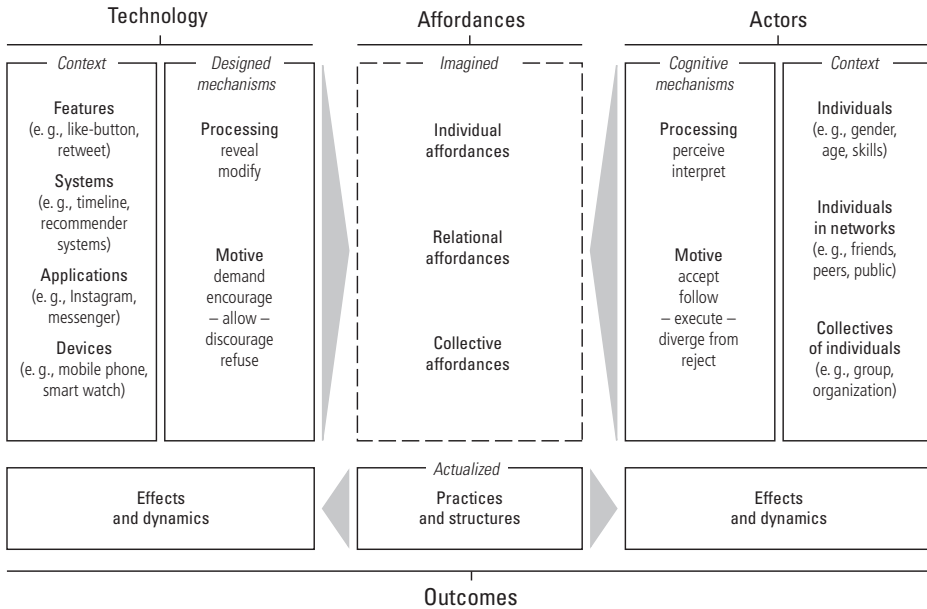
Note: The upper part of the framework centers on imagined affordances entailing the relation between technology and actors, emphasizing the relational and abstract nature of affordances (Gibson, 1979; Nagy & Neff, 2015, 2023; Shaw, 2017). Contingent on both contexts (Davis, 2020; Ilten, 2015; Postigo, 2016) and mechanisms (Costa, 2018; Davis, 2020; Davis & Chouinard, 2016; Gaver, 1991; Gibson, 1979; Norman, 2013), affordances emerge that can be identified on several levels: individual affordances primarily relate to the individual actor (Leonardi, 2013; Turner & Turner, 2002), relational affordances encompass communication affordances or social affordances (Hutchby, 2001; Wellman, 2001), and collective affordances are considered if collectives are the unit of collective action (Leonardi, 2013; Turner & Turner, 2002; Vaast et al., 2017; Weichold & Thonhauser, 2020). In the lower part of the framework, outcomes emerge from the actualization of affordances (Evans et al., 2017; Volkoff & Strong, 2017) in terms of practices (e. g., Duffy & Chan, 2019; Triggs et al., 2019) and structures (boyd, 2008, 2011) that in turn affect technology and designed mechanisms as well as actors and cognitive mechanisms through effects and dynamics (Abidin, 2021; boyd, 2008, 2011; Bucher & Helmond, 2018).

do technological artifacts introduce, impact, and provide such opportunities) and the actor (how does an actor perceive, interpret, and evaluate such opportunities). To adhere to Gibson's (1979) view of affordances as a relational construct constituted by both environment and actors, both the functional and relational aspects of technology are considered as well as the perception and interpretation of actions by actors (Hutchby, 2001).

Figure 1 depicts the integrated affordance framework that understands an affordance as an abstract opportunity of action that is constituted in technological and social contexts, contingent on designed and cognitive mechanisms, and differentiated from its actualization as outcomes that affect both technology and actors. For clarity, relevant literature is not displayed in the framework itself but referenced below, where the framework

is explained in brief (see note in Figure 1). In the following, the components of the framework are discussed in detail and illustrated with examples in social media use. Terms that are depicted in Figure 1 will be emphasized through italics when first used.

4.1 Technology

The *context* of technology is advancing previous work (Ilten, 2015; Postigo, 2016) to consider a continuum of single features (e. g., a like-button), systems (e. g., recommender systems), applications (e. g., Instagram), and devices (e. g., mobile phone). The purpose of the technological context is to explicitly distinguish technological properties from affordances (Evans et al., 2017) and to take into account that affordances can be related to multiple levels of scale (Bucher & Helmond, 2018; McVeigh-Schultz & Baym, 2015).

