

# Information landscapes as contexts of information practices

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## Abstract

The article examines the strengths and limitations of the analogy of information landscapes proposed by Annemaree Lloyd. The analogy offers a novel approach to the conceptualization of the spatial contexts of information practices. Drawing on the ideas of metaphor analysis, the analogy is scrutinized by comparing the similarities between its source domain, that is, natural landscape, and target domain, that is, information landscape. The study identified three main aspects of the analogy: (1) information landscapes as spaces affording the accomplishment of information practices, (2) information landscapes as spaces entwining physical and imaginary qualities and (3) information landscapes as socially constructed spatial contexts of information practices. The findings suggest that the construct of information landscapes represents a spatial analogy in which the properties of the source domain partially elucidate the nature of the contexts of information practices. The analogy works best with regard to similarities between affordances offered by natural landscapes and information landscapes. The major limitation of the analogy deals with difficulties to map physical features of the source domain onto the cognitive and social qualifiers of the target domain.

## Keywords

Analogy, context, information practices, information landscapes, spatial context

## Introduction

Since the 1990s, there is a continuing research interest in the ways in which contextual factors affect information behaviour (Agarwal, 2017; Courtright, 2007; Dervin, 1997; Huvila, 2019). Studies examining space-related contextual factors have been particularly popular (Gibson and Kaplan, 2017; Savolainen, 2006). Researchers have identified a number of spatial constructs such as *information environment* (Lievrouw, 2001), *information grounds* (Pettigrew, 1999), *information fields* (Johnson, 2003), *information horizon* (Sonnenwald, 1999), *information landscapes* (Lloyd, 2006), *information space* (Cisek and Krakowska, 2019), *immediate information spaces* (Hartel and Thomson, 2011), *information worlds* (Jaeger and Burnett, 2010) and *small world* (Chatman, 1996).

The above examples indicate a rich variety of related constructs, a kind of ‘conceptual geographies’ that have been developed to depict space-related contexts in which information practices take place (Greyson et al., 2017: 150). Many of these constructs such as information environment and information worlds incorporate metaphorical elements whose meaning may remain unclear. For example, as Yu (2012: 3) has pointed out, the term *information world* has often been used ‘in a rather cursory manner with ad hoc connotations’. This approach has resulted in that

information world has merely been taken ‘as a convenient code to express a physical, virtual or temporal space where symbolic resources abound’ (Yu, 2012: 3). The present investigation was inspired by Yu’s (2012) critical notion concerning the need to clarify the meaning of space-related metaphorical constructs. I realized that the problem dealing with ad hoc type definitions of key constructs also applies to other conceptual geographies qualified with the term ‘information’. As a contribution to this topic, the present study concentrates on the construct of *information landscapes* proposed by Annemaree Lloyd. In recent years, the above concept has become popular particularly in studies of information literacy (IL) and information practices (Allard and Caidi, 2018; Burnett and Lloyd, 2019; Lloyd and Wilkinson, 2019). Interestingly, Lloyd (2012: 778) has defined information landscapes as an analogy, not a metaphor. This approach opens a new perspective to the study of spatial contexts of information practices because different from metaphors, analogies are not merely descriptive figures of speech; analogies can also explain

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things. There is a need to clarify the meaning of spatial analogies because they hold considerable potential in facilitating the understanding of contextual factors in terms of more familiar concepts. The clarification of the nature of spatial analogies such as information landscapes is also important because there is a danger that a narrow or literal understanding of analogies would diminish their explanatory power.

To examine the above issues, the study makes use of the ideas of metaphor analysis because analogy is a type of metaphor. An analogy maps the similarities of entities from a concrete *source domain* to a *target domain* that is abstract in nature (Holyoak, 2012; Lakoff and Johnson, 1980). Thus understood, the analogy of information landscapes would suggest, for example, that there are similarities in the ways in which forest paths enable hiking (source domain) and the ways in which information sources available at a workplace enable information seeking progressing from a source to another (target domain). However, would the analogy of information landscapes be that simple? What are the strengths and limitations of the analogy? The main goal of the present study is to examine how Lloyd employed the analogy in her definition of information landscapes and how this can be strengthened by a more systematic comparative analysis between the source and target domains. By answering these questions, the present study contributes to the conceptual clarification of the nature of spatial contexts shaping information practices.

The rest of the article is structured as follows. First, to give background, the concepts *landscape*, *information landscape(s)* and *analogy* are introduced, followed by the specification of the research setting. The most part of the article will be occupied by the 'Findings' section. The last sections discuss the findings and reflect their value.

## Background

### *Landscapes and information landscapes*

In general, *landscapes* can be understood as 'bounded spaces in which human behaviours occur' (Branton, 2009: 51). Geographers have traditionally used the term *landscape* to refer to a perspective view of a portion of the material earth surface that can be perceived by humans via the senses, especially vision (Fabrikant et al., 2010: 255). There are two main types of landscapes. *Natural landscapes* are considered to be environments that have not been altered by humans in any shape or form. Natural landscapes are typically experienced on the curved two-dimensional surface when hiking on trails, for example. *Cultural landscapes* are different in that they refer to environments that have been altered in some manner by people (Spencer-Wood and Baugher, 2010). Urban environments exemplify cultural landscapes in that they contain elements such as buildings with multiple stories, bridges and

subway systems (Fabrikant et al., 2010: 257–258). The above examples draw attention to human activities that various spaces afford (Gibson, 1986). However, from the viewpoint of humanities and social sciences, landscape is not simply a physical container for behaviour because the most pertinent issues deal with the relationships between a place and human behaviours that occur within it. This notion is relevant for the study of the construct of information landscape(s), too.

