



Journal of Documentation

Feeling documents: toward a phenomenology of information seeking

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Article information:

To cite this document:

Patrick Keilty, Gregory Leazer, (2018) "Feeling documents: toward a phenomenology of information seeking", Journal of Documentation, Vol. 74 Issue: 3, pp.462-489, <https://doi.org/10.1108/JD-09-2016-0113>

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Feeling documents: toward a phenomenology of information seeking

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Received 28 September 2016
Revised 4 May 2017
Accepted 15 May 2017

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Abstract

Purpose – The purpose of this paper is to present two models of human cognition. The first narrow model concentrates on the mind as an information-processing apparatus, and interactions with information as altering thought structures and filling gaps in knowledge. A second model incorporates elements of unconsciousness, embodiment and affect. The selection of one model over the other, often done tacitly, has consequences for subsequent models of information seeking and use.

Design/methodology/approach – A close reading of embodied engagements with pornography guided by existential phenomenology.

Findings – The paper develops a phenomenology of information seeking, centered primarily around the work of Merleau-Ponty, to justify a more expansive concept of cognition. The authors demonstrate the roles of affect and embodiment in document assessment and use, with a prolonged example in the realm of browsing pornography.

Originality/value – Models of information seeking and use need to account for diverse kinds of human-document interaction, to include documents such as music, film and comics that engage the emotions or are perceived through a broader band of sensory experience to include visual and auditory components. The authors consider how those human-document engagements form virtual communities based on the similarity of their members' affective and embodied responses, which in turn inform the arrangements, through algorithms, of the relations of documents to each other. Less instrumental forms of information seeking and use – ones that incorporate elements of embodiment and affect – are characterized as esthetic experiences, following the definition of the esthetic provided by Dewey. Ultimately the authors consider, given the ubiquity of information seeking and its rhythm in everyday life, whether we can meaningfully characterize information seeking as a distinct human process.

Keywords Information retrieval, Computers, Aesthetics, Information seeking, Affect, Desire, Pornography

Paper type Research paper

How do people seek information, particularly in information systems, whether analog, digital, personal and/or institutional? How do people evaluate documents – either the documents themselves or representational surrogates in various kinds of retrieval systems – in their consideration of what to read, view or listen, and in their subsequent use? What are the consequences in the design of information systems based on these practices?

These questions have long been at the heart of the field of information, media and literary studies. While researchers within information studies have properly identified the significance of the process of seeking information – especially documents (Savolainen, 2008; Case, 2012; Fidel, 2012), there has been a corresponding failure to consider the full range of the ways people evaluate and select documents. There has been a similar failure to consider the full variety of ways people interact with documents, which has been the strength of media and literary studies, particularly the way these interactions shape the performance and use of information retrieval (IR) systems. In particular, we find the information-seeking and use literature in information studies to be unduly concerned



with a restricted notion of cognition, to the detriment of the embodied and affective responses of people when they use documents.

The theories of Merleau-Ponty and contemporary work in cognitive studies have led to a series of propositions regarding the mind. These propositions emphasize the roles of perception, embodiment, unconsciousness, intuition and affect in mental function. Varela *et al.* (1993), Lakoff and Johnson (1999) and Damasio (2008) give good introductions. These ideas are well understood by now, and in general circulation. However, they have not been fully explored within the contexts of IR or knowledge organization specifically or in information studies generally.

The cognitive turn in information studies, initiated roughly in the mid-1970s with the work of Brookes (1975, 1980), Belkin *et al.* (1982) and Belkin (1990), marked greater insights in both studies of information seeking and in IR. That work made explicit the cognitive nature of the exchange in a wide variety of human-document and human-information system interactions. Although a diverse body of work prefigured and aligned itself with the cognitive turn, including the professional training of librarians, we can view the interest in cognition as the consequence of an interest in how humans interact with information, and as the refutation of a purely technological view of information, a position strongly associated with the work of Claude Shannon.

What then is meant by cognition? Although the cognitive turn places people as a central concern in information studies, we find that there is generally little theorizing within the field for this essential concept. The cognitive turn in information studies can perhaps be best summed up in a single statement, by Brookes (1980, p. 131), expressing the relationship between knowledge and information:

Some years ago I expressed this relationship by what I called the “fundamental equation” [of information science]:

$$K[S] + \Delta I = K[S + \Delta S]$$

which states in its very general way that the knowledge structure $K[S]$ is changed to the new modified structure $K[S + \Delta S]$ by the information ΔI , the ΔS indicating the effect of the modification.

Brookes himself spends relatively little time expanding the concepts of knowledge or cognition and instead develops the concept of information. Though no particular fault of his, the degree to which an individual's knowledge has stood in for cognition generally in the information-seeking literature is remarkable. In the absence of a theory of cognition, the field has resorted to fairly simplistic notions, with unfortunate consequences for the way we think about information, documentation and information systems. The common notion of cognition is simplistic in three ways: first, it posits a mechanistic relationship between information and cognition; second, it conflates cognition with consciousness' procedural and propositional content; and third, it focuses on the individual without consideration of the social and cultural dimensions of cognition.

Information and cognition

Brookes casts two fundamental phenomena into relationship with each other: cognition and information. Before and since the cognitive turn, we have spent significant effort trying to describe the eponymous phenomenon of “information science/studies,” a quest spent in part to help define the field itself, including its areas of research, degree programs and curricula. For a review of this work, the reader is referred to the work of Buckland (1991) and Furner (2010) (3 Information pieces).

According to the cognitive model, information is both commonly understood to be the thing that changes a cognitive state, and also as the subjective knowledge that we all carry around in our heads. The latter is the approach characterized, though not necessarily

embraced, by Buckland (1991) that “information-as-knowledge” is “personal, subjective, and conceptual” (p. 351). This perspective of information is characterized by Furner (2010) as socio-cognitive:

In conceptions [of socio-cognitivism], the emphasis is on action and process, and especially on processes by which people become informed or inform others. Information is conceived either as the act that causes a change in a person’s mental state, internal “knowledge structure,” or “image” of the world [...]. [T]he *cognitive*, user-oriented viewpoint allow that the nature of the change wrought on an individual’s mental model or image of the world by a given informative act depends at least in part on the prior state of that individual’s model. The main theme of the *sociological*, community-oriented paradigm is that individuals’ images of the world are shaped at least partly by those individuals’ understandings of others’ views; the *cultural*, discourse-oriented paradigm derives from a recognition that the world itself is socially constructed in a strong sense, that is, as a direct result of people talking about it (p. 175).

This cognitive theory of information has had a tremendously useful impact, for example, in transcending the naive assumptions of information system design and evaluation that often accompanied the early period of information science. One place to witness the consequences of this cognitive shift is in the work of relevance that was the focus of IR system evaluation since the Cranfield experiments set out to test a relatively simple proposition: “An indexing or classification system should be judged by the retrieval results it produces, namely, the extent to which it brings forth relevant material and rejects the irrelevant” (Swanson, 1965, p. 1). Relevance was originally assessed using mechanistic evaluation criteria and simply assessed whether there was a match between the document indexing and a submitted query. Over time, through the work of researchers, such as Wilson (1973), Swanson (1971, 1977) and Harter (1992), amongst many others, relevance evolved to be an evaluation of an IR system’s ability to return documents that effect change in a person. Wilson (1973, p. 458) says “psychological relevance [...] has to do with the actual uses and actual effects of information: how people do use information, how their views actually change or fail to change consequent on the receipt of information.” Harter (1992), building on the theories of Sperber and Wilson (1995), distinguishes the concept of relevance from aboutness (p. 603). Relevant information brings about a change in a person’s psychological context, that is, the person’s cognitive mental construction of the world at any given time (p. 605). Aboutness is purely a topical match between a document and the need, and does not include a notion of utility, or more precisely, an impact on the user’s mental state.

Narrow models of cognition

As useful as it is, the turn toward psychological relevance is almost nearly always described in relatively narrow cognitive terms relating conceptual, topical or propositional content. This continues to be the model in for many in the field of information science, for example, White (2011), where the cognitive effects he describes are conceptual mental constructs. Citing Wilson (2007), White says “A cognitive effect occurs when an input of newly presented information interacts with a context of existing assumptions in one of three ways: by strengthening an assumption; by contradicting and eliminating it; or by combining with it to yield a new conclusion – one derived from neither the new information alone, nor the context alone, but from the new information and the context combined.”

We can begin to see that the outlines of a tacit model of both the mind and the information-seeking process emerge from this discussion. The human in this process is characterized as a fully conscious cognitive subject whose mind consists solely as its current state of knowledge. The mind is solely what it knows, and the processes required to change that knowledge when it encounters new information. The mind is fully conscious in the sense that it is fully present, without unconsciousness, intuition or even semi-conscious activity like imagination.

The model of mind presented is the sum of its instrumental knowledge, i.e., the content of its cognition, carrying ideas and their interrelations about in a disembodied way, where even perception plays no particular role. The model of cognition is focused on individual, asocial consciousness as the information-bearing part of the mind, and the process of becoming informed is characterized as filling gaps in one's own knowledge.