Designed mechanisms are located between technology and affordances and reflect the intentional design embedded in technology (Davis, 2020; Davis & Chouinard, 2016; Norman, 2013) or even non-human agency (Bucher & Helmond, 2018). Following Davis (2020), the framework presumes the two-sided nature of affordances entailing enablement and constraint and emphasizes the intentional design behind both using the term *motive*. Thus, technology not only allows but also encourages and demands, as well as discourages or refuses certain actions. While a feature to post a picture on a social media platform might encourage the user to tag people in the picture, it might discourage the user from uploading pictures that show certain content or even refuse the upload of too many pictures in a certain time frame. Technological *processing* on the other hand reveals and modifies affordances and related motives. Properties of social media technology for instance, determine if and how affordances are imagined and actualized through revealed information, reflecting what Norman (2013) referred to as signifiers. While motives determine if an action is allowed (or refused), signifiers communicate where (and how) the action should (or should not) occur. Notifications, for example, remind users about the opportunities for action at a given time (e. g., to consume new content in a feed). Additionally, technology directly modifies affordances, congruent with motives. Algorithms, for example, have a considerable impact on the affordances of social media applications. They determine which recent contacts are highlighted, what content is suggested, and which contacts get notified about posted content. Particularly, affordances that are modified by algorithms therefore might be more or less perceived and understood by users (Bucher, 2017), depending on whether and how clearly they are revealed by signifiers.

4.2 Actors

The *context* of actors distinguishes three situations in which individuals act. First, individuals might be situated on their own and interact with technology independent of others. They engage with technology depending on their personal dispositions such as gender, age, and skills. Second, individuals are connected with others and act in networks constituted apart from technology (e. g., friendship circles) or within technology (e. g., connections on social network platforms). In that case, individuals often do not act on their own but in relation to at least one other actor (e. g., indicating social behavior or communication). Finally, individuals are more explicitly connected in collectives through cooperation toward shared engagement, goals, or outcomes. Here, not the individual but the collective of individuals is in focus and "emergent behavior is fundamentally contingent upon the interacting individuals engaged in the collective, whose actions both shape and are shaped by the collective action" (Weichold & Thonhauser, 2020, p. 2). Collectives might entail companies, interest groups, or political movements.

Cognitive mechanisms relate to cognitive and emotional processes that precede and complement interaction with technology. Building on Davis (2020) and mirroring the technological mechanisms of revealing and modifying, such mechanisms entail *processing* in the form of actors' perception and interpretation. The integration of cognitive aspects reflects Norman's (2013) emphasis on perception and incorporates the missing or misinterpretation of opportunities for action (Gaver, 1991). Additionally, it considers the role of personal or cultural backgrounds (Costa, 2018; Davis, 2020) that might impact if and how actors perceive and interpret processes and motives of technology (e. g., the skill level, social norms, or cultural values). In congruence with motives on the side of technology, the evaluation of opportunities for action can be distinguished along a spectrum of possible types of *motives* of actors as well. Actors can decide to accept or follow requests, execute what is allowed, and diverge from or reject what technology encourages or demands. This distinction highlights the actor's opportunities beyond the guidance of designed mechanisms and reflects the numerous studies demonstrating users' non-conformity with what is seemingly encouraged by systems and features (Costa, 2018; Duffy & Chan, 2019; Triggs et al., 2019). Additionally, it incorporates the complete rejection of applications or devices and,

therefore, allows the inclusion of non-users and non-use as an expression of user agency (Chib, Ang, Ibasco, & Nguyen, 2021) on a conceptual level.

4.3 Affordances

In accordance with the context of actors and summarizing previously established classifications, three general categories of affordances are distinguished: individual, relational, and collective affordances. *Individual affordances* refer to opportunities for action that can be actualized by an individual independent from others and whose outcomes, for the most part, affect the individual itself. They reflect the affordances of individual user tasks introduced by Turner and Turner (2002) and Leonardi's (2013) individualized affordances. As such, they can be located on multiple levels of technology (e.g., update profile information, screening recommended content, passing time on Instagram or the mobile phone). *Relational affordances* refer to opportunities for action, whose actualization depends on at least one other actor and whose outcomes might affect the acting individual and others. They entail opportunities for social and communicative actions and thus represent social (Wellman et al., 2003) or communicative affordances (Hutchby, 2001). Such relational opportunities for action can be investigated on multiple levels of technology as well. For example, a heart button allows a single communicative act, retweets the diffusion of information among multiple actors, and applications and devices the access to one's personal network. *Collective affordances* refer to opportunities for action whose actualization depends on a coordinated effort toward a shared engagement or outcome within groups, organizations, or communities (Weichold & Thonhauser, 2020). They entail collective or shared affordances (Leonardi, 2013), connective affordances in the political realm (Vaast et al., 2017), or even cultural affordances on a societal level (Turner & Turner, 2002). On a small scale, collective affordances can be actualized through features and systems (e.g., group chats or subreddits), or applications (e.g., Slack or multiplayer games). It has to be noted that collective affordances do not reflect opportunities for action of single individuals but

rather opportunities for action of collectives constituted by individuals (e.g., to organize or to implement a shared agenda). Collective affordances therefore do not only depend on two or more individuals but "depend upon an agential system beyond individual organisms" (Weichold & Thonhauser, 2020, p. 7).