Early examples of the use of the concept of information landscape date back to the beginning of the 2000s. Chen et al. (2002) examined navigation in the networked information sources and proposed that an information landscape is among the most appealing design options of representing the essence of distributed information resources to users. Somewhat later, Skovira (2005) proposed the term *informational landscape*. It was used synonymously to *information ecology* and *infoscape*, with the intent of developing a model for designing organizational information systems. More recently, Lee and Butler (2019) proposed the theory of *local information landscapes* to examine how local information is fragmented across different information sources. Another recent example of the use of the concept of information landscape is offered by Haines et al. (2019). They examined the information landscape of indigenous elders' knowledge and cultural practices. In this particular context, the term *information landscape* refers to textual knowledge mapping of individual cultural practices and experiences, which constitute a holistic and dynamic knowledge system.

So far, the most influential proponent of the construct of information landscape is Annemaree Lloyd. Her approach to this concept differs remarkably from the above studies because the main attention is devoted to information landscape as a major context of information practices. An early characterization of the construct of information landscape was presented in Lloyd's (2006) article on IL landscapes. Drawing on her (unpublished) PhD dissertation into the nature and manifestation of workplace IL among a group of firefighters, Lloyd (2006: 570) proposed that IL should be defined as 'the ability to know what there is in a landscape and to draw meaning from this through engagement and experience with information'. From the viewpoint of firefighters, information landscape as a major context of IL appeared as a complex constellation of social and physical (embodied) factors, coupled with the availability of recorded information (documents). To emphasize the diversity of such contexts, Lloyd prefers the plural form of the companion words, that is, *information landscapes*.

The characterizations of information landscapes have been elaborated further in Lloyd's later writings. In the textbook titled *Information literacy landscapes: Information literacy in education, workplace and everyday contexts*, the term *information landscape* refers to the broad contexts or settings through which IL has been researched (Lloyd, 2010:

9). Another meaning of the term is ‘communicative space’ through which people develop identities and form relationships based on shared practices and ways of doing and saying things. More specifically, information landscapes are depicted as ‘intersubjectively created spaces that have resulted from human interaction, in which information is created and shared and in which information eventually sediments as knowledge’ (Lloyd, 2010: 9). The nature of information landscape is elucidated by comparing it to physical landscape: similar to it, information landscapes evolve; their ‘social, historical, political and economic layers are deposited to form the foundations of the intersubjective space’ (Lloyd, 2010: 9–10). In her book, Lloyd also made one of the first references to information landscapes as an analogy. However, no detailed explanation is offered about why information landscape was chosen as the label for the major context of IL and information practices. Lloyd (2010: 141) just pointed out that

by using this analogy of landscape and how people come to know place and space, I hope to convey some of the complexities we face when trying to understand information literacy as a holistic socio-cultural practice and how this practice is manifest in a particular landscape.

The above characterization alludes that the construct of information landscapes is highly complex and difficult to explain in concrete terms, despite a clarifying comparative reference to physical landscape.

In a later study, the analogy was justified by the need to elucidate the people-in-practice perspective of IL and to introduce the epistemology of this perspective (Lloyd, 2012: 778). To this end, an information landscape was described as an intersubjective space that represents the range of modalities (epistemic, social and physical) and types of sources that people draw on to inform their practice. The features of such landscapes were further specified by proposing that ‘within any setting there are many landscapes’ (Lloyd, 2012: 778). First, meta-practices, which represent one type of landscape, shape other practices and reflect information specific to the broader discourses and narratives of the setting. Second, meta-practices are constituted by smaller practices, thus representing other types of landscapes where the practice may be more specific. For example, nurses’ information landscapes are broadly constructed ‘around discourses related to clinical knowledge and practice’ (Lloyd, 2012: 778).

Thus far, the most detailed definition of the concept of information landscapes is formulated by Lloyd and Wilkinson (2016: 302). It is referred to as

the total relations that exist between people who engage in similar performances and through those performances develop similar ways of knowing and making meaning. Information landscapes are shaped via information modalities that have resonance with the site through performance, endeavour or

situation. The landscape is therefore formed and accessed through the semantic space (through language), materially (through analogue and digital mediums; through the use of material objects) and corporeally through performance and observation of performance (embodied practices).

This suggests that the construct of information landscapes represents a complex constellation of intertwined factors (semantic, material and embodied) that condition the ways in which people seek, use and share information and can become information literate.

### *The nature of analogies*

The core of analogy is to think about a new, typically more abstract area of knowledge, a *target domain*, by comparing it to a known and more concrete area of knowledge, a *source domain* (Lakoff and Johnson, 1980). In the case of the present study, the construct of information landscapes represents the target domain, while the source domain is depicted by natural landscape.

More specifically, *analogy* is a comparison between two objects, or systems of objects, that highlights respects in which they are thought to be similar (Bartha, 2019). Analogies are widely recognized as playing an important *heuristic* role, and they have been employed in a wide variety of settings to generate insight. Analogies differ from other types of domain comparisons in that they emphasize similarities in the relational structure across the domains, but not similarities in the attributes (Haglund, 2013: 35–36). For example, it is possible to present an analogy between the structure of the atom and a solar system, where the central atomic nucleus corresponds to the sun and stands in a relation to smaller orbiting electrons, the counterpart of the planets in the solar system. However, analogies go beyond surface similarities, that is, any shared attributes of the constituting objects. For example, a focus on the sun being warm and yellow would in fact give a misleading idea of the atom. Instead, a genuine analogy focuses on the shared principle between the source and target domains. For example, the atom and a solar system may be interpreted as two examples of central force systems (Haglund, 2013: 35–36). To compare, metaphor is a special kind of analogy in the sense that the source and target domains are always semantically distant (Holyoak, 2012: 234). The metaphor has the structure X is Y (e.g. ‘life is journey’), but metaphor goes beyond the literal truth of the sentence. Therefore, metaphors can be primarily approached as linguistic phenomena and figures of speech.

