SI: Culture Digitally

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Social Media + Society
July-December 2015: 1–9

DOI: 10.1177/2056305115603385
sms.sagepub.com
SAGE

Imagined Affordance: Reconstructing a Keyword for Communication Theory

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Abstract

In this essay, we reconstruct a keyword for communication—affordance. Affordance, adopted from ecological psychology, is now widely used in technology studies, yet the term lacks a clear definition. This is especially problematic for scholars grappling with how to theorize the relationship between technology and sociality for complex socio-technical systems such as machine-learning algorithms, pervasive computing, the Internet of Things, and other such "smart" innovations. Within technology studies, emerging theories of materiality, affect, and mediation all necessitate a richer and more nuanced definition for affordance than the field currently uses. To solve this, we develop the concept of imagined affordance. Imagined affordances emerge between users' perceptions, attitudes, and expectations; between the materiality and functionality of technologies; and between the intentions and perceptions of designers. We use imagined affordance to evoke the importance of imagination in affordances—expectations for technology that are not fully realized in conscious, rational knowledge. We also use imagined affordance to distinguish our process-oriented, socio-technical definition of affordance from the "imagined" consensus of the field around a flimsier use of the term. We also use it in order to better capture the importance of mediation, materiality, and affect. We suggest that imagined affordance helps to theorize the duality of materiality and communication technology: namely, that people shape their media environments, perceive them, and have agency within them because of imagined affordances.

Keywords

communication theory, affordance, materiality, affect, mediation, social construction, technological determinism

For this essay, we turn to one commonly used term in that literature that warrants significant reconsideration—if not reconstruction—*affordance.* A widely used keyword for communication technology studies, affordance nevertheless lacks a clear definition in the communication and media studies literature. We will argue that communication scholars have misappropriated an outdated definition of affordance from psychology that neither fits with how the term is used in that discipline nor helps communication scholars advance theory of our own. Emerging approaches to materiality within communication, attention to affect and emotion, and renewed interest in the processes of mediation all necessitate a richer and more nuanced notion of technological affordance than the communication field currently uses. When scholars use "affordances and constraints" to describe the qualities of communication technologies and media, they tap into concepts rooted in a history of scholarly conversations. However, we would argue the phrase now fails to capture the complexity of the interactive production of the stuff of communication and the richness of the emerging new scholarship that gives serious attention to the materiality, affect, and media on which communication are built.

As a corrective, we propose the concept *imagined affordance*. We mean imagined affordance in three distinct ways. First, communication scholars have imagined a consensus or clarity around the term "affordance," which lacks in reality a clear definition within the communication literature. Second, imagined affordance evokes the imagination of both users and designers—expectations for technology that are not fully realized in conscious, rational knowledge but are nonetheless concretized or materialized in socio-technical systems. Affordances are, we argue, in large part imagined by users, a meaning of affordance that we get from psychology that has

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been lost within the field of communication. Third, imagined is meant to trouble the use of affordance as static and, ultimately, dependent upon humans and their actions. Communication scholarship has used affordance in a way that favors the active and rational participation of human actors' afforded actions by the technology around them. In other words, the phrase *affordances and constraints* in communication and media studies almost always refers back to how human users are afforded or constrained in their seemingly conscious and rational actions. Communication theory deserves a richer theory of the materiality of media, the role of affect, and the process of mediation than this. Communication research on emerging "non-human" communication of algorithms, wireless devices in the Internet of Things, and data flows also needs expanded ways of theorizing socio-technical affordances for emerging technologies.

By anchoring *imagined affordances* in a process that is simultaneously material and perceptual, we are looking for a term that helps scholars to reflect technological environments' material qualities that mediate affective experiences. This will help bridge human use and the "thingness" of technologies, platforms, algorithms, data, and media. In the following, we briefly present some contemporary theories of "materiality," mediated experience, and the emotional aspects of technology use, with a particular attention to the ways these theories may help us to gain a better understanding of the affordances of human–technology interaction. We introduce imagined affordance as a theory that better incorporates the material, the mediated, and the emotional aspects of human–technology interaction.