The close binding of information and cognition is also present within the literature of cognitive science and artificial intelligence. "The central intuition behind cognitivism is that intelligence – human intelligence included – so resembles computation in its essential characteristics that cognition can actually be defined as computations of symbolic representations" (Varela *et al.*, 1993, p. 40). According to the many adherents of cognitivism, including Simon, Chomsky and Minsky (p. 40), cognition is defined as "information processing as symbolic computation" (p. 42). Pylyshyn (1984) used the term "informavore" – that the minds of living creatures function through the ingestion of information. Information is the grist of cognition, and where we often run afoul is our characterization of the mind solely or even just principally about the symbolic manipulation of information.

The selection, even implicit, of a theory of mind drives our subsequent understanding of our interactions with information. Once we characterize the mind primarily as a mill working on the grist of information, it makes sense that we would want to do that work efficiently, with the least amount of labor necessary. The adoption of the principle of least effort is a consequence of this narrow information-processing theory of mind. That information seeking could be fun, or esthetic, does not enter into this theory of the mind, and that is not without consequence either: many of our information systems are designed with indifference to beauty or pleasure.

Social aspects of cognition

As witnessed through the synecdoche of relevance, the cognitive turn demonstrates a re-orientation toward humans in information studies. The cognitive turn of the mid-1970s in IR research was crucial, in our opinion, to developing fuller models of information seeking of which much has been accomplished in the last two decades. Much of this research has emphasized social and cultural approaches to the study of interactions with information, and has expanded the field's implicit theory of mind. However, the social approaches have generally proceeded without a strong recognition for a more expansive theory of cognition, one that incorporates notions of affect and embodiment. Arguing for a more complete model of cognition and of the person in human-document interaction, particularly the role of affect, is not a refutation of social approaches that have taken root in the last two decades, nor does it reject the comparative and historical approaches to the study of information use or organization that have long been a part of the field. Socio-cultural approaches have, in our estimation, been significant for advancing the study of information.

Hjørland's (1997) work, for example, can be characterized as socio-cognitivist whose primary object of study is the "discourse community," that is, the milieu, epistemological or social/cultural unit whose members are bound together through a set of related information practices. The purpose of study, according to Hjørland and Albrechtsen's (1995) characterization of domain analysis, is to study the objects of the work of discourse communities, including "[k]nowledge organization, structure, cooperation patterns, language and communication forms, information systems and relevance criteria" (p. 400). Others that have advocated for the social approach include Savolainen (2008), Lloyd (2012), Talja *et al.* (1999, 2005, 2007), Talja (2002), Sundin and Johannisson (2005a, b).

Frohmann (2004a, b) identifies shortcomings in subjective approaches, including the cognitivist one we advocate here. He demonstrates difficulties in the use of cognitive approaches in the definition of information and the development of information practices. Frohmann's (2004a) project is to define information, or more precisely, to fail at defining it

using a subjective approach, urging a shift away from definitions and theories of information toward descriptions of social practices (p. 396), noting that a “document becomes *informing* only given certain kinds of documentary practices” (p. 397). Frohmann’s rejection of cognitivism as the basis for a definition of information is quite valid – particularly because the cognitivist approaches used to describe information use in our field heretofore have been quite narrow. Our simple argument is that the informing process needs to be expanded to include broader definition of cognition. Furthermore, those elements, including embodiment and affect, are just as certainly shaped by various kinds of social and cultural practice, documentary and otherwise. Frohmann’s critique is attractive because, at its heart, it is a dissatisfaction with narrow uses of information as mere input to instrumental cognitive labor.

Ultimately, the social and the individual subjective approaches do not conflict with each other. Both need an adequate model of the mind to proceed, and narrow cognitivism constrains our subsequent descriptions of information use, whether those descriptions are social or whether they focus on the individual. Social and cultural systems are made up of individuals, and even those who feel that the study of social systems is logically antecedent to individual cognitive behaviors need to make sure that individuals are adequately theorized or described. Nor does a description of a cognitive system and its elements mean that historical or cultural forces do not shape those systems. Clearly, affect – including, for example, what we like and what we do not like, the films we enjoy, the music that moves us, what we regard as beautiful – is shaped by cultural forces. Cvetkovich’s (2003) project in *An Archive of Feelings*, for example, connects sexual trauma to the development of queer identities. Affect and social systems are bound up in a myriad of ways, and are inseparable; clearly theories of affect and social systems are similarly bound together.

A broader notion of cognition

The over-reliance on a narrow conception of cognition is consistent with a confusion present in the general literature. According to Lakoff and Johnson (1999, p. 12):

Confusion sometimes arises because the term *cognitive* is often used in a very different way in certain philosophical traditions. For philosophers in these traditions, *cognitive* means *only* conceptual or propositional structure. It also includes rule-governed operations on such conceptual and propositional structures [...] Most of what we will be calling the *cognitive unconscious* is thus for many philosophers not considered *cognitive* at all.

In what follows, we will use the term cognitive in the broadest possible sense, to describe any mental operation and structure that is involved in language, meaning, belief, perception, emotion, conceptual systems and reason. This is the practice common in contemporary cognitive science. Cognition is not merely the propositional components of conscious thought, or the internal structure of a person’s knowledge, but needs to be extended to include unconscious, embodied and affective mental components. Many theorize that cognitive operations are primarily unconscious, so the term cognitive unconscious accurately describes all unconscious mental operations concerned with conceptual systems, meaning, inference and language.

Affect

Lakoff and Johnson’s project is concerned with embodiment and unconsciousness, and the use of metaphor in thought. However, we still find one shortcoming: affect is not present in his present definition of cognition. Cvetkovich (2014, p. 13) says “‘Affect’ names a conceptual problem as much as a tangible thing. As such, it is best understood as an umbrella term that includes related, and more familiar words such as ‘feeling’ and ‘emotion,’ as well as efforts to make distinctions among them.”

What is affect and why does it matter? What is the significance of incorporating affect into our models of people as users of documents? Ngai (2005, p. 27) distinguishes affect and emotion as a difference of intensity and degree, rather than a formal difference of quality and kind. According to Ngai (2005), “affects are less formed and structured than emotions, but not lacking form or structure altogether” (p. 27). Ngai provides the distinction between irritation and rage. “While one can be irritated without realizing it, or knowing exactly what one is irritated about,” writes Ngai, “there can be nothing ambiguous about one’s rage or terror, or about what one is terrified of or enraged about” (p. 27). Ngai finds affect to be less narratively structured in the sense of being less object oriented or goal oriented; it is often intentionally weak and therefore more ambiguous than, say, emotions, which, for Nussbaum (2001), are “closely connected with action” (p. 135). Yet for Freud (1900/1965), while affect does not reflect or think, affect nevertheless acts (pp. 357-359) inasmuch as affect persists in immediate adjacency to the movements of thought: moving between conscious and unconscious thought. For Freud, as for Ngai, affect and cognition are never fully separable, if for no other reason than thought is itself a body, embodied. For Seigworth and Gregg, affect is the name we give to visceral forces other than conscious knowing, beyond emotion, that are deeply relational. “Affect,” they write, “is found in those intensities that pass body to body (human, nonhuman, part-body, and otherwise), in those resonances that circulate about, between, and sometimes stick to bodies and worlds, and in the passages or variations between these intensities and resonances themselves.” For Ngai, the benefit of analyzing ambient affects is that they may be better suited to interpreting ongoing states of affairs. “What the switch from formal to modal difference enables,” writes Ngai, “is an analysis of the transitions from one pole to the other: the passages whereby affects acquire the semantic density and narrative complexity of emotions, and emotions conversely denature into affects” (p. 27).

Seigworth and Gregg (2010, p. 6) point out that the watershed moment for the recent resurgence of interest in affect came in 1995, when two essays, one by Sedgwick and Frank (“Shame in the Cybernetic Fold”), and one by Massumi (“The Autonomy of Affect”) were published. These two essays, as well as subsequent work in the footsteps of these scholars, have given substantial shape to our understanding of affect in the humanities. In their essay, Sedgwick and Frank rely on Thomkins’ (1962) psychobiology of differential affects to follow a quasi-Darwinian “innate-ist” bent toward matters of evolutionary hardwiring to understand affect as an ambient irradiation of social relations. Meanwhile, Massumi relies on Deleuze’s Spinozian notions of “immanence” to understand complex assemblages that come to comprise bodies and worlds simultaneously. These two lines of thought help us understand the two dominant approaches to affect studies today. Whereas for Sedgwick and Frank via Thomkins, affect is understood as a prime “interest” motivator that helps us understand bodily drives, for Massumi via Deleuze, affect is an entire, vital and modulating field of myriad becomings across human and nonhuman. Seigworth and Gregg (2010, pp. 6-9) outline the ways in which these two lines of thought have given rise, tentatively, to several new approaches to affect studies in a variety of fields, including psychology and psychoanalysis, technology studies, cultural studies, philosophy, linguistics and elsewhere, listing, tentatively, eight recent approaches to affect that sometimes overlap.