Similar to scientific models, analogies are representations in which certain aspects of a phenomenon are emphasized, while others are played down or completely ignored. The features of analogies can be examined by diverse criteria whose applicability varies from a context to another (Bartha, 2019).

The present study makes use of the ideas of material analogy proposed by Hesse (1966) because her approach is applicable for the examination of social scientific analogies such as information landscapes. The material analogy requires that the relations between the source and target domains must include similarities between observable properties; in the context of the present investigation, they can be exemplified by a forest path enabling hiking (source domain) and real-life observations (or perceptions) of how various information sources available in a workplace (target domain) enable information seeking. As discussed in the 'Findings' section of the present study, Lloyd's empirical studies on information practices provide support for the assumption that the main criterion of the material analogy can be met while examining the features of the analogy of information landscapes. As to the material analogy, Hesse (1966) regards observable similarities as metaphorical relationships between the two domains and labels them pre-theoretic because they draw on personal and cultural experience. In the case of the analogy of information landscapes, it is evident that Lloyd's empirical observations of the ways in which diverse groups such as firefighters and refugees identify information sources and seek access to them have offered her relevant personal and cultural experience of how space-related factors enable or constrain people's information practices.

One of the strengths of spatial analogies and metaphors is that they ultimately draw on material reality, be it ordinary physical space or commonsensical understandings of social proximity or distance between individuals (Silber, 1995: 346–347). For example, natural landscapes potentially provide a deep source domain for the creation of various spatial metaphors. This concrete, experiential facet of spatial analogies and metaphors is especially in accord with theoretical approaches that focus on practice constituted by concrete, tangible and embodied action. Combined with this concrete quality, spatial constructs are also appropriate to evoke the contextual aspects of social practices, including the practices dealing with information seeking, using and sharing. The power of spatial analogies and metaphors is based on that they allow people to grasp more abstract concepts by mobilizing concepts with which they are familiar in terms of everyday experience (Van Acker and Uyttenhove, 2012: 262–263). Therefore, spatial experiences tend to be particularly popular when attempts are made to explain and structure statements about abstract notions such as knowledge or information. On the contrary, spatial analogies tend to have limitations because the target domain – for example, information landscapes – is similar in some regard to the source domain, not the (natural) landscape as a whole. This means that the spatial analogy of information landscapes may only partially elucidate the nature of the contexts of information practices.

## Research approach and research questions

The literature review offered useful ideas for the analysis of the construct of information landscapes. To this end, the studies characterizing the nature of analogies appeared to be particularly useful. The research approach of the present study is based on two main perspectives on the study of analogies. First, the construct of information landscapes is approached in terms of material analogy by drawing on Hesse's (1966) study reviewed above. Most importantly, the material analogy deals with the requirement that the relations between the source and target domains must include similarities between observable properties. They can be exemplified by depicting the similarity between two contexts of human action: similar to a forest path which enables hiking step-by-step, a set of available information sources enables information seeking which proceeds stepwise from a source to another. The material criterion was chosen as a point of departure because it enables a realistic and sufficiently detailed approach to the study of the similarities of (natural) landscape and information landscapes. Second, the research approach is based on the assumption that the nature of analogies can be examined by analysing how an abstract area of knowledge – that is, target domain – is made intelligible by comparing it to a more concrete area of knowledge – that is, source domain (Bartha, 2019; Lakoff and Johnson, 1980). Finally, given that analogies are representations in which certain aspects of a phenomenon are emphasized, it is evident that the analogy of information landscapes may exhibit both strengths and limitations.

To examine the analogy of information landscapes in greater detail, the present study addresses the following research questions:

**Research Question 1 (RQ1):** As a spatial context of information practices, in which ways can the target domain of the analogy of information landscapes proposed by Lloyd be made intelligible by comparing it to the features of landscape (source domain)?

**Research Question 2 (RQ2):** What are the main strengths and limitations of Lloyd's approach to the analogy of information landscapes?

## Research material and analysis

As the study concentrated on the construct of information landscapes proposed by Lloyd, the gathering of the research material was begun by visiting the list of her publications available at <https://anniemlloyd.com/service/>. In addition, to identify other studies relevant to the research topic, seven major databases were searched: EBSCO Academic Search Ultimate, Google Scholar, LISA, SAGE, Science Direct,

Scopus and Springer Link. The search terms included information practice(s), information behaviour, context, spatial context, landscape, information landscape(s), information environment, information field, information grounds, information space, information world and small world. In addition, diverse combinations of search terms were used, for example, information landscape *and* information practice. The literature searches were intentionally extended beyond the construct of information landscapes to identify studies which would compare it to related concepts such as information environment and information world. The searches resulted in the identification of 106 potentially relevant studies published within the period of 1977–2019. It appeared, however, that many of these investigations are less relevant for the present study because they only repeated what has been written before about contextual factors of information behaviour, or used the term information landscape as a self-explanatory construct. After having excluded investigations of this kind, altogether 27 studies directly relevant for the present study were included in the final sample. Most of these studies include Lloyd's articles and investigations of other researchers making use of her ideas or wielding the concept of information landscape in different ways. The final sample was chosen by two criteria. First, the studies characterized information landscape(s) and related spatial constructs as contextual factors of information practices and human information behaviour. Second, these studies explicated in sufficient detail how the spatial features are constitutive of such constructs.

In the analysis of the above material, the model proposed by Treagust et al. (1998) was used. The model specifies the following steps for the interpretation of analogies:

1. Introduce the target domain;
2. Introduce the source domain;
3. Identify similar features across the domains;
4. Map the similar features explicitly;
5. Identify where the analogy breaks down;
6. Draw conclusions.