Imagined Consensus: Affordance in Communication Technology Studies

The term *affordance* is still an ambiguous concept in communication and has multiple, and often contradictory, definitions. In a broad sense, the term "technological affordances" establishes material qualities of technologies and media as being constituted at least partly outside the communicative, mediate, and affective processes of the people who use them. The way affordance is used within the communication technology literature is most often as qualities, features, or cues within a technology (e.g. Aakhus, 2007; Graves, 2007; Leonardi, 2011; Postigo, 2014). Within the field of communication, affordance has been used to describe how a medium or a tool affords uses to individuals. Affordance used thus, unfortunately, too often serves to separate questions of the materiality of technology from discussions of social construction and human agency, rather than to engage materiality with any scholarly seriousness, despite the fact that such work is taking place within the discipline.

Many times, affordance is either used as synonymous with "features" of technology (Vitak, 2015) or is defined in the negative, referring to all that is *not* the work of (human) users, their frames, their expectations, or their definitions. However, the history of the use of affordance is complicated by communication's uneasy relationship to technology determinism and social constructivism. Instead the term, with some recent exceptions, has been used to point to what technology makes possible for users—ignoring the black boxes, the algorithms, and the automatic. In other words, the complex socio-technical systems that act with and sometimes without or despite us are not covered by a theory of affordances that places the emphasis on what tools afford to people.

Affordances have provided a kind of middle ground between technological determinism and social construction, a move that allowed researchers to point to the materiality or functions of technology while reminding their readers that these functions are always subsumed by users' actions (Graves, 2007; Neff, Jordan, McVeigh-Schultz, & Gillespie, 2012). Suggesting a technology *affords* social action has been seen as "a nondeterministic way out of these two polar interpretations of technology use" (Hogan, 2009, p. 24). The concept of affordance has become useful in communication *because*, not despite, of the fact that scholars have not yet moved theory beyond "determinisms" (Lievrouw, 2014), although the rise of "new materialisms" is changing this. Still, the concept of affordance always carries with it this whiff of the determinism debate, giving "conceptual substance to seemingly contradictory positions of social construction and technological determinism" (Jordan, 2008, pp. 139–140). For communication scholars, this divide between the social and the technical has been likened to a pendulum swung toward social constructionists and various behaviorisms and away from technological determinism, so much that our attentions may have swung too far in the other direction (Lievrouw, 2014; Sterne, 2014). In other words, within technology studies, *affordance* has had to carry a weight counterbalanced to technological determinism. Although theorists stress that social and material factors are equally important, when it comes to technology uses, they tend to favor one or the other (Leonardi & Barley, 2008), and in communication, the social has clearly won.

Thus, the communication field has used affordance to describe communication technologies as placing power in the hands of the users, rather than with the technologies or their designers. Studies of the web focused on how the Internet affords social uses for users (Hogan, 2009; Wellman et al., 2003). A social affordance of a communication technology "creates possibilities" for "everyday life" (Wellman et al., 2003). Social affordances are "the social structures that take shape in association with a given technical structure" (Postigo, 2014, p. 5). They "alter communicative practices or habits" (Schrock, 2015a, p. 1232). Social affordances are media "cues for action that cut across offline contexts . . . about who, where, and when individuals are communicating with each other . . ." (Hogan, 2009, p. 210). In communication theory, affordances, ironically, most frequently refer to what users and their sociality get from a technology.

This emphasis on what technology affords users poses another problem. This use of affordance cannot adequately capture features that are *not* about user action or sociality. Nor does it include users' perceptions, expectations, or misperceptions as informing affordance. Algorithms, for example, increasingly select which messages we see online from friends and media producers alike. As Gaver (1991) would put it, for most users algorithms structure "hidden affordances," those of which users are unaware. For example, more than half of Facebook users are not aware that their Facebook News Feed is structured by an algorithm (Eslami et al., 2015). Facebook has a capacity (acting in a socio-technical system) that many users do not understand, use, or act upon. When shown their friends' posts without the News Feed algorithm, many of these unaware users blamed themselves, not the algorithm, for having missed their friends' important posts. In the extreme case, "whenever a software developer in Menlo Park adjusts a parameter [in the Facebook algorithm], someone somewhere wrongly starts to believe themselves to be unloved" (Eslami et al., 2015). Technology studies scholars use affordances to refer to what *users* can do with technology and in the process inadvertently describe affordances as dependent on users' actions, awareness, and perceptions, rather than how tools shape sociality.