Following Nagy and Neff (2015), all opportunities for action are understood as *imagined affordances*, incorporating intentions, expectations, and perceptions of designers and actors. Affordances, therefore, exist before and without their actualization (Volkoff & Strong, 2017). The relational and variable nature of imagined affordances is particularly emphasized by including designed and cognitive mechanisms. While technology's designed processing and actors' internal processing are predominantly relevant in the constitution of imagined affordances, motives on both sides are rather important toward their actualization. However, only the interplay of all four aspects comprehensively describes what precedes the actualization of affordances. For example, a social network platform encourages a user to indicate a relation status toward another user, using a tailored notification that reveals how easy it is to accomplish and how useful the information is to others. This relational affordance, however, is modified to the effect that all other actors in a personal network are notified about its actualization. Let us assume the encouragement is perceived, and the modifying mechanism is known to the actor from experience or signifiers. If both are interpreted as intrusive and therefore rejected, outcomes emerge that entail practices bypassing that opportunity for action. In contrast to Jones' (2020) argument, one cannot deduce that therefore the affordance never existed. A different user, or the same user under other circumstances, might accept the encouragement and indicate the relation status.

Although the separation into individual, relational, and collective affordances can guide the conceptual focus or the operationalization of concrete affordances, it cannot fully reflect overlaps between categories. For example, an individual affordance (e.g., to upload a profile picture) might entail a relational component (e.g., to convey a certain

image to others) and a collective component (e. g., to impact public opinion through a uniform profile picture representing a political movement).

4.4 Outcomes

Following Evans et al. (2017), outcomes are distinct from imagined affordances and understood as their actualization. The framework distinguishes between practices and structures as well as effects and dynamics that might affect technology and related designed mechanisms, as well as actors and their cognitive mechanisms. *Practices* are the direct consequence of the actualization of individual affordances and reflect all possible individual acts (e. g., use of a feature or using an application). They affect actors on the individual level, embedded in the term effects. In addition to achieving or missing the individual target outcome of the action and a variety of unintended effects, practices might also affect future cognitive processing or motives regarding the use of technology. The often overlooked opposite direction (Bucher & Helmond, 2018) is covered as well insofar as the accumulation of practices among certain actors can affect technology and its design mechanisms. While a feature that is missed or never used might get removed from an application, algorithms continuously consider practices to reveal or modify affordances adaptively. Therefore, how users' practices inform algorithms might be understood as something users afford to platforms (Bucher & Helmond, 2018).

Structures reflect the accumulation of actualized relational and collective affordances (e. g., friendship or communication networks on social network platforms). They can have effects on individual actors, their cognitive processing as well as technology and its mechanisms. Additionally, they can moderate the impact of individual practices and perpetuate or reinforce certain effects over time, reflected in the term dynamics. Research examining structures and their influence on individual practices can be located here. Notably, this focus on structures and their dynamics, as popularized by boyd (2008), can be followed apart from an affordance approach, as was recently demonstrated with the investigation of refracted publics

and their dynamics (Abidin, 2021). To incorporate structures and dynamics into an affordance perspective would require conceptualizing them as outcomes of affordances, not as affordances themselves.

How outcomes impact technology and actors, as well as the designed and cognitive mechanisms, emphasizes the dynamic (Hutchby, 2001) and interdependent (McVeigh-Schultz & Baym, 2015) nature of affordances. The framework thus encompasses how the engagement of certain actors regarding mechanisms of a particular application might affect the variety of other applications or their features (e. g., the adoption of the popular story function of Snapchat by Instagram, WhatsApp and TikTok). Moreover, such outcomes might also impact the future interaction with technology of users or non-users.