Steps 1 and 2 were described above in the subsections of the 'Background' section while introducing the concepts of landscape (source domain) and information landscapes (target domain). To take steps 3 and 4, the analysis was guided by Gentner's (1983) idea suggesting that in the identification of the source and target domains and in the mapping of their similar features, the analysis should be focused on comparatively few aspects from the source to the target. To achieve this, at the third stage (step 3), key features similar to source and target domains were identified by scrutinizing text portions referring to the features of landscape, for example, 'paths, nodes and edges' (Lloyd, 2006: 579), and information landscapes, for example, 'intersubjective space that represents the range of modalities (epistemic, social and physical) and types of sources

that people draw on to inform their practice' (Lloyd, 2012: 778). At the fourth stage of the analysis (step 4), similar features thus identified were mapped by scrutinizing how individual characteristics of the source domain correspond to the features of the target domain. More specifically, the relevant text portions identified at the previous stage were compared to find out the ways in which the features of the source and target domains are indicative of meaningful similarity elucidating information landscapes as contexts of information practices. This analysis offered answers to RQ1. At the fifth stage (step 5), the applicability and limits of the analogy were scrutinized by focusing on text portions indicative of cases in which meaningful similarities can be found between the features of the source and target domains. The analysis conducted at this stage answered to RQ2 dealing with strengths and limitations of the analogy. At step 6, the analysis was finalized by drawing conclusions from the main findings. In this context, the main features of information landscapes were compared to the constructs of information field and pathways, information grounds and information environment in order to elucidate the unique characteristics of the analogy.

## Findings

### *Information landscapes as spaces affording the accomplishment of information practices*

The analysis revealed three major aspects constitutive of the analogy of information landscapes developed by Lloyd and her associates. First, the information landscapes have been approached as spaces affording the accomplishment of information practices particularly in work-related and learning contexts. The significance of the concept of *affordance* is emphasized in Lloyd's early writings in particular. The basic idea of affordance is that the perceptual systems of any organism are designed to 'pick up' the information that is relevant to its survival and ignore the rest. The relevant information is about *opportunities* 'afforded' by the furnishings of the world: holes afford hiding in, cups afford drinking out of, trees afford climbing (Gibson, 1986). To depict the source domain, Lloyd (2006: 752; 2010: 138–141) refers to distinctive features of natural landscapes which are influenced over time by interrelated processes such as climate, erosion, deposition, tectonic forces and volcanic activity. Overall, however, the characterizations of the source domain are quite scarce: for example, (natural) landscapes are qualified as having 'paths, nodes and edges' (Lloyd, 2006: 578). In themselves, features such as these remain abstract and they are difficult to comprehend as spatial factors affording information seeking, for example. However, as discussed later on, the concept of 'path' has been used in an insightful manner in the development of the metaphor of 'desire lines' (Burnett and Lloyd, 2019).

Drawing on Gibson's (1986) ecological approach to visual perception suggesting that objects perceived in an environment can afford many different behaviours, Lloyd (2006: 572) characterized the features of the source and target domains by pointing out that 'structure and organization of the landscape affords a range of opportunities for people to engage with the sources of information that give the landscape its unique shape and character'. In this characterization, the expression of 'structure and organization of the landscape affords a range of opportunities' stands for the source domain, while the target domain is referred to as 'to engage with the sources of information that give the landscape its unique shape and character'. This suggests that similar to natural landscapes, information landscapes are approached as spaces of affordance. In the context of the target domain of the analogy, the concept of affordance generally refers to the 'invitational qualities', that is, opportunities afforded to individuals so that they can engage in the activities and interactions that are central to the values and practices of the workplace, for example (Lloyd, 2006: 578). Invitational qualities enable an individual to identify 'the kinds of knowledges (i.e. the multiple sites of knowledge that constitute being in the world) that are valued by members who are engaged or connected to the practice' (Lloyd, 2006: 572). Thus, people construct their information landscapes when they engage (connect) to a particular practice, for example, firefighting.

More specifically, the above depiction of the target domain suggests that an information landscape is not a separate space because it is inextricably intertwined with a workplace (practice)-related landscape. The latter incorporates affordances that relate to a range of opportunities, activities, symbols, artefacts and practices that the workplace as a space and the people who work in that space provide to facilitate learning and knowing (Lloyd, 2006: 572). The above assumption is well founded, and one of the strengths of the analogy of information landscapes is that it convincingly suggests how the similarity of the source and target domains is based on the idea of a common denominator, that is, affordance. Basically, affordances arise from the invitational qualities of workplace landscape which in turn offers a constellation of potentially useful sources of information. Hiking in a forest path and information seeking occurring in a workplace are similar in the meaning that both activities are afforded – to a certain extent – by physical and social structures. Both natural landscape and information landscapes incorporate physical entities, for example, path in a terrain (source domain) and printed manuals located in a workroom (target domain). However, the above source domain does not fully correspond to the target domain because the latter also refers to affordances related to the use of textual information which tends to be lacking in natural landscapes.

Another limitation in the comparison of the similarities between the elements of the source and target domains is

faced in the characterizations which specify the social features of information landscapes. According to Lloyd (2010: 10), 'information landscapes are colonized by the particular values, beliefs, understandings and ways of doing things that represent the interaction between people as they co-participate'. To make these qualifiers more intelligible, they cannot be directly compared to the features afforded by the natural landscape. The constellation of values, beliefs, understandings and ways of doing things is constituted by abstract entities that have no meaningful counterparts in the source domain. Therefore, regarding the aspect of affordance, the limitations of the analogy become particularly visible in cases in which it draws on the comparison of physical and social and cognitive elements.