Affordances as Part of the "Imagination": Affordance Theory's Psychological Roots

When it appeared in the psychology scholarship, affordance originally described the way human beings and animals perceive their surroundings. A cave is used as a classic example of affordance within psychology. A cave is immediately, easily, and concretely understood as affording shelter. Gibson first used affordance to refer to environmental properties that offer specific actions for people who perceive them as such and suggested that people primarily perceive the affordances of objects, not their qualities. We perceive caves, Gibson would argue, first as shelter and then as stone. The idea of affordance was to capture the dynamic and complementary interaction between organisms (here meaning humans, mammals, and cognitively complex organisms) and their environment. The term has since become a fundamental construct in the subfield of ecological psychology (see also Bickhard & Richie, 1983; Stoffregen, 2000; Wells, 2002). Affordances are part of the rich contextual information available in the environment that helps organisms act in response to the challenges of the world.

Affordances may be present for only one individual or a group of individuals but not for others. This is the key for our argument. Affordances are simultaneously waiting in an environment and simultaneously waiting to be recognized, especially by specific individuals. Gibson introduced the concept of *niche* to refer to a special set of affordances that are only relevant for a particular type of perceivers (such as humans) or that differentiate among different types of users. Niche highlights the fact that affordances are not merely material qualities but that they also depend on the interaction between perceivers and their environments. A rock affords a human and a lizard very different things (Schrock, 2015b). Affordances were never theorized as being stable or inherent properties external to perception. And although an environment is full of potential functional properties that help observers to act, human beings or animals tend to actualize only specific affordances (Ben-Zeev, 1984; Heft, 1989).

Affordances exist even if the perceiver is not present because they are the innate characteristics of the environmental structure. Affordances may also be treated as preconditions or constraints for activities: affordances do not imply that certain behaviors will occur, rather they contribute to the (recognizable) possibility of that activity (Greeno, 1994). In other words, an environment can incorporate an entire realm of potential activities. As Sanders (1997) puts it, "if the organism in question can think and imagine, that expands the horizon of activity astronomically into the realm of the conceptual and the realm of imagination" (p. 108). Social affordance theory in psychology focuses simultaneously on both the features of the environment and the cognitive attributes of the perceivers, targeting affordances manifest in complex socio-technical interactions (Zebrowitz, 2002). Perception is a critical facet of social affordance theory that is missing in communication scholarship.

Affordance is based on a contradiction that it presumes, but does not confront, about the distinction between matter and mind, between materiality and discourse (Neff et al., 2012, p. 309). But Gibson (1986) and to some extent the scholars of design who followed recognized the importance of affordances as being "both/neither":

> An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property or a subjective property; or it is both if you like . . . It is equally a fact of the environment and a fact of behaviour. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and the observer. (p. 129)

Lost in translation when affordance migrated to communication technology studies is this idea of affordance as *both/and*, both environmental *and* perceptual, both conceptual *and* imagined.

Imagining Uses: Technology Design's Post-Gibsonian Perspective

Now our environments are mediated. In other words, a mobile phone (or other communication device) is not a rock

(Schrock, 2015b), and psychology's definition of affordance may inadvertently emphasize users' intentions and actions while missing nuances of a technology's design and materiality. We suggest that by revisiting psychology's original meaning of affordance communication, scholars can address how people form expectations toward technology and that this may complicate the boundaries between the materiality of technologies and media and users' perceptions and actions.