Embodiment

The neglect to examine embodied responses to information may reflect an assumption among some information scholars (like Belkin *et al.*, 1982; Belkin, 1990) that the experience of information is fundamentally cognitive. Yet the perception of information cannot be reduced to a question of knowledge, just as sensation cannot be equated with “the reflective consciousness of sensation,” as Shaviro points out. Shaviro (1993, pp. 26-27) writes:

The Hegelian and structuralist equation suppresses the body. It ignores or abstracts away from the primordial forms of raw sensation: affect, excitation, stimulation, and repression, pleasure and pain,

shock and habit. It posits instead disincarnate eye and ear whose data are immediately objectified in the form of self-conscious awareness or positive knowledge.

Instead, the perception of information makes meaning before it makes conscious, reflective thought. Belkin's description of the process of sense-making does not acknowledge that sense-making owes as much to a carnal existence as it does to conscious thought. Yet one should not make the mistake of thinking that carnality and consciousness are equally valued in every sense-making situation; they are not fully disclosed to each other, and at times one might preoccupy us more than the other. Sense-making is neither purely conscious nor corporal; rather, it is mediated through both consciousness and corporality and, therefore, always indirect and incomplete.

Cognitive-based models of information have not taken bodily being in document assessment very seriously. Yet information is sometimes meaningful to people precisely because of their bodies. Sobchack (2004, p. 60) explains it succinctly:

As "lived bodies" (to use a phenomenological term that insists on "the" objective body as always also lived subjectively as "my" body, diacritically invested and active in making sense and meaning in and of the world), our vision is always already "fleshed out." Even at the movies our vision and hearing are informed and given meaning by our other modes of sensory access to the world: our capacity not only to see and to hear but also to touch, to smell, to taste, and always to proprioceptively feel our weight, dimension, gravity, and movement in the world.

Thus, the body is not only immersed in making meaning but also physical sense. Information can provoke the "carnal thoughts that ground and inform conscious analysis" (Sobchack, 2004, p. 60). This existential understanding of embodiment suggests that one does not have a body but, instead, that one is a body, and that one makes meaning and relates to the world and others as a body.

Sobchack's emphasis on our bodies' engagement and transformation by and in the world reveals the ways in which embodied experience is always already shaped by the context of history and culture. Indeed, embodiment does not take place apart from an historical and cultural existence. Nor can an embodied experience be reduced to fixed essences; instead, embodied experiences are always open to other interpretations. Whether describing the way technology contorts and habituates bodies or the way sexual arousal and other affects overflow the process of seeking, we are concerned with what Sobchack refers to as the "lived body." This concern, according to Sobchack (2004), is "not merely with the body as an abstracted object belonging always to someone else but also with what it means to be 'embodied' and to live our animated and metamorphic existences as the concrete, extroverted, and spirited subjects we all objectively are" (p. 1). The goal of an analysis of our embodied experience, therefore, is to differ from treating the process of information seeking as object oriented and from treating our bodies in that process as more than mere objects.

Like Merleau-Ponty and Sobchack, our emphasis on the "animation of the human body" appreciates how our lived bodies enable us to sense and respond to the world and others. This emphasis is different from the way in which the body has been previously explored by a variety of scholars. Although the body has been a major focal point for many scholars, it has often been regarded primarily as an object of study, as either a text or a machine. We are particularly struck by the way some feminist scholars attempt to redeem the body in an objectifying, image-saturated culture "without much sense of bodiliness in their analyses," according to Csordas. Such an analysis (Csordas, 1994, p. 4):

[...] carries the dual dangers of dissipating the force of using the body as a methodological starting point, and of objectifying bodies as things devoid of intentionality and intersubjectivity. It thus misses the opportunity to add sentience and sensibility to our notions of self and person, and to assert an added dimension of materiality to our notions of culture and history [...]. [Scholars tend to

study] the body and its transformations while taking embodiment for granted [...]. This distinction between the body as either an empirical thing or analytic theme, and embodiment as the existential ground of culture and self is critical.

Thus, an analysis of embodiment must be an analysis of “what it is to live one’s body, not merely look at bodies” (Sobchack, 2004, p. 2).

A focus on the “lived body” necessarily requires a subjective analysis of a lived experience. The purpose of analyzing a subjective (and sometimes personal) experience of searching online is not to universalize a particular experience. Neither should one, according to Braidotti (2002, p. 7):

[...] confuse [the] process of subjectivity with individualism or particularity; subjectivity is a socially mediated process. Consequently, the emergence of new social subjects is always a collective enterprise, “external” to the self while it also mobilizes the self’s in-depth structure.

An analysis of the subjective experience as part of an existential phenomenological method is intended to open up (rather than close down) our understanding of more general entailments of the seeking process and to suggest an intimate and material relationship we have with that process. A turn toward the personal anecdote in analyzing the process of seeking information is not merely a self-indulgent analysis of describing experiences for the sake of indulgence. Its aim is to describe and explicate the general and possible structures that inform the process of seeking and make it potentially resonant for others. Sobchack (2004, p. 5) puts it best in the following passage:

[...] although in historical and cultural existence particular experiences may be lived idiosyncratically, they are also, and in most cases, lived both generally and conventionally – in the first instance, according to general conditions of embodied existence such as temporality, spatiality, intentionality, reflection, and reflexivity and, in the second instance, according to usually transparent and dominant cultural habits that are not so much determining as they are regulative.

Thus, the value of subjective analyses as evidence for understanding embodiment is not necessarily reflective of whether one have actually had the experience (indeed, that is besides the point); it is about whether or not “the description is resonant and the experience’s structure sufficiently comprehensible to a reader who might ‘possibly’ inhabit it (even if in a differently inflected or valued way)” (p. 5). The turn toward anecdotal logic (Gallop, 2002) serves as an antidote to objective, positivist and quantified accounts of information, and the process of seeking more broadly that do not describe our living in that process. Because our conceptual systems and our reason arise from our bodies, we will also use the term cognitive for aspects of our sensorimotor system that contribute to our mental functioning.

Narrow, medium and broad channels of cognition

Ultimately we think of cognition like a river with three regions. In the middle, at the surface, there is a narrow channel of swiftest water, surrounded by a middle band of slower moving water. And the third channel of slowest water running along the shore and river bottom is the largest by volume. Of the total cognitive system, conscious prepositional thought is only that narrow visible band, existing and embedded in a larger context of affect, all of which takes place in a larger system of perception. We are positioned to observe directly only the middle channel, and only the surface and infer the rest, even though that middle channel only represents a portion of the total river. We engage the world, including the informational and documentary universes, through all three channels, and yet we have heretofore characterized the interactions primarily with a concern with only the smallest – albeit the most visible – component.

What kind of person is this, one reflected in the broader definition of cognition, whose cognition is embodied, placed within a system of perception, and attuned to affect? This is a

person for whom affect is a significant component of response in the process document selection and use. One who makes decisions on quasi-conscious and conscious criteria, guided by intuition, motivated by feeling and emotion, whose interaction with documents is via his or her body? Why have not we seen more of this person in our research? It is almost certainly the case that we have unnecessarily narrowed our field of vision to investigations of information seekers and users engaged in highly constrained settings: students and professors, lawyers and others in professional business settings, no doubt engaged in imposed tasks, often in the most dreary of environments. As Ross (1999) states “The emphasis on goal-directed, problem-solving information is reinforced when the researcher frames the data collection by asking interviewees or respondents to think first of a specific incident in which they had a problem and took steps to resolve it or had an uncertainty and tried to clarify it.”

It is as if, in trying to define information, we found it in the human mind, but only discovered that part of the mind working with concepts in a procedural, logical way. It follows from the way we have long characterized documents, by discipline and topic. The other parts of the mind were left undiscovered, or at least generally unaccounted within the theories of information science. And, once we had our tacit, restricted notion of information and its relation to a restricted notion of the mind, we went and looked for examples of their interactions in a set of restricted settings.

Our argument for an expanded notion of cognition does not mean that we believe that affect has not been studied at all; it is merely to say that it has been a relatively understudied phenomenon within the field of information studies. The current affective turn in the humanities, for example, is in the work of Cvetkovich (2003) and Muñoz (1996). It also appears, in other manners of treatment, for example, as an issue in the construction of archival collections and affective communities, or the connection between affect and human rights archives in Caswell and Gilliland (2015). And it appears as a concept in related fields, such as computer science and human-computer interaction, for example, where it is described as “felt experience” in McCarthy and Wright (2004); the related concept of embodiment is described in Dourish (2001) and Leug (2015).