5 Discussion and implications

What has driven the application and advancement of the affordance concept in technology and communication literature can be considerably explained with disagreement and definitional confusion regarding the appropriate attention toward technological properties or individual practices and outcomes (Lievrouw, 2014; Nagy & Neff, 2015). This was particularly the case in social media research, where influential conceptional work focused on the properties of interaction structures online (boyd, 2008) and scholars subsequently adapted and developed concepts to better reflect user agency. However, these theoretical advancements have been far more concerned with rethinking the related outcomes or the cognitive processes and practices of users than the concept of affordances itself exemplified through concepts such as context collusion (Davis & Jurgenson, 2014) or imagined audiences (Litt, 2012). Moreover, recent contributions have further distanced the affordance approach from its abstract origins and focused on actualized affordances regarding practices (Costa, 2018; Jones, 2020). In doing so, important contributions that emphasize the relational aspect of affordances (Nagy & Neff, 2015, 2023), distinguish between affordances and outcomes

(Volkoff & Strong, 2017), and consider the reciprocal relation between technology and users (Davis, 2020; Shaw, 2017) or even consider non-human agency (Bucher & Helmond, 2018), have been neglected.

The aim of the present article was to outline an affordance framework that reemphasizes the relational and abstract nature of the concept by strictly conceptualizing affordances as opportunities for action. Drawing on important conceptual work (Bucher & Helmond, 2018; Davis, 2020; Shaw, 2017), the framework reflects the technological and social contexts where opportunities for action occur and the constitution of affordances through designed mechanisms on the side of technology and the cognitive mechanisms on the side of actors. Furthermore, it distinguishes abstract affordances from their actualization regarding outcomes such as practices and structures (Evans et al., 2017; Volkoff & Strong, 2017). Although technological mechanisms and actors' cognitive mechanisms can be investigated independently, the framework emphasizes that neither can be ignored when affordances are of interest or when an affordance approach is used to investigate outcomes. The notion of imagined affordances (Nagy & Neff, 2015, 2023) embodies this premise and cements the relational and abstract nature of the concept. Therefore, it prevents the term affordances from being restrictively used in respect to "what technology allows" or "how users interact with technology."

While the presented framework facilitates the understanding of affordances and informs on relevant literature, four implications can be derived to guide future theoretical and empirical work using an affordance approach. First, it seems crucial to maintain affordances as a relational concept that links technology and actors and therefore "points both ways, to the environment and to the observer" (Gibson, 1979, p. 129). On the one hand, affordances must be conceptualized as opportunities for action that are simultaneously constituted by technology *and* actors but might exist apart from intentions of designers as well as apart from existing practices. Only such a relational understanding allows to consider a design-oriented perspective (Davis, 2020; Davis & Chouinard, 2016;

Norman, 2013) in terms of designed mechanisms and at the same time recognize actors' cognitive mechanisms (Costa, 2018; Gaver, 1991; Gibson, 1979). Given the increasing relevancy of non-human agency in communication theory (Jansen, 2016) and its crucial role in today's digital media (Bucher & Helmond, 2018), an in-depth discussion on hidden, revealed, and modified affordances as well as the potentially incomplete perception or understanding on the side of users (Bucher, 2017; Gruber et al., 2021) seems much needed. Algorithms such as recommender systems (Karimi, Jannach, & Jugovac, 2018) are in part designed to achieve a certain goal (e. g., view time, clicks) based on user's or similar users' previous practices, while these practices themselves are predicated on the users' knowledge and attitudes toward such systems (for an overview, see Mitova et al., 2022). Therefore, related affordances cannot be understood without acknowledging that reciprocal relation between technology and actors. Concepts such as Bucher's (2017) imaginary algorithms might proof useful to acknowledge the interplay between technology and users through affordances that are based on or modified by algorithms.

Second, and extending the reasoning above, it seems necessary to clearly distinguish abstract affordances from their concrete actualization. Although it continues to be valuable to investigate individual practices and emerging communication structures online and even acknowledge them affecting both technology and actors, an affordance approach is only applicable if practices and structures are considered as outcomes. Approaches that aimed to better account for user agency (e. g., Costa, 2018; Jones 2020) highlight relevant aspects that oppose deterministic interpretations of affordances related to structures. However, to blur affordances and practices (Costa, 2018) or deny the existence of affordances if no practices can be observed (Jones, 2020), similarly misconstrues outcomes as affordances and arguably rather disregards relevant conceptual work acknowledging the role of technology than adding insight to the role of the actor. First, a conceptualization of affordances too close to their actualization fundamentally complicates the consideration of designed