More recently, Burnett and Lloyd (2019) have shed additional light upon the aspect of affordance by introducing the concept of *desire lines*. It is descriptive of both source and target domains. Drawing on the ideas of Gibson (1986) and Norman (1988), a desire line – a term adopted from physical geography – refers to

a representation of an intended and purposeful direction of travel which does not employ formally managed or directed routes across a landscape, but is reliant on the complimentary relationships between people and their environments which furnishes affordances described as opportunities for people to interact. (Burnett and Lloyd, 2019)

From the viewpoint of source domain, desire lines can be depicted as shortcuts offering quickest way from a place to another. Similar to making use of desire paths in physical terrain, people may take less obvious paths within an information landscape to get access to a piece of information. As shortcuts, desire lines exemplify particularly well how a certain part of a landscape – both natural and informational – can be shaped (reconstructed), thus enhancing the ways it affords human action. For instance, a refugee facing a fractured information landscape in her new home country may make use of their desire lines such as informal contacts to get a job, instead of using an expected or designated route by visiting a job centre (Burnett and Lloyd, 2019). Desire lines exist within physical as well as virtual (non-physical) contexts of information practices; routes of travel within and across information environments represent 'shortcuts between information nodes' (Burnett and Lloyd, 2019). These nodes act as information sources or access points, and may themselves be physical or virtual, existing in a myriad of forms including websites, databases, articles and people which aid in the formation and conceptualization of personal information landscapes.

As a description of the source domain, desire line is a more specific construct than (natural) landscape. Therefore, it is easier to capture the similarity between a physical desire line affording a shortcut for pedestrians (source domain) and desire line affording a quick access to information sources constitutive of an information landscape

(target domain). Common to both elements in the above domains is that such shortcuts save energy and time; in a way, both of them exemplify the use of the principle of the least effort (Zipf, 1949).

### *Information landscapes as spaces entwining physical and imaginary qualities*

Another major aspect of the analogy deals with the ways in which information landscapes are approached as spaces entwining physical and imaginary (non-physical) qualities. This aspect complements the picture of information landscapes as spaces affording the accomplishment of information practices. This is achieved by depicting information landscapes as spaces where information sources are located. Lloyd (2006: 578–579) emphasizes that regardless of context or the skills required to navigate and explore, IL should be viewed as a way of knowing about ‘how information is located within a landscape’. Similar to locating hiking paths winding in a natural landscape, information landscapes appear as a space enabling the identification of diverse sources of information. Again, however, the similarity cannot be interpreted literally because the objects of natural landscape are not necessarily informational in the sense of information available in documents, for example.

A further elaboration of the analogy deals with the ways in which such spaces are constituted by entwining physical and non-physical (imaginary) features. To clarify this aspect, Lloyd (2014: 53) points out that (information) landscapes are approached in the qualitative sense – ‘as not having a physical form, but as representing a knowledge space’ that has resonance with people who are involved in collective practices, endeavours or situations. In a later study characterizing information landscapes constructed by refugees, Lloyd (2015) specified this assumption by drawing on Somerville’s (2007: 149–150) ideas of ‘placemaking’ and ‘place literacies’ suggesting that place is ‘a specific local place . . . filled up by people, practices, objects and representations’. Place also refers to a ‘metaphysical imaginary place’. More precisely, for Somerville (2007: 150), the concept of place establishes a ‘space between grounded physical reality and the metaphysical space of representation’.

On this basis, information landscapes can be characterized as having ‘both physical and metaphysical characteristics, which are entwined and inseparable’ (Lloyd, 2015: 1036). However, ‘metaphysical’ does not primarily stand for a philosophical term because it refers to an imaginary entity, that is, an imagined space where things may be represented (Lloyd et al., 2017). Lloyd and Wilkinson (2016: 301) have specified the above picture by introducing a novel term, that is, *everyday spaces*. They are qualified ‘by their information characteristics, and the information resources they afford’. Everyday spaces may be physical, virtual or

emotional, but they exist temporally and spatially. Finally, Lloyd and Wilkinson (2016: 301–302) specify the relationship between everyday space and information landscape: each everyday space entwines with others to build the information landscape that is shared by people who are engaged in the project of mutual understanding.

The above characterizations elaborate the picture of information landscapes in that they are qualified as overarching contexts within which everyday spaces are embedded. However, the analogy of information landscapes becomes more complicated because its constituents – that is, everyday spaces – incorporate a set of physical, virtual, temporal, affective, cognitive and social qualifiers. Moreover, the idea of the inseparability of physical and metaphysical (imaginary) features of information landscapes leaves open the question about how a ‘specific local place’ would be related to natural landscape as a source domain. It is also difficult to see how the imaginary qualifiers of information landscape could be made more understandable by referring to the properties of natural landscape.

All in all, approaching information landscape as a ‘knowledge space’ which incorporates ‘entwined physical and imaginary characteristics’ results in a very broad construct, making it difficult to interpret how the physical qualities of the source domain would elucidate the nature of the analogy. Information landscapes can have physical and temporal properties, but the ways in which virtual, cognitive and affective qualifiers appear in natural landscapes are subject to multiple interpretations. Therefore, regarding the above features of information landscapes, the analogy of information landscapes works only partially. Overall, regarding the aspect from which information landscapes are approached as spaces entwining physical and imaginary qualities, the analogy works best when it depicts the similarities between the source and target domains by referring to spaces as locations of objects (e.g. hiking paths for outdoor enthusiasts/libraries as places where books are available for readers). The analogy is weakened when the target domain is qualified by imaginary properties entwined with physical properties.