Originally, affordance theory was developed to describe how organisms perceive their environment and perform action. Organisms tend to actualize diverse actions depending on how they perceive their surroundings. But the design studies field has long been interested in how to create things that can be easily understood by users in specific, intended ways. In other words, design has used affordance theory to highlight the role of the designer: designer theory emphasizes affordance as enabling users' possibilities and constraining their choices (Chan, 2013; Gaver, 1991; Lintern, 2000; Lintern, Waite, & Talleur, 1999; Pols, 2012; Stanfil, 2014). However, the use of affordance in design theory refers to pushing users to the uses that were designed and intended. Norman (1999) suggested that too often scholars used *affordances* when they meant *perceived affordances* and that designers in general cared "more about what actions the users perceive to be possible than what is true" (p. 39). The scope of the possibilities, meaning the interaction between uses, users, and designers, is broader. New social theories of materiality are exciting because they address the possibilities of matter in social life. Yet, most of the focus on materiality still has human agency somewhere lurking around affordances, whether looking at the "politics" encoded into artifacts or the ways that material works against or despite or in reaction to design.

Affordances are not simply the social rules of the game. They "reflect the possible relationships among actors and objects: they are properties of the world. Conventions, conversely, are arbitrary, artificial, and learned" (Norman, 1999, p. 42). This idea of affordances being "in the world" is a key concept from environmental psychology. Once put in place, whether by nature or by design, affordances become the way that material things act in social relationships.

This matters for describing communication technology because affordance as a theoretical label has come to stand in for the social and contextual nature of the material world. Affordances within communication theory afford some human actor something. An example: Facebook has social affordances that allow users to read their friends' updates in the News Feed. Within psychology, affordances are *created* in interaction between tools and users and *depend* upon users' perception as much as tools' qualities or features. But psychology overlooks the importance of mediation—the ability of humans to shape their communicative environments and thus, in part, make what they perceive. Facebook affords users the ability to make some choices to influence their News Feed, which shapes their experience of the mediated environment. Within design, tool makers build affordances into their tool. Facebook designers decide what affordances they want to build within News Feed. As a result, users are left with little insight into their complexity. As Eslami et al. (2015) phrased it, "With no way to know if their knowledge of these invisible algorithms is correct, users cannot be sure of the results of their actions" (p. 1). Extending affordance theory can help communication theorists point to the construction, mediation, and materialization of power and social relationships.

Imagined Users and Imagined Uses

Communication scholars are well practiced in theorizing the spaces in between messages' production and reception. Thus, affordance theory can be used to address the differences between the production and use of technologies, and some of this work is underway. Affordances "are a form of power" (Jordan, 2008, p. 139). Affordances can reveal how to think about "who has the power to define how technologies should be used" and the dominant, negotiated, and oppositional positions in relation to them (Shaw, 2015). Communication scholars can take up the question of who or what "kinds of people are most likely to notice affordances and take advantage of them" (Hogan, 2009, p. 48). For example, Facebook affords different things to different users—by design and with differing effects.

Affordances can include the expectations and beliefs of users, whether or not they are "true" or "right." Affordances can and should be defined to include properties of technologies that are "imagined" by users, by their fears, their expectations, and their uses, as well as by those of the designers. What people expect out of their data, the "data valences" (Fiore-Gartland & Neff, 2015), are important aspects of the affordance of socio-technical systems.

Designers, too, have expectations. They rely on imagined users, "the rhetorical base upon which designers and planners build convincing design narratives and through which they are able to exert influence over the design and planning process" (Ivory, 2013, p. 438). Imagined users are a "mirror" to real users refracted through designers' "motivations and assumptions" (Ivory, 2013). Capturing the latent, assumed, false, hidden, masked, and blackboxed muck of socio-technical systems is the project of troubling the term "affordance."

Imagination can serve an interesting purpose within theories of technological affordance. The language of imagination helps to clarify the turn that we suggest should be made to advance affordance theory. Gibson (1986) argued that *imagery* can be considered as an extension of perceptual knowledge, which is "not so continuously connected with seeing here-and-now as perceiving is." Imagery consists of (1) sensory or perceptual experience, (2) the ability to consciously reflect upon the contents of imagination, (3) being independent of external stimuli, and (4) behaviors based

upon mental images are similar to the behaviors based upon perceptions (Richardson, 1983). For psychologists, imaginative processes play important role in developing realistic understandings and are considered an integral part of perception (Turner, 1996). Without imagination, there is no rationality.