mechanism because such mechanisms may very well exist or are perceived by some actors even without any related practices taking place. Second, algorithmic systems where technological mechanisms are continuously updated and adapted are particularly hard to conceptualize in terms of affordances when only the eventual practices are considered, and the reciprocity between technology and actors via effects and mechanisms is not taken into account. Third, practices are usually understood as the interaction of end-users (i. e., social media users) with technology. A too strong focus on such practices thus also runs the risk of ignoring the fact that, especially in the case of social media, other actors are also involved, such as influencers, advertisers, or even the platforms themselves, rendering the question "who affords what, to whom" (Bucher & Helmond, 2018, p. 28) increasingly complex. Consequently, too much emphasis on practices of end-users in conceptional work on social media affordances would make any further investigation of additional actors difficult, if not impossible. Precisely because the temptation is great to link affordances to the utilization of most popular features (e. g., the story function) or the diffusion of types of content (e. g., ephemeral content) across platforms, it is important to maintain a clear distinction between affordances and outcomes as proposed by Evans et al. (2017) and emphasized in the presented framework.

Third, and related to an empirical application of an affordance perspective, scholars might benefit from reflecting on the technological and social contexts in which they are investigating affordances. Regarding the technological context, it might proof useful to analyze the affordances of individual features, applications, or devices in isolation. The affordance of reaching specific others with content, for instance, can be assigned to a specific feature (e. g., Tweet), a system (e. g., promoted, or algorithmic curation), an application (e. g., a messenger service), or a device (e. g., mobile phone). However, some scholars propose to approach affordances more holistically by acknowledging that people understand affordances as "nested layers at different levels of scale" (McVeigh-Schultz & Baym, 2015, p. 2). Given that social media

platforms are often used in parallel (Horvát & Hargittai, 2021; Waterloo, Baumgartner, Peter, & Valkenburg, 2018) and they increasingly overlap regarding features (e. g., ephemeral stories on Snapchat, Instagram, Facebook, and TikTok) speaks for such a perspective. Independent of the approach, it is important, however, that affordances and analysis units of the technological context are clearly distinguished, as has already been discussed in detail (Evans et al., 2017; Volkoff & Strong, 2017). In terms of the individual context, it is relevant to decide whether the actor in question is conceptualized as a single individual, an individual that is integrated into a network of actors through particular relations, or as a collective of individuals that is connected through shared engagement, goals, or outcomes. Often, this is not a given circumstance but a choice of perspective that comes with consequences for the conceptional approach and the analysis strategy. Given the increasing interest in the particularities of networked communication structures online (Bode, 2016; Thorson & Wells, 2016) and online communities (Abidin, 2021) it might be of value to investigate affordances beyond the individual acting on its own and rather investigate individuals as networked actors and collectives perceiving and enacting opportunities for action online. The introduced framework not only distinguishes the relevant contexts, but also distinguishes the relevant types of affordances of interest. Relational affordances might entail social or communication affordances that can be conceptualized and operationalized relationally. The rather ambivalent affordance of visibility for instance, might be investigated with a focus on the relational opportunity to perceive, address, or reach specific actors, clearly specifying the actor in question (the provider or receiver of information) and allowing to investigate both the role of specific features (direct message, story, post, or streams) and particular contacts (e. g., friends, peers, family, popular people). Collective affordances might be of interest across a wide spectrum of goal-oriented collectives from individuals in group chats to political movements on social media platforms. In order to approach such affordances, both the technological as

well as the social context need to be clarified, as suggested by the framework.

Finally, it seems relevant to establish and apply a terminology that best preserves the underlying conceptual understanding of affordances as relational and abstract opportunities for action. In agreement with Jones (2020), it seems helpful to use verbs and their "-ing" labels, emphasizing the potential action and the actor in question (e. g., perceiving, addressing, reaching), rather than "-ability"-nouns, that can be associated with content and features (e. g., scalability or searchability) or leave room for interpretation regarding the actor or outcome in focus (e. g., visibility). Such a differentiation seems particularly important in social media research where users are involved in their double role as recipients and communicators, and actors beyond the end-user and even non-human actors might be considered (Bucher & Helmond, 2018).

With these conceptional, empirical, and terminological implications in mind, opportunities for action on social media can be investigated as individual, relational, or collective affordances, that ultimately result in practices and structures with related effects and dynamics, when actualized. The introduced framework not only provides a useful overview of the theoretical background to consider when applying the concept of affordances but also allows researchers to identify and convey their research focus within this valuable and rich perspective.

Conflict of interest

The author declares no conflict of interests.