### *Information landscapes as socially constructed spatial contexts of information practices*

Since her first studies, Lloyd (2006, 2010) has emphasized that information landscapes are not a constellation of stable factors facilitating or constraining information practices; rather, such landscapes are actively constructed by people. This assumption is central to the third major aspect of the analogy. The construction of workplace-related information landscapes occurs when an individual identifies practice-related sources of textual (recorded), embodied (corporeally experienced) and social information (e.g. a colleague’s oral advice), seeks access to information of the above types and uses sources of information to perform

work tasks (Lloyd, 2006: 572). However, the construction of information landscapes is not an action of solitary individuals. In contrast, it is social because the assumptions of what kind of information is valuable, and how to seek, use and share it is affected by the beliefs, norms and rules characteristic of a societal or occupational group. Again, the mapping from the source domain onto the target domain does not suggest a one-to-one similarity between how a natural landscape is shaped for the needs of outdoor activities, for example, and how a workplace-related information landscape is constructed.

To broaden the picture of contexts in which information landscapes are constructed, Lloyd et al. (2013: 131) have characterized *everyday information landscapes* constructed by refugees. Different from information landscapes intertwined with workplace landscapes, everyday information landscapes are associated with information that is required for participation in daily life. Information landscape of this type is an overarching construct within which many other subject-specific landscapes can also be recognized, for example, health and leisure. For the construction of an information landscape, it is important how the refugees connect with it, that is, how they operationalize ways of knowing on two levels (Lloyd, 2014: 53–54). The first level focuses on the information landscape's structure and on ways of knowing how the structure is shaped, how to navigate within the information landscape and how access to information is operationalized – it is therefore epistemological in nature. At another level, people engage with situated knowledges of the information landscape (the 'know why' knowledges). At this level, they are engaging with the situated knowledges of the information landscapes indicative of the ontological nature of the site of a practice, for example, knowledge related to health.

The above characterizations refine the picture of the target domain by depicting everyday information landscapes as subject-specific and socially constructed phenomena incorporating epistemological and ontological levels. However, with this elaboration, the analogy of information landscapes is even more difficult to interpret. Compared to the (re)construction of desire lines, for example, it is more demanding to identify similarities between the source and target domains because the properties of natural environment cannot be easily mapped onto the epistemological and ontological levels constitutive of the target domain. The epistemological level indicates how an everyday information landscape is shaped and how it affords information practices, while the nature of the ontological level indicative of the 'know why knowledges' is difficult to decipher from the viewpoint of an analogy. Again, the analogy works best when the similarities between the source and target domains are based on the comparison of relatively concrete instances of shaping the natural and information landscapes, for example, constructing desire lines. In contrast, the analogy loses its power when the construction of

information landscapes is depicted as an activity occurring at epistemological and ontological levels.

### *Information landscapes as sub-contexts of information environments and information ecologies*

As noted above, information landscapes can be qualified as overarching contexts within which everyday spaces are embedded (Lloyd and Wilkinson, 2016: 301). However, the construct of information landscapes can also be approached as constituent of a broader context, that is, *information environment*. In her early characterization of IL landscapes, Lloyd (2006: 575) pointed out that an individual can become information literate by passing through two phases. In the first phase, he or she develops individual workplace subjectivity and accesses an information environment (normally through text) which enables him or her to learn to act. In the second phase, the individual begins to 'engage with a landscape that reflects the social, historical, embodied and negotiated experiences of the community of practice and the sources of information valued by the community' (Lloyd, 2006: 575). These two phases of IL also attend to the tensions created when moving from 'artificially constructed environments created by text to real-world information environments' constructed through social and embodied practices (Lloyd, 2006: 575).

Lloyd's (2014) later study has shed additional light upon the relationships of the above constructs. According to Lloyd (2014: 53), information landscapes draw from 'larger and more complex information environments'. For example, a health information landscape is socially constructed and placed within a larger health information environment, which is in turn composed of a wide range of domain-specific and structural knowledges. Thus understood, a health information landscape may be centred on particular knowledge (e.g. diabetes) and ways of knowing how to access this knowledge (Lloyd, 2014: 55). By identifying and connecting with others already familiar with the health system, people become oriented towards the health environment and towards the various landscapes within that environment (e.g. routine medical vs chronic illness). This is important because connecting with health-related information people become familiar with the shape of the health information environment and begin to construct the paths, nodes and edges of their information landscapes.

The above characterization is illuminating because it suggests that information environment forms an overarching context within which there are information landscapes with diverse (information) pathways and desire lines providing access to various sources of information. However, along with the introduction of the construct of information environment, the interpretation of the analogy of information landscape is rendered more difficult because the nature of the source domain of the concept of information

environment remains unspecified. The picture of the target domain is complicated further by proposing that such landscapes are constructed ‘through access to social, textual and physical information modalities that are relevant to the practice, endeavour or situation’ (Lloyd, 2014: 53). Thereby, as Lloyd (2014: 53) points out, information landscapes can be viewed as complex ‘information ecologies, which frame particular discourses and narratives and thus entwine people within time and place’.

On the contrary, the introduction of a related term, that is, information ecologies may not clarify the nature of the target domain because the relationship between information ecologies and information landscapes remains unspecified. This is partly due to that the construct of information ecologies is metaphorical; the term ‘ecologies’ representing the source domain of the metaphor refers to the set of relationships existing between organisms and their environment. The reference to information ecologies is probably due to that the concept of information landscapes is informed by Gibson’s (1986) ideas of affordance whereby people take up opportunities furnished by the setting (Lloyd, 2015: 1037). These opportunities are provided by the information landscapes and are recognized through an understanding of what constitutes information and knowledge in a particular setting.