This notion in psychology of imagination as not fully rational but critical for rationality also affects how people perceive affordances and may modulate their preferences (Boschker, Bakker, & Michaels, 2002). Imagination reshapes how people use and perceive technology, and technology affects imagery in often unexpected or chaotic ways (Sneath, Holbraad, & Pedersen, 2009). The point is not solely what people think technology can do or what designers say technology can do, but what people *imagine* a tool is for. Imagination connotes perception, not just rationality, a distinction that is missing in how communication scholars currently use the term "affordance."

The Concept of Imagined Affordance

There is a concretization of users' perceptions, emotions, and experiences into the qualities or features of media technologies, which is not captured by the way scholars currently use the term "affordance." For example, Facebook privacy settings may or may not be adaptable by users, but there is value in examining the pragmatics of such adjustments and settings—as users practice them—as the "affordances" of Facebook. Users may have certain expectations about their communication technologies, data, and media that, in effect and practice, shape how they approach them and what actions they think are suggested. These expectations may not be encoded hard and fast into such tools by design, but they nevertheless become part of the users' perceptions of what actions are available to them. This is what we define as *imagined affordance*, as opposed to a more rigid and fixed notion of affordance that communication technology scholars have struggled with.

Imagined affordances emerge between users' perceptions, attitudes, and expectations; between the materiality and functionality of technologies; and between the intentions and perceptions of designers. With imagined affordances, we try to bring together the various ways of theorizing affordance to create a concept flexible and robust enough for the complex emerging socio-technical relationships in social life.

An example of this could be how users have imagined affordances from their Facebook News Feed as offering objective reporting of their friends' posts, rather than an algorithmically encoded parsing of them. The imagined affordance of the News Feed content offers its users different potential actions, and it presents communication theory with another example to clarify the split between users and their tools within the use of *affordance*. By drawing on users' perception for the definition of technologies' qualities, imagined affordance opens up ways that misunderstandings, misperceptions, and misinterpretations are not technical bugs but software and hardware features that encode possibilities for action. In this way, imagined affordance shares a theoretical affinity with the "politics of platforms" (Gillespie, 2010). Because imagined affordance specifically draws on adaptation in practice and in interaction, the theory allows more space for communication technology researchers to describe technologies and media that are themselves adaptive, learning, responsive, and changing along with the users they share an environment with, such as algorithms that are far from "agnostic" about their human users (Crawford, 2013; Gillespie, 2013). It is in this sense that we hope theorists and researchers alike get with imagined affordances a more powerful set of tools to address adaptive, pervasive, and ubiquitous sensing and computing as communicative processes shaped in interaction with users through mediated, material, and affective processes.

Perhaps more importantly, we are trying to carve out a place within communication technologies studies for an evolved affordance theory that addresses the emerging theoretical and empirical concerns of the communication field. We hope that imagined affordance may help other scholars create new models for the social, technological, and psychological interaction determining technologies' use in practice and in social settings. Three facets of communication theory illustrate that scholars need a more holistic affordance theory, and we take these in turn.

Mediation: Platforms Matter

Communication devices and online platforms also mediate experience for users (Timmins & Lombard, 2005), helping to construct perceptions (de Kort, Meijinders, Sponselee, & IJsselsteijn, 2006). Mediated experience is one way that the affordances of communication technologies differ from the affordances of other types of tools and environments. Take, for instance, the following passage:

> When they power up their computers, launch a program, write e-mail, or log onto their online service, users often feel—consciously or subconsciously—that they are entering a "place" or "space" that is filled with a wide array of meanings and purposes. (Suler, 1996, p. 105)

Technologies are often considered as artifacts that enable users to extend their senses and their mind. Through interaction in digital environments, individuals can be present in and navigate through multiple places or sites. Users tend to perceive communication media as an invisible entity that is mediated by the human sensory, cognitive, and affective processes (Renò, 2005). The medium, so important for perception, becomes invisible to it. Technologies have a similar attribute in that they transform individuals' experience and thus to some extent add new dimensions to human perception (Mangen, 2008).