References

Abidin, C. (2021). From "networked publics" to "refracted publics": A companion framework for researching "below the radar" studies. *Social Media + Society, 7*(1), 1–13. https://doi.org/10.1177/2056305120984458

Bode, L. (2016). Pruning the news feed: Unfriending and unfollowing political content on social media. *Research and Politics, 3*(3), 1–8. https://doi.org/10.1177/2053168016661873

boyd, d. m. (2008). *Taken out of context: American teen sociality in networked publics* (Doctoral dissertation). University of California. Retrieved from https://www.danah.org/papers/TakenOutOfContext.pdf

boyd, d. m. (2011). Social network sites as networked publics. Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self: Identity, community and culture on social network sites* (pp. 39–59). New York, NY: Routledge.

boyd, d. m. (2014). *It's complicated: The social lives of networked teens.* New Haven, CT: Yale University Press. https://doi.org/10.12987/9780300166439

Bucher, T. (2017). The algorithmic imaginary: Exploring the ordinary affects of Facebook algorithms. *Information Communication and Society, 20*(1), 30–44. https://doi.org/10.1080/1369118X.2016.1154086

Bucher, T., & Helmond, A. (2018). The affordances of social media platforms. In J. Burgess, A. Marwick, & T. Poell (Eds.), *The SAGE handbook of social media* (pp. 223–253). London, UK: Sage.

Campbell, K. K. (2005). Agency: Promiscuous and protean. *Communication and Critical/Cultural Studies, 2*(1), 1–19. https://doi.org/10.1080/1479142042000332134

Chib, A., Ang, M. W., Ibasco, G. C., & Nguyen, H. (2021). Mobile media (non-)use as expression of agency. *Mass Communication and Society, 24*(6), 818–842. https://doi.org/10.1080/15205436.2021.1970187

Cooren, F. (2006). The organizational world as a plenum of agencies. In F. Cooren, J. R. Taylor, & E. J. Van Every (Eds.), *Communication as organizing: Empirical and theoretical approaches into the dynamic of text and conversation* (pp. 81–100). New York, NY: Routledge. https://doi.org/10.4324/9780203810682

Costa, E. (2018). Affordances-in-practice: An ethnographic critique of social media logic and context collapse. *New Media & Society, 20*(10), 3641–3656. https://doi.org/10.1177/1461444818756290

Davis, J. L. (2020). *How artifacts afford. The power and politics of everyday things.* Cambridge, MA: MIT Press.

Davis, J. L., & Chouinard, J. B. (2016). Theorizing affordances: From request to refuse. *Bulletin of Science, Technology &*

Society, *36*(4), 241–248. https://doi.org/10.1177/0270467617714944

Davis, J. L., & Jurgenson, N. (2014). Context collapse: Theorizing context collusions and collisions. *Information, Communication and Society*, *17*(4), 476–485. https://doi.org/10.1080/1369118X.2014.888458

Duffy, B. E., & Chan, N. K. (2019). "You never really know who's looking": Imagined surveillance across social media platforms. *New Media & Society*, *21*(1), 119–138. https://doi.org/10.1177/1461444818791318

Ellison, N. B., & Vitak, J. (2015). Social network site affordances and their relationship to social capital processes. In S. S. Sundar (Ed.), *The handbook of the psychology of communication technology* (pp. 203–227). Hoboken, NJ: John Wiley & Sons. https://doi.org/10.1002/9781118426456.ch9

Evans, S. K., Pearce, K. E., Vitak, J., & Treem, J. W. (2017). Explicating affordances: A conceptual framework for understanding affordances in communication research. *Journal of Computer-Mediated Communication*, *22*(1), 35–52. https://doi.org/10.1111/jcc4.12180

Gaver, W. W. (1991). Technology affordances. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 79–84. https://doi.org/10.1145/108844.108856

Gaver, W. W. (1996). Situating action II: Affordances for interaction: The social is material for design. *Ecological Psychology*, *8*(2), 111–129. https://doi.org/10.1207/s15326969eco0802_2

Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston, MA: Houghlin Mifflin.

Graves, L. (2007). The affordances of blogging: A case study in culture and technological effects. *Journal of Communication Inquiry*, *31*(4), 331–346. https://doi.org/10.1177/0196859907305446

Gruber, J., Hargittai, E., Karaoglu, G., & Brombach, L. (2021). Algorithm awareness as an important internet skill: The case of voice assistants. *International Journal of Communication*, *15*, 1770–1788. Retrieved from https://ijoc.org/index.php/ijoc/article/view/15941/3412

Gunn, J. (2011). Agency. In S. W. Littlejohn & K. A. Foss (Eds.), *Encyclopedia of communication theory* (pp. 27–30). Thousand Oaks, CA: Sage.

Hall, S. (1973 / 1991). Encoding, decoding. In S. During (Ed.), *The cultural studies reader* (pp. 90–103). New York, NY: Routledge.