The relationship between information landscape and information environment is specified in a recent study conducted by Burnett and Lloyd (2019). They remind that to construct a way of being in the world, people interact with an information environment and draw from it to construct information landscapes, which reference the sites of knowledge and ways of knowing. This characterization suggests more clearly than Lloyd’s (2015) prior investigation that information landscape would be a subset of information environment because the formation of the latter is dependent on the former. This interpretation is in accord with Burnett and Lloyd’s (2019) view suggesting that in the first instance information environments appear as larger sites of stable knowledge, that is, epistemic sites about technical or material practices and ways of knowing, normative rules and regulations, traditions and histories. Therefore, information environments represent an ‘intersubjective dimension which references shared language, and mutual understanding about what constitutes knowledge and ways of knowing (e.g. cultural understandings about how to be a parent)’ (Burnett and Lloyd, 2019). This characterization exemplifies an overarching definition of information environment. Again, however, the question remains whether the characterization is so broad that it rather complicates than elucidates the analogy of information landscapes.

## Discussion

By focusing on the analogy of information landscapes proposed by Annemaree Lloyd, the present study contributed

to the study of spatial factors constitutive of the contexts of information practices. To examine this issue, two research questions were addressed. First, it was asked, in which ways can the target domain of Lloyd’s analogy of information landscapes as a context of information practices be made intelligible by comparing it to the features of landscape (source domain)? Closely related to this issue, the second research question dealt with the main strengths and limitations of the analogy.

The findings indicate that construct of information landscapes has been elaborated gradually by specifying its features and adding some new qualifiers. As a result, the nature of information landscapes as a spatial analogy has become more nuanced. Three major aspects of the analogy were identified:

1. information landscapes as spaces affording the accomplishment of information practices,
2. information landscapes as spaces entwining physical and imaginary qualities and
3. information landscapes as socially constructed spatial contexts of information practices.

Overall, the analogy of information landscapes represents a partial mapping from the source domain onto the target domain. The findings suggest that the analogy works best with regard to identifying similarities between affordances offered by natural landscapes and information landscapes. The construct of affordance makes it intelligible how human activities – though different in nature such as hiking in a forest path and navigating from an information source to another – are enabled (to some extent) both within the context of natural landscape and information landscape. In this regard, one of the strengths of the analogy is that its source domain – that is, landscape – is easily perceivable as an object of everyday experience and thus familiar with us. The analogy is also indicative of how natural landscapes as well as information landscapes are shaped in different and sometimes even unique ways, depending on what kind of entities (e.g. paths, hills, printed documents, networks of colleagues) are located or available in physical spaces. Importantly, the target domain elucidates information landscapes as sites, which afford the identification of information sources and facilitate or constrain access to them. Drawing on the idea of affordance, the attribute of desire lines exemplifies another strength of the analogy because the similarity between the source and target domains can be demonstrated in a concrete way.

On the contrary, the analogy of information landscapes has certain limitations because the features of the source domain cannot be unambiguously mapped onto the target domain. The limits of the analogy become most evident in cases in which attempts are made to identify similarities between non-physical attributes of the source and target domains. Social, cognitive and affective qualities attributed

to the target domain cannot be unambiguously made intelligible by comparing them to the properties of natural landscapes. This is because information landscapes – based on affordances offered by the information environments – result from social construction. It is a complex process composed of many social, epistemic and corporeal layers. For example, the nature of the social layer may not be directly elucidated by means of the analogy of information landscapes if this layer is approached in terms of *sociality*. It refers to a dynamic relational matrix within which human subjects are constantly interacting in ways that are co-productive, continually plastic and malleable, and through which they come to know the world they live in and find their purpose and meaning within it (Long and Moore, 2012: 41). Approaching information landscape as a ‘knowledge space’ exemplifies another case in which the analogy is difficult to justify. It is challenging to identify elements of natural landscape so that they would meaningfully indicate similarity with qualifiers characteristic of ‘knowledge space’.

This limitation becomes more evident in cases in which the target domain is depicted as a set of subject-specific constructs incorporating epistemological and ontological levels. More generally, when the elements of the target domain become more abstract, it becomes more distant from the content of the source domain, that is, natural landscape, thus rendering it more difficult to capture the core meaning of the analogy. One of the limitations of the analogy depicted in Lloyd’s early writings is that its source domain primarily refers to physical (natural) landscape whose ‘paths, nodes and edges’ (Lloyd, 2006: 579) can be experienced by means of human senses, primarily sight and touch. However, information practices are increasingly accomplished in ‘spaceless’ digital environments that are more difficult to depict in terms of physical places. The source domains of such environments might be better elucidated as networks, that is, connections between nodes, rather than physical places. The importance of this aspect is aptly acknowledged in Burnett and Lloyd’s (2019) recent study on desire lines by noting that they may also exist within virtual (non-physical) contexts. Desire lines of this kind may serve as virtual shortcuts between information nodes, thus offering access points to information sources.

The findings concerning the limitations of the analogy of information landscapes also suggest that it would not merely be explainable as a spatial construct. This is because in the target domain, spatial factors are intertwined with social qualifiers such as norms and values constitutive of the context of information practices. Similar finding was obtained in Savolainen’s (2009, 43–45) study, which compared the constructs of information grounds and small worlds. It appeared that local, physical places per se are not particularly interesting if they are reviewed separately from social factors. Ultimately, in information grounds, for example, social factors render spontaneous information sharing and seeking meaningful as something

that people do together when they are co-present and share the same physical space. This is also evident in the case of work-related information landscapes, if they are understood as a socio-spatial contexts in which people engage while accomplishing information practices relevant to task performance, for example.

To elucidate the unique features of the construct of information landscapes, they can be compared with the key characteristics of spatial constructs incorporating metaphorical elements. In this regard, the constructs of information field and information pathways, information grounds and information environment are most relevant because their source domains suggest the existence of real geographic space, different from metaphorical concepts such as information space and information worlds.