Certainly, we do not want to diminish the informational value of documents, the effort required to locate and use documents related to a topical information need or the times we engage with information systems by necessity of becoming informed. Consulting a book or a website for a newly discovered health condition is not typically considered “fun.” Day (2014) describes the historical shift from “persons and texts into users and information” that marked the development of information science. We would like to return us to the broader notion, associated with librarianship and with documentation, of a broader range of engagements amongst people and media, and to reflect the full range of those engagements in our models of both. It is simply the case that we think most people, in most cases, enjoy reading, watching films, listening to music and all other variety of use of different kinds of media, and they predominate compared to those who are in compulsory or gap-filling modes of information seeking. Counterexamples notwithstanding, people generally like going to bookstores, using Spotify or Pandora to discover new music, choosing a video game, watching videos on Youtube, reading on Wikipedia or the web, selecting a movie to watch on TV or on Netflix – a whole variety of “information” and “system” use. And unfortunately in the realm of libraries, we have built systems that reflect our disinterest in the emotional lives of our users.

This enlarged definition of cognition provides us with a clearer picture of understanding people in their interactions with information and information systems. It should be clear that we believe that examinations of relevance and use – as the key relationships between people and documents – have heretofore relied on an overly strict sense of cognition, to the exclusion of the role of affect and embodiment. And our restricted notion has also restricted us in the kinds of documentary use we investigate,

and the settings where that seeking and use takes place. If we broaden our investigations to include people in more routine everyday settings, no doubt we will find people who consult documents not for what they can specifically learn, or for solutions to particular problems or needs, but people, like in Hartel's (2011) investigation of hobbyists and Ross' (1999) investigation of people who read for pleasure. These are subjects who are engaged in things they enjoy, whether that is a life activity, such as Hartel's gourmands, where interacting with documents in an ineluctable part of the process of their cooking, or those who view documents for pleasure, such as in Ross. These are people who engage with documents, not because those documents inform but because they entertain. We do not necessarily want to be too rigorous in separating these two separate notions of information use, but only want to point out how badly affect has been neglected by researchers in our field.

We have two ways of countering the restricted notion of cognition. First is to appeal to theories of mind, Merleau-Ponty amongst others, that utilize an expanded notion of cognition to include affect and embodiment. A second approach is via personal reflection: did you like the last movie you saw? Do you have a favorite piece of music? Aside from what you learned from the last book you read, did you enjoy it? Affect is an important element of cognition because it provides incentive (and, invariable, disincentive) to guide action in the world: you go to movies that you expect to enjoy, you dread obligatory activities that you expect you would not enjoy. Even boredom is an affective response. We doubt we have enough evidence here to assert that emotion is an a priori of the human mind, like time and space; it may be possible to examine life from a purely functional and affectless space. But our experience leads us to believe that this is unlikely; life presents a series of episodes that provoke or present a range of affective responses that also range in intensity. The affectless moment is relatively rare.

Ultimately we have two models. One of narrow cognition that characterizes the mind as an instrumental and functional processor of information. The second model presented is a mind, dominated by unconscious operation particularly in its embodied acts of perception, and guided by affect which motivates and gives energy to our behavior. In the second theory, the mind engages with information through a full cognitive spectrum, including, as the first model explains, encountering ideas that change our states of knowledge. However, the second model also permits information to engage our esthetic, imaginative and emotional beings. Our primary purpose here is not to evaluate the validity of one model vs the other through an assessment of the scientific evidence, but rather to evaluate how the (sometimes implicit) selection of one model over another shapes our subsequent development of models of information seeking and use.

Document assessment

We began our critique of affectless models of cognition with a review of the contribution of a cognitivist position on relevance. As we begin to illustrate, the concept of relevance expanded over time from a narrow concept used in IR system evaluation to a concept used to understand how people judge information, sometimes expressed as part of the document selection or information-seeking process. Here, we get some inkling of affect as an aspect of the information-using subject. Among other things, an overly restrictive notion of cognition – one that omits affect – means that we have not understood the role of emotion in the document-selection process. As noted above, we have seen traces of the concept in previous research on relevance, but our restricted notion has generally blinded us to the presence of affect. Within librarianship and information studies we have long characterized documents regarding their informational value, for example, by what they have to say about a range of particular topics. Users are characterized as learning on a topic, and their motivations are often described as needs or problems, or as gaps in their knowledge.

Kuhlthau (1991) found that her research went “beyond the cognitive aspects of information seeking to examine the feelings users commonly experience. As one participant noted, ‘Uncertainty is in the head, but anxiety is in the pit of the stomach.’ The whole experience of users affects their information use, their feelings as well as their intellect, particularly in the exploration stage. By neglecting to address affective aspects, information specialists are overlooking one of the main elements driving information use” (p. 370).

Barry and Schamber (1998) demonstrated that users select documents for “affectiveness” and “entertainment value” although the choice of setting and tasks may have diminished their significance in their research. Hirsh (1999) reported that teenagers in her study selected topics and materials because they were “interesting.” Imagining teenagers, that comment is less likely to indicate that newly presented information is interacting with a context of existing assumptions to yield new understanding, but more likely that the topic was pleasurable for its ability to entertain.

It is interesting to note that perhaps Hirsh and Kuhlthau located affect in the use of information because they investigated children, who were perhaps less shaped by convention and professional culture – including the professional culture of the social scientific research project – where emotional response is frequently omitted.

Use: the case of pornography

Any single-word search on Xtube, an online video host for porn, inevitably produces a set of images tagged with an array of sequenced descriptors. For instance, an inquiry for all items designated as “bear” returns images and videos also labeled as twink, bareback, trucker, beefy, daddy, hairy, piercings and mature. Following the sequence to “twink” materials introduces blond, vintage, love, kissing, 18, breed, smooth, bubble, perfect, chub, Latino, strip, amor, college and interracial. A new search for “domination” returns materials tagged as Asian, Thai, Japanese, worship, control, humiliation, black, pussy, skinny, whip, BDSM and transsexual. The relationship between some of these tags probably seems, if not natural, at least familiar – in porn terminology hairy is a characteristic feature of bear. Other tags, however, create unexpected associations and wondrous juxtapositions – bear would often exclude twink, smooth bubble conjures the fluid permutations of a lava lamp, while the national identity Japanese precedes worship without the adjectival modification common to a syntactical relationship. While these unusual indexes may look disorderly, in fact, they evidence the process by which viewers and algorithms interact to arrange digital materials housed in archives of amateur pornography. These arrangements, according to Keilty (2017), take shape according to patterns of browsing that enact carnal desires. The carnal aspects of browsing pornography refract both affect and embodiment as sexual desire (or disgust), creating a conjoined relation between subject and object via embodied engagements with the documents and information systems that organize and represent them.

If the use of pornography is an example of the prevalence of affective and embodied documentary use, then we should note its prevalence, and its relatively silent role in the center of western culture. Pornography, as well as other forms of affective documentary use, constitute much more than a special or unusual case in information or media use, and are emblematic of everyday documentary practices. A study by Spink *et al.* (2004) finds that “searching” for sexual images on the internet accounts for more time and effort on the part of users than any other type of search. Yet much of the research within information studies around online pornography discusses these subjective encounters using quantitative and behaviorist modes of description, rendering the experience of browsing pornography as purely cognitive, with affectless effect. In information studies, the experience of browsing pornography online has been described as “seeking sexual information,” an example of the way in which some scholars have attempted (somewhat defensively) to put the sensuous,

embodied and ambiguous realm of online pornography into our dominant cognitive paradigm, using detached but still ambiguous terms (Spink *et al.*, 2004). Despite that sexual arousal is a central experience to browsing online pornography, it has gone unexamined in much of the research on the subject. Perhaps carnal responses to pornography have been considered too crude to invite much investigation. Or perhaps studying the sensuous and affective dimensions of "seeking sexual information" is dismissed as imprecise criticism in favor of more "rigorous" and "objective" (usually quantitative) modes of description.

For Keilty (2016), the neglect to examine affective responses in pornography – particularly carnality – reflects the common assumption among scholars that browsing online is fundamentally cognitive and that, therefore, browsing pornography is analogous to searching for plane tickets. That analogy is misleading, however, because in the latter case pleasure derives from finding a precise object, usually the least expensive and most convenient tickets, using the least amount of effort. Viewers of online pornography, on the other hand, do not wish exemption from sensual being during the process of browsing. The pornographic experience is meaningful to viewers precisely because of their own bodies. Patterson (2004) showed that the pleasure of browsing pornography online does not derive from locating an imaginary perfect image that will satisfy one's desire. Instead, pleasure derives from the process of browsing itself. "To imagine the goal," writes Patterson (p. 109), "is to project into a moment of perfect satisfaction – and the obtaining of a perfect image, one completely adequate to the subject's desire." Yet nothing can compare to an imagined perfect image, leaving every image inadequate, and so the search continues. Browsing pornography, thus, adheres to something like a "principle of significant effort," one that has an illusive object orientation. Perhaps this describes the difference between "seeking" and "browsing." Whereas "seeking" suggests a specific object-oriented action, "browsing" suggests an action in which the object orientation is less defined and more open to serendipitous discovery.