Hogan, B. J. (2009). *Networking in everyday life* (Doctoral dissertation). University of Toronto. Retrieved from http://individual.utoronto.ca/berniehogan/Hogan_NIEL_10-29-2008_FINAL.pdf

Horvát, E.-Á., & Hargittai, E. (2021). Birds of a feather flock together online: Digital inequality in social media repertoires. *Social Media + Society*, *7*(4), 1–14. https://doi.org/10.1177/20563051211052897

Hutchby, I. (2001). Technologies, texts and affordances. *Sociology*, *35*(2), 441–456. https://doi.org/10.1017/S0038038501000219

Ilten, C. (2015). "Use your skills to solve this challenge!": The platform affordances and politics of digital microvolunteering. *Social Media + Society*, *1*(2), 1–11. https://doi.org/10.1177/2056305115604175

Jansen, T. (2016). Who is talking? Some remarks on nonhuman agency in communication. *Communication Theory*, *26*(3), 255–272. https://doi.org/10.1111/comt.12095

John, N. A., & Gal, N. (2018). "He's got his own sea": Political Facebook unfriending in the personal public sphere. *International Journal of Communication*, *12*, 2971–2988. Retrieved from https://ijoc.org/index.php/ijoc/article/view/8673/2410

Jones, E. (2020). What does Facebook "afford" do-it-yourself musicians? Considering social media affordances as sites of contestation. *Media, Culture and Society*, *42*(2), 277–292. https://doi.org/10.1177/0163443719853498

Karimi, M., Jannach, D., & Jugovac, M. (2018). News recommender systems – Survey and roads ahead. *Information Processing and Management*, *54*(6), 1203–1227. https://doi.org/10.1016/j.ipm.2018.04.008

Katz, E., Haas, H., & Gurevitch, M. (1973). On the use of the mass media for important things. *American Sociological Review*, *38*(2), 164–181.

Klapper, J. T. (1960). *The effects of mass communication*. New York, NY: The Free Press.

Latour, B. (2005). *Reassembling the social. An introduction to actor-network-theory*. Oxford, UK: Oxford University Press.

Leonardi, P. M. (2013). When does technology use enable network change in organizations? A comparative study of feature use and shared

affordances. *MIS Quarterly: Management Information Systems*, *37*(3), 749–775. https://doi.org/10.25300/misq/2013/37.3.04

Lievrouw, L. A. (2014). Materiality and media in communication and technology studies: An unfinished project. In W. E. Bijker, B. W. Carlson, & T. Pinch (Eds.), *Materiality and society* (pp. 21–51). Cambridge, MA: MIT Press.

Litt, E. (2012). Knock, knock. Who's there? The imagined audience. *Journal of Broadcasting and Electronic Media*, *56*(3), 330–345. https://doi.org/10.1080/08838151.2012.705195

Litt, E., & Hargittai, E. (2016). The imagined audience on social network sites. *Social Media + Society*, *2*(1), 1–12. https://doi.org/10.1177/2056305116633482

Loh, J. M. I., & Walsh, M. J. (2021). Social media context collapse: The consequential differences between context collusion versus context collision. *Social Media + Society*, *7*(3), 1–15. https://doi.org/10.1177/20563051211041646

Manata, B., & Spottswood, E. (2021). Extending Rice et al. (2017): The measurement of social media affordances. *Behaviour and Information Technology*, *41*(6) 1323–1336. https://doi.org/10.1080/0144929X.2021.1875264

McGrenere, J., & Ho, W. (2000). Affordances: Clarifying and evolving a concept. *Proceedings of Graphics Interface*, 179–186.

McVeigh-Schultz, J., & Baym, N. K. (2015). Thinking of you: Vernacular affordance in the context of the microsocial relationship app, couple. *Social Media + Society*, *1*(2), 1–13. https://doi.org/10.1177/2056305115604649

Mitova, E., Blassnig, S., Strikovic, E., Urman, A., Hannak, A., de Vreese, C. H., & Esser, F. (2022). News recommender systems: A programmatic research review. *Annals of the International Communication Association, 47*(1), 1–30. https://doi.org/10.1080/23808985.2022.2142149

Nagy, P., & Neff, G. (2015). Imagined affordance: Reconstructing a keyword for communication theory. *Social Media + Society*, *1*(2) 1–9. https://doi.org/10.1177/2056305115603385

Nagy, P., & Neff, G. (2023). Rethinking affordances for human-machine communication research. In A. L. Guzman, R. McEwen, & S. Jones (Eds.), *The SAGE handbook of human-machine communication* (pp. 273–279). London, UK: Sage.

Norman, D. A. (1988). *The psychology of every day things*. New York, NY: Basic Books.