Users often approach online mediated environments as if they were stable or fixed, even when they are adaptive or responsive. Mediated environments provide constraints and affordances that might differ from what users' experience and perceive under different conditions (Gottschalk, 2011), but affordance theory was originally developed to understand the relationship between action and perception outside of mediated experience. Users need to explore mediated environments socially, culturally, and cognitively before they can use them effectively. Affordances in mediated environments are subject to cognitive as well as emotional processes. We may feel an online site is less adaptive than it actually is. The perceptions of affordances are as much socially constructed for users as they are technologically configured. For example, the majority of Facebook users are not aware that their News Feed content is filtered by an algorithm, although they are all "exposed to the algorithm outputs" (Eslami et al., 2015). More use of Facebook, social comparison with other users, and active use of the adjustments all influence why some people perceive the effects of the algorithm and others do not. In other words, users' perception of virtual environments is influenced by the technological configuration of the environment and their own beliefs and expectations.

Because of the communication field's central commitment to the process of mediation, there should be an even bigger role for perception in our definition of affordance. This is also important for rethinking how users' abilities to adapt or modify systems may at times be overshadowed by their own perceptions that such systems are less adaptable than they actually are. Imagined affordance could help scholars wrestle with the notion of affordance as mediated and shaped in relationship to perception, imagination, design, and use.

Materiality: Things Are Interactive

With a stronger focus on the materiality of technologies, "we should be able to speak more precisely about why people do the things they do with technology" (Leonardi & Barley, 2008, p. 172). Leonardi (2010) argues that materiality can be understood as (1) matter, (2) practical instantiation, and/or (3) significance. He argues that "material" can be best defined as "a certain extent of significance," specific features or aspects of digital or technological artifacts that are important for accomplishing goals or purposes. Material characteristics of artifacts are not all equally significant to everyone, and not all material features are important for particular purposes.

Thus, the materiality of things is shaped in part by their sociality. For instance, Hutchby (2001) argues that affordances are relational entities that are constituted through interactions between human beings and the material characteristics of things. Hutchby argues that affordances of a particular artifact are characterized by the context in which individuals interact with them and that they are dynamic entities that depend on the social context. Material features of technologies, on the other hand, are constant variables that exist independently from human beings. Affordances link the capabilities of technology artifacts to the users' purposes (Faraj & Azad, 2012). Technologies are not just bundles of features, and affordances are not about physical or digital objects (Fayard & Weeks, 2007). They are built around various programs of actions that are both determined by human and non-human activities (Latour, 1992), permitting and encouraging some activities while prohibiting and preventing some others (Huvila, 2009).

Affordances manifest in the interaction between human beings and the particular piece of technology they use, and even in digital settings, these uses have a marked materiality about them. Hodder (2012) argues that human beings tend to form a wide range of dependencies (e.g. physical, social, and psychological) on things, and these dependencies are closely related to constraints. Such human-thing dependencies do not originate from the inherent features of things, but rather are embedded in these interactions (Hodder, 2012). The interactional and dynamic nature of constraints help individuals create new meanings and transform the former ones through manipulating objects (Fowler, 2004; Hodder, 2012). Even online environments have material characteristics that are perceived by users as having a stability that mirrors the offline world, and they interact with them similarly (Lehdonvirta, 2010).

Users' social context, abilities, and purposes define their interactions with technologies. Imagined affordance can help scholars think through the way that affordances are formed in interaction between users, designers, and the physical and digital materiality of technologies.