Sensing sensuality

Our embodied experience of seeking pornography online is an experience of seeing, hearing, touching and moving in which our sense of the literal and the figural vacillate, sometimes discontinuously, but usually configuring to make sense and meaning together. This is because, according to Sobchack, "we are incorporated *systemically* as embodied and conscious subjects who both 'have' and 'make' sense *simultaneously*" (her own emphasis, p. 75). To have and to make sense is an undifferentiated experience that grounds and conjoins body and language, feeling and knowledge. Lingis, too, has emphasized the conjunction of the lived body and representation: "My body as the inner sphere where representations are perceptible [...] and my body as an image seen by rebound from the world, are inscribed the one in [the] other [...]. The density of the body is that of 'pre-things,' not yet differentiated into reality and illusion [...]. [The] body is a precinct of signifiers" (p. 162). For Lingis, then, the literal and the figural inform each other even as they inform us. We are both embodied and conscious in that we both have and make sense.

The process of seeking pornography online especially highlights and privileges the conjoined relation between the lived body and representation because it uses lived modes of perceptual and sensory experience to represent bodies that are also participating in lived modes of perception. Granted, porn viewers cannot fully caress the smooth shoulders of the man on the computer screen; the smell and warmth of the body on screen remain vague. Nevertheless, viewers have a partially fulfilled sensory experience of these things that make them both conscious and meaningful. This experience, according to Keilty (2012), is not reducible only to one's senses or only to cognitive reflection.

If the affective and embodied experience is an important component of documentary use, it does not necessarily follow that those interactions are the same as their nondocumentary analogs. The structure of this fulfillment is quite different in several ways from a context in

which the man is literally present. One's lived body sits in readiness in front of the screen as both a sensual and sense-making potentiality. Focused on the screen, the viewer's postural schema takes its shape based on an inclination toward (or a repulsion from) what he/she sees and hears. "If I am engaged by what I see," writes Sobchack, "my intentionality streams toward the world onscreen, marking itself not merely in my conscious attention but always also in my bodily tension" (p. 76). This tension reveals itself sometimes subtly, sometimes blatantly, but always includes an engagement of the body, and one's material being: the body contorts, retracts, straightens, reclines, leans in, gravitates, recoils and so on. While online browsing cannot fulfill certain sensory experiences (touch, smell, taste), when physically aroused, Sobchack writes, the "body's intentional trajectory, seeking a sensible object to fulfill this sensual solicitation, will *reverse its direction* to locate its partially frustrated sensual grasp on something more literally accessible. That more literally accessible sensual object is *my own subjectively felt lived body*" (her own emphasis, p. 77).

Although Sobchack is discussing her experience watching a film, this description of embodied experience maps onto the embodied experience of browsing pornography online. Indeed, we cannot assume that the electronic presence of pornography completely breaks from the procedures of general cinema and photography. Digital representation participates in a broad network of communication that includes the cinematic and photographic. In an electronic cinematic presence, one is "in rebound" (recalling Lingis) from the screen, turning reflexively (un-reflectively) "toward my own carnal, sensual, and sensible being to touch myself touching, smell myself smelling, taste myself tasting, and, in sum, sense my own sensuality" (p. 77).

Merleau-Ponty (1964, p. 166) described this phenomenon as our lived body's capacity to sense itself:

There is a relation of my body to itself which makes it the vinculum of the self and things. When my right hand touches my left, I am aware of it as a "physical thing." But at the same moment, if I wish, an extraordinary event takes place: here is my left hand as well starting to perceive my right [...]. Thus I touch myself touching; my body accomplishes "a sort of reflection." In it, through it, there is not just the unidirectional relationship of the one who perceives to what he perceives. The relationship is reversed, the touched hand becomes the touching hand, and I am obliged to say that the sense of touch is here diffused into the body – that body is a "perceiving thing," a "subject-object" (his own emphasis).

This description of the lived body's capacity to sense itself, when considered in the context of browsing pornography online, coupled with Lingis's description of sensing one's own sensuality, sounds remarkably similar to masturbation. Effectively a form of "self-touching," it can also be described as "autoerotic," "spontaneous eroticism" or "self-eroticism." Viewers, thus, take pleasure from both seeing and feeling in the process of browsing pornography online. The touching in pornography (the smooch of a kiss, the touch of a shoulder) becomes actualized as the touch of one's self. The pleasure represented by the image is physically felt by the viewer as he/she touches himself/herself.

This form of self-touching is consciously other-directed, and as such, some might argue, it maintains the subject/object distinction because it is different from forms of self-touching in which one's body and one's consciousness is self-directed. Narcissism aside, however, one's consciousness is never entirely self-directed and it would seem that masturbation demands special focus on an external, if also imaginary, figure of desire. It is precisely because one's consciousness is not directed toward one's own body but toward the figure of desire onscreen that the subject/object distinction remains interlaced rather than distinct. The diffusion of consciousness is matched by a dispersion of embodiment. The viewer is "caught up without a thought (because [my] thoughts are 'elsewhere') in this vascillating and reversible structure that *both* differentiates *and* connects the sense of my literal body to the sense of the figurative bodies and objects I see on the screen" (p. 77).

To the extent that viewers are provoked by figural objects that are elsewhere, we are not focused on the particularities of our literal bodies either. One's perception of the figure on screen and my sense of self are, therefore, vague and diffuse, even as the interaction heightens and intensifies my sensorium. At the moment, one's lived body, in rebound, senses itself in the online pornographic experience, the particular objects that sensually provoke the viewer are perceived in vague and diffuse ways. One's body is the site where the sensual event of representation occurs, where the sexual solicitation by the figure onscreen and our own self-touching become diffused into our bodies. Thus, the literal body and the figural bodies onscreen are both differentiated and connected.

Furthermore, a form of autoeroticism in which one's body and one's consciousness are self-directed requires such cognitive reflection and attention toward oneself – what Sobchack calls a kind of double reflexivity – that it can and often does undo carnal pleasure. Sobchack points out how it is nearly impossible to tickle oneself for self-consciousness of our laughing results in it becoming forced. The process of browsing pornography online collapses the distinction between object and subject insofar as browsing for sexual representation participates in perceptual “rebound.” At that moment, the search reflects sexual desire itself as necessarily other-directed and requires an object other than oneself “so as to avoid a reflexivity that is so doubled as to cause conscious reflection on sexual desire itself” (p. 78). One might even claim, then, that seeking sexual objects online fails to be pleasurable at the moment it becomes consciously reflective.

In these moments, one does not think about one's own body and one is not, therefore, thrust outside of the onscreen image. Instead, viewers are consumed by the image; they feel their bodies as only one side of “an irreducible and dynamic relational structure of reversibility and reciprocity” that has as its other side the figural body onscreen (p. 79). It is a process of reflexive and reflective exchange that allows viewers literally to feel the warmth, moisture and smoothness of a body.

This relation can be broken, not only by conscious reflectivity but also by reflexive feelings of shame, disgust or the panic of being discovered by someone outside the scene intruding upon the moment (entering the picture, if you will). The intensity of these feelings attest to the body's relation to the figure on the screen, its sense of investment in what it sees, hears, tastes, touches and smells. Consider, for example, when we cover our eyes or ears in a slasher film, literally sickened at the sight of blood, terrified by the psychopathic murderer, and frightened, frustrated or anxious by the victim's impending doom. These all attest to the conjoined relationship between the figural body onscreen and our literal body in the movie theater – an affective experience that is carnally and consciously meaningful. Similarly, browsing pornography has a carnal and conscious relation to pornographic images, conjoined by the always reflexive and reflective exchange of sensation that defines the autoerotic goals of this particular browsing process.

Sensual structure

Having recognized the role of affect, how does affective response serve as data for the continuous algorithmic process of organizing sexual representations? Sexual desire and carnal activity informs the arrangement, through algorithms, of online pornographic images in relation to each other. Such an arrangement effectively represents an index or diagram of the social network in which various pornographic images appear online. In this way, the body participates in creating a virtual community of masturbators and an alternative universe of sexual sociability.

Pornographic images online are arranged around affective and social experiences, whereby curiosity, frustration, disgust, surprise, desire, pleasure and wonder arise from the relation of images to their location within a digital space (Keilty, 2017). The representation of particular acts, body parts and fetishes can be as striking as an image's proximity to

similar or different images. By rolling the onscreen cursor over thumbnail images, for example, one causes a scrolling visual field of objects to pass the screen, which unfolds metadata surrounding an individual image or set of images, such as textual fragments and audio files about the image. As the process repeats itself from image to image, what the viewer sees is not only metadata about images, but also metadata about relations among images. On a superficial level, such relations reveal the associative principles of indexing and classification, in which images always exist in relation to other images. To offer a familiar example, such indexing occurs on Amazon.com when algorithms arrange objects based on other viewers' interests ("customers who bought this item also bought [...]"), creating a relationship according to predetermined data sets organized for the online display.

For pornography websites, however, these relations also operate on a level of sensation in that their tendencies and currents are particular to viewer-initiated spatialization. That is, viewers initiate these relations through the process of browsing for images to "satisfy" their sexual desire. The images they choose are recorded into an algorithm that then participates in producing the visual (as well as textual) association of images (proximate display) for future browsing. The resulting arrangement of pornographic images on display, effectively an index and catalog of images, is made increasingly affective by calling up anecdotal and historical information about an image's everyday use through its proximity to images or metadata of other fetishes, revealing its place in a larger social network of sexual fetishistic relations. In other words, the algorithm participates in creating a kind of sexual network among viewers.