Norman, D. A. (2013). *The design of everyday things*. New York, NY: Doubleday.

Papacharissi, Z., & Gibson, P. L. (2011). Fifteen minutes of privacy: Privacy, sociality, and publicity on social network sites. In S. Trepte & L. Reinecke (Eds.), *Privacy online* (pp. 75–89). Berlin, Germany: Springer. https://doi.org/10.1007/978-3-642-21521-6

Postigo, H. (2016). The socio-technical architecture of digital labor: Converting play into YouTube money. *New Media & Society*, *18*(2), 332–349. https://doi.org/10.1177/1461444814541527

Rice, R. E., Evans, S. K., Pearce, K. E., Sivunen, A., Vitak, J., & Treem, J. W. (2017). Organizational media affordances: Operationalization and associations with media use. *Journal of Communication*, *67*(1), 106–130. https://doi.org/10.1111/jcom.12273

Shaw, A. (2017). Encoding and decoding affordances: Stuart Hall and interactive media technologies. *Media, Culture and Society*, *39*(4), 592–602. https://doi.org/10.1177/0163443717692741

Strong, D. M., Johnson, S. A., Tulu, B., Trudel, J., Group, R. M., Volkoff, O., … Garber, L. (2014). A theory of organization-EHR affordance actualization. *Journal of the Association for Information Systems*, *15*(2), 53–85.

Stsiampkouskaya, K., Joinson, A., Piwek, L., & Stevens, L. (2021). Imagined audiences, emotions, and feedback expectations in social media photo sharing. *Social Media + Society*, *7*(3), 1–19. https://doi.org/10.1177/20563051211035692

Thorson, K., & Wells, C. (2016). Curated flows: A framework for mapping media exposure in the digital age. *Communication Theory*, *26*(3), 309–328. https://doi.org/10.1111/comt.12087

Treem, J. W., & Leonardi, P. M. (2013). Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association*, *36*(1), 143–189. https://doi.org/10.1080/23808985.2013.11679130

Triggs, A. H., Møller, K., & Neumayer, C. (2019). Context collapse and anonymity among queer Reddit users. *New Media & Society, 23*(1), 5–21. https://doi.org/10.1177/1461444819890353

Turner, P., & Turner, S. (2002). An affordance-based framework for CVE evaluation. In X. Faulkner, J. Finlay, & F. Détienne (Eds.), *People and computers XVI – Memorable yet invisible* (pp. 89–103). London, UK: Springer. https://doi.org/10.1007/978-1-4471-0105-5

Vaast, E., Safadi, H., Lapointe, L., & Nagoita, B. (2017). Social media affordances for connective action: An examination of microblogging use during the gulf of mexico oil spill. *MIS Quarterly: Management Information Systems*, *41*(4), 1179–1205. https://doi.org/10.25300/MISQ/2017/41.4.08

Valkenburg, P. M., & Piotrowski, J. T. (2017). *Plugged in: How media attract and affect youth*. New Haven, CT: Yale University Press. https://doi.org/10.12987/yale/9780300218879.001.0001

Volkoff, O., & Strong, D. M. (2017). Affordance theory and how to use it in IS research. In R. Galliers & M.-K. Stein (Eds.), *The Routledge companion to management information systems* (pp. 232–246). London, UK: Routledge. https://doi.org/10.4324/9781315619361-18

Waterloo, S. F., Baumgartner, S. E., Peter, J., & Valkenburg, P. M. (2018). Norms of online expressions of emotion: Comparing Facebook, Twitter, Instagram, and WhatsApp. *New Media & Society*, *20*(5), 1813–1831. https://doi.org/10.1177/1461444817707349

Weichold, M., & Thonhauser, G. (2020). Collective affordances. *Ecological Psychology*, *32*(1), 1–24. https://doi.org/10.1080/10407413.2019.1695211

Wellman, B. (2001). Physical place and cyberplace: The rise of personalized networking. *International Journal of Urban and Regional Research*, *25*(2), 227–252. https://doi.org/10.1111/1468-2427.00309

Wellman, B., Quan-Haase, A., Boase, J., Chen, W., Hampton, K., De Diaz, I. I., & Miyata, K. (2003). The social affordances of the internet for networked individualism. *Journal of Computer-Mediated Communication*, *8*(3). https://doi.org/10.1111/j.1083-6101.2003.tb00216.x

Zillmann, D., & Bryant, J. (1985). Selective exposure to communication. In D. Zillmann & J. Bryant (Eds.), *Selective exposure to communication*. London, UK: Routledge. https://doi.org/10.4324/9780203056721