Distinct from the construct of information landscapes, the concept of *information field* exemplifies a spatial metaphor, not analogy (Johnson, 2003). Its source domain – that is, field – suggests a two-dimensional space. The target domain – that is, information field – leads to think that the context of informational phenomena is also a two-dimensional space where information seeking and information sharing take place. Johnson (2003: 750) described information field as ‘typical arrangement of information stimuli to which an individual is daily exposed’. It is assumed that the physical context in organizations serves to stabilize an individual’s information field and largely determines the nature of the information to which individuals are regularly exposed. A more dynamic picture of the metaphor of information field is obtained by approaching it as a space within which there are (information-seeking) *pathways* of diverse kind (Johnson et al., 2006). Similar to information field, the construct of pathway incorporates metaphorical elements because its source domain refers to paths that can be found in natural landscapes. Individuals can pursue their information seeking within an ‘information matrix’ formed by channels, sources and messages constitutive of pathways (Johnson et al., 2006: 572). Most importantly, the construct of pathways suggests that individuals can change the order in which alternative information sources are consulted, depending on the requirements of the task at hand, for example.

Interestingly, Burnett and Lloyd (2019) approached similar issues, although from a narrower viewpoint of desire lines offering shortcuts within an information landscape. It can be concluded that as a context of information practices, information field is less nuanced than information landscapes in that the former suggests the existence of a relatively stable ‘container’ where information practices simply take place. In contrast, the analogy of information landscapes exemplifies a dynamic context which is (socially) constructed, entwined with a workplace landscape, for example. The concept of pathways comes closer to the construct of information landscape because both constructs suggest that individuals make use of shortcuts offered by available information sources.

Different from the construct of information landscapes, the concept of *information grounds* emphasizes the aspect of temporally sensitive and transient places where information is occasionally encountered, sought and shared (Pettigrew, 1999). Examples of information grounds refer to locales such as medical clinics, hair salons and bookshops. The characterizations of the source domain of the metaphor – that is, ‘grounds’ – emphasize the importance of physical spaces as everyday arenas where people more or less spontaneously come together (Fisher et al., 2004). Information grounds such as these both enable and constrain information sharing and seeking.

Compared to the construct of information landscapes, the concept of information grounds suggests a more dynamic view on the context of information seeking and sharing because it emphasizes the significance of spontaneity, situationality and temporality of action. Information grounds is a context in which information is randomly shared and encountered rather than purposefully sought, while the analogy of information landscapes suggests that such activities are more purposeful and they tend to recur. Moreover, the analogy of information landscapes suggests that the contexts of information practices tend to be (temporally) more stable than information grounds. Nevertheless, a major characteristic of information landscapes is that they can be (re)constructed, as vividly exemplified by Lloyd et al. (2017) in a study on refugees facing fractured information landscapes in their new home countries and local societies.

Finally, the construct of *information environment* exhibits a broader context of information practices. This aspect is also emphasized in the conceptualizations of information landscapes because they are defined as subsets of information environments (Burnett and Lloyd, 2019; Lloyd, 2015). One of the relevant points of departure for the comparative notions is offered by Lievrouw’s (2001) conceptual model for information environment. In her model, the information environment is conceptualized from the standpoint of the information actor or group of actors. Lievrouw suggests that an information actor could conceivably inhabit several discrete or overlapping information environments depending upon activities and imperatives. Similarly, the ways in which Burnett and Lloyd (2019) have characterized the relationships between information landscapes and information environment provide support to the view that they may be perceived as nested constructs because the former is embedded within the latter.

Another relevant study offering the possibility for comparative notions was conducted by Brikše (2006). According to her, information environment refers to a set of factors, resources and processes, which demonstrate knowledge that has been accumulated and used by a specific society, community or individual (Brikše, 2006: 369). From this perspective, the concept of the ‘environment’ can be approached as the source domain of the analogy of information environment by referring to physical,

chemical or biological systems and sets of factors in which living organisms or communities with external factors exist (Brikše, 2006: 370–371). Similar to Burnett and Lloyd’s (2019) approach to information environment, the above characterization exemplifies a broad and flexible definition of environment. In the above studies, however, the characterizations of the source domain – that is, environment – are so broad that they may not offer much elucidation for the concept of information environment as a broader context of information landscapes.

## Conclusion

The analogy of information landscapes elaborated by Lloyd exemplifies a sophisticated approach to space-related contextual factors of information practices. Her approach to context comes close to the dynamic view advocated by Dourish (2004: 6; 22): ‘context isn’t something that describes a setting; it’s something that people do’ and that context ‘isn’t just “there,” but is actively produced, maintained, and enacted in the course of the activity at hand’. The findings indicate that Lloyd’s approach to the construct of information landscapes has evolved gradually since 2006. The nature of information landscapes as an analogy is characterized most explicitly in her early studies (Lloyd, 2006, 2010), while more recent investigations no longer emphasize this aspect. Nevertheless, the construct of information landscapes holds good potential for the elaboration of the ways in which people dynamically construct the contexts of information practices. The major strength of the (implicit) analogy is based on the insightful application of the ideas of affordance, as exemplified by the recent analysis of the construct of desire lines (Burnett and Lloyd, 2019). The findings also suggest that common to all analogies, the construct of information landscapes has certain limitations. As it is evident that the social, cognitive and affective features of information landscapes cannot be fully made intelligible by means of an analogy, future studies may also devote attention to the limits of the analogy.

Because the present investigation concentrated on the analysis of an individual construct, that is, the analogy of information landscapes proposed by Lloyd, further studies are required to elucidate the metaphorical nature of related spatial constructs, as well as to specify the interplay between contextual factors of other kind. As spatial and social factors are often intertwined, one of the potentially important research topics deals with their relationships, not only in terms of metaphors and analogies but also substantive categories depicting contextual features of information practices.

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