Xtube, for example, arranges images from the moment it first engages viewers on its splash page by asking viewers to select their identity as a man or woman and to select their corresponding interest in men or women or both (the default selection is for men interested in women). Upon identifying one's gender and corresponding gender(s) of sexual interest, Xtube displays columns and rows of the most recently uploaded videos, similar to YouTube. Viewers are able to browse through a wide variety of pathways: most viewed, best rated, recently featured (by Xtube's staff), most discussed, top length, top favorites and random. Within these standard categories, Xtube arranges videos according to the latest uploaded video by default, though one can filter their search results.

At the top of the screen, Xtube offers viewers a wide selection of categories of images and videos, which correspond to viewer's previously identified sexual interests. For example, if a viewer identifies as a man interested in women or a woman interested in men, categories include anal, anime, Asian, BDSM, fetish, ebony, Latina, mature, miscellaneous, toys, group sex, interracial, lesbian, MILF and voyeur. If a viewer identifies as a man interested in men, categories include many of the same categories above with some variation, such as bear, fisting, hunks, muscle guys, transsexual, yaoi, big cock, daddies, general gay and twinks. Curiously, Xtube uses the same categories for viewers who identify as women interested in women as those categories used for viewers who identify as men interested in men, even when the categories seem inappropriate.

The viewer adds titles, descriptive information (often in the form of tags), commentary and narrative description about images. Viewers can rate images, add images to a collection of favorites, create playlists, browse other videos uploaded by specific viewers or browse a specific viewer's collection of favorite images and videos. Having incorporated social networking design elements into their websites, pornographic video hosting services make explicit the way browsing pornography has become a social experience. Viewers can befriend each other online, exchange stories about their fantasies and desires, follow each other's uploaded videos or favorite videos and contribute to wikis that attempt to explain the sexual nomenclature used in tagging pornographic videos and provide synonymous search terms, effectively a sexual thesaurus.

The sexual categorization that surrounds pornographic images ostensibly allows viewers, according to Patterson, to “project their virtual selves into a seemingly endless variety of scenarios and environments, and to embody an infinite variety of freely chosen subject positions, roles and desires” (p. 106). This nomenclature, which reflects already present social relations, functions to guide, if not overtly discipline, viewers’ subject positions and desires by creating an environment in which subjects and desires are produced as essential standards. According to Patterson, “part of the captivation of cyberporn is that it allows images to be managed and categorized so readily, allowing the subject to assimilate and emulate a particular subject position while retaining the hallucinatory promise of fluidity” (p. 107). Many of these categories reflect the nomenclature of subjects and desires within sexual subcultures. Hence, according to Keilty (2012), the bounds of power are not always top-down. Instead, these stabilized categories of subject and desire operate in complicated ways within the dominant culture. For Chauncey (1990, p. 300), such categories are created under the weight of social disapprobation, leading members of a sexual subculture to insist on a form of solidarity that requires conformity to group standards.

The search and browsing interfaces of online pornographic services also require discernible categories and classification in order to make IR effective. Images are available to viewers through the negotiation of an elaborate schema in which categories of sexual desire are produced through the sequencing of fixed subject positions always defined in relation to each other. While the viewer might role-play within these classifications, the exploration is constrained by a logic of recognizable cues. In pornographic video hosting services, viewers who submit material to the website organize their images, videos or narratives among standardized categories. Some of these sites offer tagging options, a form of folksanomic classification, but the tags are subsumed under the standardized classificatory scheme. That is, tagging, in some instances, operates within overarching categories.

The internet allows online pornographic services, then, for a global community of users who have in common similar fetishistic desires and whose affective and social relations become effectively cataloged, indexed and organized through the very structure of online pornographic images. Laqueur (2003) suggested that these online communities of masturbators constitute a change in the history of masturbation. “There are hundreds of thousands of pornographic sites that cater to every masturbatory fantasy imaginable,” writes Laqueur (p. 419), “but what is really new is the proliferation of virtual communities of onanists, an alternative universe of sociability that is created through the public revelation of the not-so-vice.” Masturbation – once a solitary sexual pleasure, marked by privacy, loneliness, self-absorption, guilt and shame – has come to be an increasingly public, social and communal experience online. Viewers enter into a participatory relationship with online pornography, contributing to how pornographic images will be arranged and displayed in relation to other images in future browsing scenarios. In other words, browsing habits supply affective and social data about the images viewers see. The algorithm arranges images around affective and social experiences around shared and algorithmically negotiated meanings of arousal and desire, which means that the arrangement is both the result of affective and social experiences and that affective and social experiences arise from these arrangements.

Merleau-Ponty’s description of physical self-consciousness reinforces the way in which viewers experience the algorithmic arrangement of images as affective and social. As touching in pornography becomes actualized as the touch of one’s self, one become conscious of his or her desire. The actualization and the consciousness are both embodied. The proximate display of images produced by an algorithm reveals one’s desire in a broader sexual and social network of fetishistic relations. This display of associated images provokes viewers to act on their self-conscious desire by clicking through to an associated desire. Viewers are, therefore, not simply lost in their desire, a purely sensual experience, but prompted to become conscious of the relation of their desire to other images.

It is important to remember, too, that the arrangement of images on display in online pornography does not reveal an image's fixed identity in relation to other images. Pornographic images online do not constitute the static presentation of a thing. Instead, these images and the process of their arrangement are lively events in which viewers participate as bodies and so make the images they see meaningful at the level of the body. Both the meaning and the arrangement of images on display constitute a probabilistic materiality in which images are not an entity but a provocation to interpretation, which thereby offers an indeterminate possibility for their arrangement through the algorithm.

This is to say, to the extent that the meaning of images changes, so too will the browsing activity around that image. Two otherwise unassociated fetishes become associated through an algorithm when viewers' browsing activity repeatedly associates the two. Should viewers interested in images categorized as "bear" also frequent images categorized as "leather," the two categories of images will be arranged online in close association with each other. The same is, of course, true of individual images. Should the meaning viewers create from these images change, so too will their browsing patterns and the association, e.g. arrangement, of different images. Thus, these images do not express a set of things in relation to each other whose identities are self-evident or whose arrangements are fixed. They are always associative identities, and probabilistic in nature.

Outside the context of pornography, information scholars have long acknowledged the extent to which the arrangement of objects reflects a broader social and cultural network. Notably, Briet in her treatise *Qu'est-ce que la documentation?* discusses the ways in which information systems ("documentary systems," in her language), such as the catalog and index, not only point to the object but also reflect the social networks in which the object appears (Day, 2006, p. 49). Catalogs and indexes, whether visual or textual, are always a culturally embedded and socially networked phenomenon. Moreover, the technologies as well as the techniques for accessing pornography, following Briet, are themselves expressions of culture. Day puts it succinctly: "Information and communication technologies may introduce a 'new rhythm' to society and culture, but they themselves are a symptom of [...] social development" (p. 55). Thus, the arrangement of images displayed online is fundamentally cultural and social.

The embodied aspects of the arrangement of objects have not been lost on visual criticism. Scholars of enlightenment visual culture, for example, reveal a corporeal relation between exhibition and viewer in the arrangement of objects on display in the Baroque curiosity cabinet, the *Wunderkammer*. In such cabinets, the arrangement of objects on display also arose out of wonder, surprise, irritation and curiosity. This is not to say that the arrangement of images online today can be anchored solely in the referents of the early modern period, or that there is some kind of causal effect of old media on new. Instead, the digital functions as part of a baroque genealogy, which articulated differential relations between embodiment and technics. It places, according to Munster, "body and machine, sensation and concept, nature and artifice in ongoing relations of discordance and concordance with each other." The relationship between digital visual culture and Baroque visual culture has been articulated by numerous new media scholars (Murray, 2008; Munster, 2006).

As with the *Wunderkammer*, many pornography websites provide an overflow of images and textual fragments, seemingly arranged in a rambling and chaotic fashion, opposed to concepts of ordering and system. Recall the myriad of pornographic images on display alongside pop-ups, advertisements, flash and animated GIFs, all accompanied by background music. Many pornography websites provide an enormous range of selection that seems to promise satisfaction to the viewer. This conception of design participates in an aegis of "getting what you want" but in excess of it. In this way, pornography websites promise the accessible and visible while delivering the curious, obscene and obscure.

Such a method of display is an esthetic contrivance that draws the wonder, curiosity, surprise and, sometimes, frustration of the viewer, amassed, no doubt, by the material limits of computer technologies, such as the capacity of silicon to conduct electrons at particular speeds.

Understanding the role of pleasurable browsing in the arrangements of online pornographic images allows one to map the contours of new forms of sexual associations in an electronic age. In this way, the internet does not merely act as a repository for objects – no archive ever does. Instead, these objects are relational and dynamic, and their arrangement is socially and culturally embedded. The internet is, therefore, never merely used, never merely instrumental. It is itself a site of social relations that has been incorporated into our lives, its uses primarily affective, and transforms us as embodied subjects.