Affect: Feelings Shape Social Worlds

Human–technology interaction is shaped by users' emotions and perceptions to a great extent, and design and aesthetic characteristics, devices, or digital products may evoke certain emotions in users (Lim et al., 2008; Mick & Fournier, 1998; Thüring & Mahlke, 2007). Technological affordance theories have tended to overlook these emotional, affective, and "non-rational" elements of the relationship between users and technologies. In the notion of affordance in psychology, individuals are likely to engage skillfully with their surroundings in a form of unreflective action that is solicited by the environment (Ingold, 2000). Emotional states, such as anxiety or nerves, influence how people perceive the environment and perform actions. Anxiety, for example, decreases the accuracy of information processing and thus worsens the accuracy of affordance perception (Bootsma, Bakker, van Snippenberg, & Tdlohreg, 1992).

While affective or emotional states have been considered in communication and technology design research, they are rarely integrated into how we think about affordances. In

other words, the qualities of objects, including technologies, are related to certain emotional experiences of their users. Some features of technological artifacts may serve as "emotional clues" for users. Users may experience technologies as having emotions or being "social actors" and interact with technologies as if the tools themselves were social beings, even unconsciously (Nass & Moon, 2000; Reeves & Nass, 1996). Users may form strong emotional relationships with technologies and can project certain emotions or affective contents onto them, treating them as "relational entities" (Turkle, 2004). Psychologically informed models for human emotions are being used for user experience research and other design research, in effect helping to build tools to better fit users' emotional expectations and perceptions such as these (Saariluoma & Jokinen, 2014). This means that the technological affordances of new versions of communication technologies, then, may become constituted partly by the perceptual and affective states of previous versions' users. This is a far cry from technological affordances being independent of users' influence, perception, or emotional state. Imagined affordance could bring back into the scholarly conversation the importance of imagination, non-rational thought, and perception for describing the process of the formation of technological affordances.

Research in technology is addressing the impact of mediation, materiality, and affect, but affordance theory has yet to catch up. Users treat technological devices as significant physical entities (materiality), they interact with them through constructed perceptions (mediated experiences), and they express strong conscious or unconscious emotions toward them (affect) that are only partly evoked by the physical features of technological artifacts. Imagined affordance may be one way to synthesize these.

Conclusion

We argue that existing technology affordance theories need to be extended in order to understand the ways individuals perceive, approach, and use technological artifacts. Affordances are not only related to the design features of devices but also to the psychological and social characteristics of human–technology interaction. We suggest the term *imagined affordance* to better incorporate the material, mediated, and emotional aspects of technological artifacts and their implications for affordance perception tendencies. We use imagined affordance to differentiate from previous uses of affordance, while maintaining the attention to the qualities of technologies, to move toward more nuanced theorizing at the intersection of social processes and technological materiality.

Imagined affordances, as we have set forth here, include these tandem processes in the analysis and resolve a conflict or contradiction that many scholars have struggled with. Rather than reify a (false, or at least not wholly true) dichotomy between the "social" and the "technological," imagined affordances enable scholars to expand and explore this space without abandoning the territory to social and culturalist constructivism. Rather than bracket materiality, imagined affordance takes it as the communicative ground through which the meanings of technology are negotiated and renegotiated by users through perception, mediation, and materiality.

Imagined affordances help us to understand the complex nature of human–technology studies with more clarity. Theoretically, imagined affordance may give other researchers a way to think seriously through the matter of technology and serve to encourage scholarship addressing "new materialisms." For research, it offers scholars a framework for studying the gap between users' experience of technologies and the features or qualities of the technology and helps to identify the space between users' perception and the reception of technologies. Imagined affordance helps us connect technologies to their use in practice and in the wild.

Acknowledgements

We would like to thank Andrew Schrock, Jonathan Sterne, Paul Frosh, Nick Couldry, Hector Postigo, Tarleton Gillespie, Leah Lievrouw, Tim Jordan, Joshua McVeigh-Schultz, Zizi Papacharissi, and extremely helpful anonymous reviewers for their insights and comments. This paper was presented at the 2015 65th Annual International Communication Association meeting. We also would like to gratefully acknowledge the support of the CEU Institute for Advanced Study; the Center for Data, Media & Society; and Espresso Embassy in Budapest.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received support from the Center for Data, Media & Society and the CEU Institute for Advanced Study.

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