The esthetic experience

The linking of perception, affect and judgment in a phenomenology of information seeking connects the activity with theories of esthetic modes of experience. These are not just elements that distinguish a broad model of cognition from a narrow one, but also contribute to an understanding of information seeking as an esthetic experience as distinguished from a narrow instrumentalist one. A concern for esthetics in information seeking not only centers perception and affect within the activity, but also provides us with a model for transcending models of narrow purpose for information systems. An information-seeking theory of esthetics posits that engagements with information and information systems – like other engagements with esthetic objects, including particularly artistic objects – can be pleasurable, and that information systems themselves can be designed not only for utility but also for beauty and engagement.

Esthetic modes of perception and experience can best be understood in the context of instrumentalist theories of mind that came to the fore following Darwin. In this view, predominant today, the human intellect is the product of nature and evolutionary processes. The intellect is directed to survival, and an organism adapts and improves its survivability by learning and recognizing useful objects in the environment, and which objects are dangerous and should be avoided. For the instrumental mind, the world is organized purely around the principle of which items can help it survive, and which pose danger. Instrumental understanding of the world is ego-centric: how does this help or hinder me? The majority of things that are neutral – provide neither help nor danger – are simply not of a concern, and are unperceived. Objects are not understood in their own nature, but purely in relation to their utility to the organism.

Schopenhauer predated Darwin, but also anticipated many key concepts of early twentieth century philosophy, including the idea that nature guided the development of human intellect. For him, the will was a metaphysical master concept, manifested in both as our physical being and our will to survive. The individual's will strives to acquire the goods and knowledge needed for survival and security, which is never completely obtained. As soon as the organism satiates its hunger or thirst, the cycle is renewed, and satisfaction is never complete. We are goaded by our insecurities and our lack of knowledge:

“All *willing* originates from need, thus from lack, thus from suffering. Fulfillment puts an end to the latter; but in the face of one desire fulfilled, at least ten are given up. Further, desirousness lasts long time, its demands continue *ad infinitum*; fulfillment is brief and sparse in measure. But even final satisfaction is itself only illusory: fulfilled desire makes way at once for a new one; the former is an error that has, the latter still has not, entered into one's cognizance. No object of willing, once attained, can give lasting, unabated satisfaction, but it is always only like the alms tossed to a beggar, gets him by for another day of life so as to renew his torment tomorrow.

Therefore, so long as our consciousness is filled by our will, so long as we are given over to the press of desires with its constant hoping and fearing, so long as we are subjects of willing, lasting

happiness or rest will never come to be for us. Whether we give chase or flee, fear disaster or strive for enjoyment, it is in essence all the same: concern for will with its constant demands, in whatever form they take, fills and perpetually moves our consciousness; but without rest there is altogether no possibility of true well-being” (Schopenhauer, pp. 240-241).

It may be overmuch to lay a paradigm of restless, tormented information seeking at the feet of a narrow model of cognition utilized in previous IR research. But an affectless problem-oriented model of seeking, without reference to a broader social benefit or utility, approaches a strict instrumentalism that is at the heart of Schopenhauer’s pessimism. This is particularly true when paired with critical notions of information found in Day’s (2014) recent book or Postman (1985, 1990), or the kinds of querying documented by Noble (2013). In the age of Google, information seeking is an endless churn of searches regarding Gene Wilder’s death, fantasy football and Colin Kaepernick’s protest of the American national anthem (these are three of the top trending search topics on Google for the USA for the period from mid-August to mid-September, 2016).

How does consciousness raise itself above the merely instrumental to deeper levels of understanding and self-awareness? For Schopenhauer, the mind is capable of contemplating things as they are in themselves, as opposed to their narrow utility in relation to the knowing subject, once it becomes aware of the nature of the will. One way to escape the will is through asceticism. But another way, appropriate here, is through the esthetic contemplation of the sublime, particularly art and nature, which is accomplished when the knowing subject merges with the perceived object and experiences their unity indicated by the common presence of will in both the subject and the object. Overcoming will is an overcoming and cessation of desire, a nirvana-like transcendental death. Achieving the sublime is a rare event, not one that a current day Schopenhauer would associate with the seeking process while browsing pornography. But it does establish the esthetic mode of cognition as a method for transcending cognition in its narrow instrumental form.

Most phenomenologies of esthetic experience, including the work of Merleau-Ponty, do not shed much light on the information-seeking process. The theories emphasize affect and perception, and provide ontological justification for it, and integrate that theory with the presence of modern, particularly impressionist, painting. But they give little or no sense of purpose for the activity, and there seems to be no particular motivation for participating in esthetic experiences – to a degree, they just simply are. Dufrenne (1973) is the most complete treatment of a phenomenology of esthetic experience, and while it points to affect as a central element of the experience, it does not describe how esthetic experiences differ from other modes of being.

Instrumentalism at the heart of pragmatist philosophy, so how do pragmatists like Peirce and Dewey reconcile ego-centered pragmatism with a more aspirational civics? For Dewey, it was to develop a theory of esthetic experience that integrates the individual with his or her environment, and predisposes that person toward participation in civic life. Dewey’s position, according to Westbrook (1991, p. 391, quoting from Dewey’s *Art as Experience*), says:

Life [...] was an ongoing transaction between an organism and its environment. This transaction was marked by recurrent phases of equilibrium and disequilibrium: “the organism falls out of step with the march of surrounding things and recovers unison with it – either through effort or by some happy chance.” If the transaction between an organism and its environment became too disharmonious, the organism died. If the rhythm of alienation and restored equilibrium did not enhance the activity of the organism, it merely subsisted. Growth occurred when the organism was enriched by recovery from temporary disequilibrium. “Life grows when a temporary falling out is a transition to a more extensive balance of the energies of the organism with those of the conditions under which it lives” (*AE*, 19-20). Growth was then note merely quantitative but qualitative, the development of “a higher powered and more significant life,” and when growth occurred “the moment of passage from disturbance into harmony is that of intensest life” (*AE*, 22).

For both Schopenhauer and Dewey, “the normal processes of living” (Dewey, 1935, p. 9) is a series of moments of discord between the individual and his or her environment. “The career and destiny of a living being are bound up with its interchanges with its environment, not externally but in the most intimate way” (p. 12). These moments are affective, felt as unmet desire or suffering and prompt the application of instrumental knowledge for their resolution. For Schopenhauer, absent the rare encounter with the sublime via transcendental knowledge, once the desire or need is sated, and the cycle continues. For Dewey, these moments of need could be met with reflex or instinct, like Schopenhauer. Or humans could rely instead “on the more flexible resources of thought, language and culture [...] rising to an unprecedented level of growth because of their ability to saturate the world with meaning” (Westbrook, p. 392). For Schopenhauer, these moments of growth are rare, a reconciliation of the finite with the infinite, a welcomed end of striving. For Dewey, growth is not so dire, but a daily occurrence, though often overlooked.

Esthetics has long concerned itself with the nexus of affect, perception and judgment, but has generally focused on interactions with esthetic objects, particularly the arts. Dewey, on the other hand, was not primarily focused in art objects, their composition or evaluation. Instead he wanted to describe the events that make up one’s life, drawn from everyday experience, that provide opportunity for growth and social integration – the esthetic experience. These events are esthetic because they occur primarily through the senses, in the world, and occur over time. They are events of perception, affect and cognition, and articulate their connections. Dewey’s notion of esthetic experience is, in a way, an attempt to describe the events that make up your life – events that are drawn from our everyday experiences. As he states in 1935 in his book on the topic, *Art as Experience*, “This task is to restore continuity between the refined and intensified forms of experience that are works of art and the everyday events, doings, and sufferings that are universally recognized to constitute experience” (p. 2) (Dewey, 2005).

Dewey was interested in art as part of the esthetic experience because it was illustrative, but not because it was sole or even primary method for engaging in such an experience. Esthetic experiences occur with art, as moments that shape a person’s cultural and civic life, but art is not their source. For Dewey (2005), “an experience is a product, one might almost say a bi-product, of continuous and cumulative interaction of an organic self with the world” (p. 229). “The intelligent mechanic engaged in his job, interested in doing well and finding satisfaction in his handiwork, caring [...] with genuine affection” (p. 4) is in the midst of an esthetic experience. One way in to an experience is to become absorbed in it: people who are engaged in their work do it with care and are satisfied with its completion. The experience is emotional, initiated by frustration, desire or disharmony, and completed to emotional satisfaction, for when perception, activity and experience are joined, a person feels a harmonious integration with his or her social environment. At its highest level, esthetic experience can propel an individual to “inclusive ideal ends, which imagination presents to us and to which the human will responds as worthy of controlling our desires and choices” (Dewey, 1935, 1981-1992, p. 30). Emotion, and its transition from desire to its completion, is a unifying aspect of the experience. Quoting Coleridge on the experience of reading, Dewey states (p. 6) that the person is carried forward through the experience “by the pleasurable activity of the journey itself.” Dewey believed that these could be fairly frequent events, as he was interested in “recovering the continuity of aesthetic experience with normal processes of living” (p. 9).

It stands to reason that not all experiences are brought to this level of successful completion. Daily life can be dull, posing routine problems that can be satisfied with routinized solutions, like a daily commute. Such experiences are inchoate; they provide no satisfaction or opportunity for growth in their resolution. Life also poses insurmountable problems to which we simply succumb.

When problems – including information problems – are routine, and their resolution is purely a matter of instrumental intellect, then the labor required to complete them is dreary, and we seek to complete the work with the most efficient means possible. The conceptualization of information seeking as narrowly cognitive and almost purely instrumental in nature is the reason why Zipf's principle of least effort has been an integral information-seeking theory. However, when information seeking is viewed as part of a successful esthetic experience, the labor can be absorbing, and satisfying. Even in our extended example of porn seeking – not itself a refutation of instrumental seeking or an example of an esthetic experience – the browsing is pleasurable. Thus, alongside the principle of least effort we would pose the principle of maximum pleasure. There is not much to cite in the field of information studies to justify this principle, though clearly the pleasure principle has a long history in the realm of human thought, including Epicurus and Gerson (1994) and as a recurring concept in the work of Freud (1900/1965, 1916/1977, pp. 356-357, 1930/2010). Simply, all other considerations being equal, given a choice among alternatives, people will chose the most pleasurable action or item. Axiomatically, we treat the principle of least effort as a special case of the principle of maximum pleasure, for cases where the effort of locating and using documents is unpleasurable, we could write a corollary of the principle of maximum pleasure as “for unpleasurable activities, given a choice among alternatives, people will chose the least unpleasurable action or item.”

There is a full range of affect that we fold under the term pleasure. What we would first like to acknowledge is the full range of uses we can find in the documentary universe – “information” to be sure, but also the range of affect we feel while using those documents, from the vast pleasure of discovery of something new and exciting, the shock and repulsion we experience in a horror film, the masturbatory uses of pornography, the provocation to dance to a piece of music, the many small reactions from laughter to approbation we experience when reading fiction and anger at reading a news item. The uses of documents and the emotions we experience in their use are myriad.

But also, and perhaps of greater consequence for those who want to understand information seeking, the successful resolution of the information problem via seeking can be pleasurable in itself. When the esthetic experience is characterized by discovery, the act of seeking can be fun: mastering an IR system, the unfolding of learning, the gathering of information on a topic of interest such as Hartel describes. The successful completion of the discovery process can be rewarding. Or, if the seeking and use is part of a larger esthetic experience – a large personal project, or even just as part of the planning process for an evening out with friends, the esthetic experience results in the pleasure of personal growth, the pursuit of meaningful activities and integration with one's social and physical environment.

Our example of the browsing of pornography is not necessarily indicative of the presence of an esthetic experience. In most ways, our example better illustrates the instrumental and reflexive completion of a (sexual) desire. But the presence of embodiment, perception and affect demonstrates the need for a cognitive model that incorporates these elements. Furthermore, these elements, once recognized as such, are seen as the components of an esthetic experience. A theory of esthetic experience, such as Dewey's, better accounts for the full possibility of information seeking and IR system use: like a theory based on narrow cognition, it describes the inchoate experiences where seeking is routine and instrumental; it accounts for the origin of seeking as rooted in anxiety and uncertainty when that is the circumstance; and, unlike other models, it accounts for when information seeking results in personal growth and social integration, and in pleasurable conclusion. Furthermore, in this last instance, a theory of esthetic experience accounts for our highest aspirations for the development of information systems. Failing to account for these experiences not only means our information-seeking theory is incomplete, but results in dreary, narrowly utilitarian information systems.

Ultimately, the effort to view information seeking as an esthetic experience is to recognize the role of perception and affect in the process. While seeking, we judge documents not only to be relevant or irrelevant in the context of what we already know, but we also respond to them, emotionally. We find humor in one document, affirmation in another, disgust in a third. We judge the most important and challenging documents one way when we first encounter it, and close it feeling another way; or they provoke multiple reactions simultaneously, like aversion and wonder.

Re-centering the role of affect in the assessment of documents also allows us to see its role in our use of IR systems. While we traditionally judge IR systems by their ability to return typically relevant material, awareness of affect allows us to understand our preferences for one IR system over another by a more complete regime of evaluation. One enjoys searching on Google, for example, or hates Netflix's categories for browsing. Such evaluations deserve to be teased apart via an analytic, but at the core is an emotional reaction to the IR system itself. Recognition of emotion prompts us to characterize our interactions with IR systems as esthetic, and start treating beauty and other ways of engaging people as an important component of IR system design. A narrow instrumental view of IR system has yielded ugly, dreary IR systems, like colorless bland clothes: highly functional, with lots of pockets, but ultimately uncomfortable to wear.

The death of information seeking

The presence of affect and the other elements of an esthetic experience alert us to the possibilities offered by those experiences: personal growth, and harmonious integration with our physical and social environment. Our study of porn browsing also indicates one other result: that the browsing and use of documents in IR system have become increasingly integrated to the extent that it may no longer be possible – at least for those possessed with smart phones, laptops and capable of reflexive casual use of networked technologies – to distinguish information seeking as a separate process.

Classical theory in information seeking, such as Taylor (1968), describes information seeking as a prior and separate to the actual retrieval and evaluation of information. This model made sense for two reasons. First, Taylor sought to understand the separate components of the information seeking phase, which Taylor characterizes as bringing felt visceral information need to consciousness, formally stating it to him or herself and then finally articulating a compromised query that is constrained by the anticipations of how IR systems are expected to function. Second, the IR systems in use when Taylor articulated his theory, such as library catalogs, were often physically and temporarily removed from the place where the information problem was initially encountered, and where the retrieved documents would be evaluated. Often, queries were entered during the day, at the library, and the catalog ran in batch mode, at night. Citations were retrieved the next day.

As systems became increasingly interactive, scholars updated theories of information seeking. Swanson (1977) and Bates (1989) are two such examples. Swanson's analyses of IR system evaluation, particularly the Cranfield studies, led him to propose that the search query (i.e. Taylor's compromised query) could be reformulated based on the results of earlier searches of the same information problem. Bate's cognitive model of information seeking stated that the information problem itself evolved over time as the seeker browsed through various systems and interacted with documents.

The question is whether information seeking is now a separate activity, or whether it has become so integrated into the generalized interactions with information that it has ceased to become its own activity. Once engaged, a system typically provides multiple options to the user in the selection of specific documents. While we describe this procedurally, like Taylor, we are in fact enmeshed in these systems, from phone to laptop to dashboard to books, and we turn from one to the next without consciousness: text a friend, look something up on IMDB

(Internet Movie Database) while listening to the Dodger game on the radio, turn to Facebook, go back to the newspaper; aside from direct personal interactions, or engagements with media are the stuff of our lives, and the use of communication technologies to intermediate those personal interactions is increasing. And throughout these interactions are colored by emotion, much of it motivated by pleasure, though certainly the reality principle intervenes and immediate pleasure is deferred for a later time, where it may be repaid with an increase.

The search and browsing functions in various websites and applications are now highly integrated, a far cry from the first online catalogs. We search for movies now the way we once searched for television programs: “what’s on?” While perusing film reviews, a single hypertext link will answer the question “what other movies has that person directed?” Whereas the search for information (via a catalog) and reading (a book) were once markedly differentiated, now they blur, particularly in online environments, to the extent to be inseparable.

Our expansion of cognition to include unconscious behavior also has corollary here. Narrow cognitive models were compatible with the kind of cognitive controlling (sometimes called executive functioning) required to use IR systems that were contemporary with the development of cognitive theories of information seeking. IR systems were unfamiliar, required expertise, and required planning in order to use them, all functions of cognitive control. “Executive functions (EFs) make possible [...] taking the time to think before acting; meeting novel, unanticipated challenges; resisting temptations; and staying focused. Core EFs are [...] response inhibition (self-control – resisting temptations and resisting acting impulsively) and interference control (selective attention and cognitive inhibition)” (Diamond, 2013, p. 135). As search and browse functions are increasingly integrated into systems and our lives, we can lose ourselves in the stimulus they provide – many authors report having to shut off network connections while they write, as they are otherwise unable to inhibit the stimulus of browsing on the internet. Information seeking and searching have migrated, at least in part, from the control of cognition to the control of stimuli, ineluctably from the realm of the strictly conscious to the realm of semi-consciousness, and the unconscious.

But it is the increasing rhythm of information seeking and IR use that leads us, in particular, to declare the death of information seeking. The speeding up of life’s rhythms – including the blurring of labor and leisure, and private and public life, has long been noted as a feature of modern industrial and post-industrial life. What is clear is that information seeking and information system use have entered our everyday lives, and at the tempo of our lives. What was once a separate activity that stood apart from other aspects of our lives – including other aspects of our information lives – has now become mixed in, marbling our lives, and subject to the full range of our cognitive behaviors and practices.

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