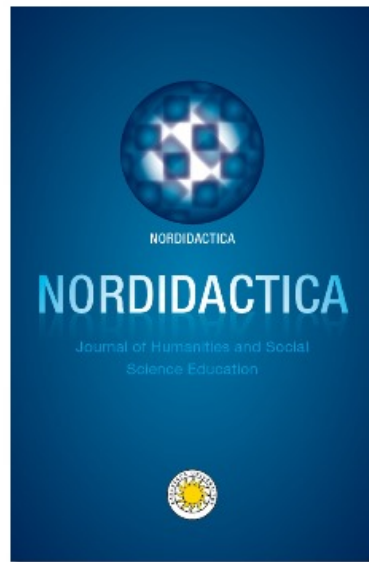


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A geographical reading of Roland Barthes: A smartphone model for the interpretation of photographs in geography education

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Abstract: This article introduces a geographical reading of Roland Barthes's Elements of Semiology, originally published in 1964. In his text, Barthes introduces the semiotic concepts of "language and speech," "signifier and signified," "syntagma and system," and "denotation and connotation." Upon these semiotic concepts, this article builds a method for interpreting photographs from the geographical point of view. In the field of geography, the interpretation of photographs is to some extent taken for granted, because geography as a discipline has always been visually oriented—especially thanks to the use of maps. However, geography has produced practically no systematic attempts to develop a visual theory. This article introduces—not a visual theory but rather—a "smartphone model" for the interpretation of photographs in geography education. Photographs taken in Taupo, New Zealand (2013) and in New York City, United States (2008) are used to exemplify Barthes's theoretical concepts. However, it is not argued that geography students should know Barthes's terminology, such as denotation and connotation. Instead, they should be aware of the ways in which these concepts affect the meaning-making processes. That is, the smartphone model brings together four fundamental aspects—visual elements, textual elements, framing, and application of geographical knowledge—that should be taken into account when interpreting photographs in geography lessons. This article integrates geography education, structuralist semiotics, and visual methodologies.

KEYWORDS: ROLAND BARTHES, GEOGRAPHY EDUCATION, GEOGRAPHICAL HINTS, GEOGRAPHICAL VIGILANCE, INTERPRETATION OF PHOTOGRAPHS, SEMIOTICS, SMARTPHONE MODEL, VISUAL METHODOLOGIES

About the author: Markus Hilander is a university lecturer at the Faculty of Educational Sciences, University of Helsinki. His doctoral dissertation (2017) dealt with the interpretation of photographs from a semiotic and geographical perspective. His research interests are environmental education, geography education, and visual methodologies.

Introduction

Visual methodologies have always been present in research (Mustola, Mykkänen, Böök & Kärjä, 2015, p. 229). Geography as a discipline has also always been visually oriented especially because of the use of maps (Cosgrove, 2010, p. 1; Muukkonen, 2018, p. 14). However, the combination of geography and semiotics is rather rare even though geographers take advantage of different sorts of signs, for instance, in their maps and semiotics is most often described as “the study of signs” (Hilander, 2013, p. 1). In addition, geographers have tended to be interested in the “final” meanings of visual representations, rather than the processes during which the meanings are being produced; in this case, “re-presentation” is written with a hyphen, emphasizing that it is not an objective presentation of the world but a reproduction (Hilander, 2016a, p. 396).

The power of visual culture is influencing the lives of young people more than ever. The vast production of visual re-presentations, as well as young people’s skills in visual literacy, are much discussed topics (Hilander, 2016b, p. 70; see also, Seppä, 2007, p. 15). In the Finnish comprehensive and upper secondary school curricula, geo-media tools and resources are being introduced as a new set of skills. By geo-media skills, it is referred to the diverse use of maps, diagrams, media, images, videos, literacy sources, oral presentations, and geographical information systems as well as other methods of acquiring and presenting geographical information (Opetushallitus, 2015, p. 146; see also, Hilander, 2016b). Therefore, geo-media skills also highlight the importance of being capable of interpreting photographs and other visual texts.

However, Veronica Hollman (2014, p. 137) suggests that the role of images in the field of geography should be rethought. According to Hollman, this is because images are frequently used in geography as descriptive illustrations of arguments instead of as active players in the construction of geographical knowledge (see also, Rose, 2008, p. 151). That is to say, the time when geography teachers are only (1) using photographs as (2) illustrations for illuminating (3) specific details of a particular geographical phenomenon to students should be over. Instead, the genuine interpretation of photographs includes questions regarding the “paradigmatic choices” that the photographer has made; for instance, why has the photo been taken in the first place, and what sorts of elements have been framed outside the photo? When conducting my own research (e.g., Hilander, 2016a, 2016b)—especially those studies of Finnish upper secondary school students interpreting photographs (e.g., Hilander, 2012, 2016c)—one question came into view: Does a method for interpreting (i.e., not only for using or demonstrating) photographs of geographical places even exist in the first place?

The research contribution that this study attempts to fill originates in Antje Schlottmann’s and Judith Miggelbrink’s argument (2009, p. 1), when they write that “geography has so far produced practically no systematic attempts to develop a visual theory.” Therefore, there is a strong demand for developing geographers’ and geography educators’ own visual theory regarding the interpretation of visual texts geographically. This leads to another question, a preliminary answer to which is provided in this article: How to build a method for interpreting photographs in geography lessons based on semiotic concepts?

Consequently, the goal of this paper is to read Roland Barthes's *Elements of Semiology* from a geographical perspective, and to build a smartphone model for the interpretation of photographs in geography education upon this reading. *Elements of Semiology* was originally published under the title of *Éléments de Sémiologie* in the French review *Communications* in 1964. The English translation was published by Annette Lavers and Colin Smith. In this article, a paperback edition first published in 1977 is used. The application of Barthes's semiotic concepts work as the basis for developing and elaborating a model for the interpretation of photographs from a geographical point of view. To illustrate Barthes's theoretical concepts, two photographs taken in New Zealand (2013) and in New York City (2008) are used.

Here, the main research questions of this article are presented collectively:

1. Does a method for interpreting photographs from a geographical perspective exist in the first place?
2. How does one go about building a method, based on semiotic concepts, for interpreting photographs that can be applied in geography lessons?

Before the smartphone model and its four parts are introduced, the ways in which geographers and geography educators use and interpret photographs in their research and teaching are explored in the following section.

Using and interpreting photographs in geography and geography education

By the term using photographs is meant the role that photographs have in capturing and recording the world as it is, as well as demonstrating details and structures of specific geographical phenomena (e.g., Rose, 2003). By the term interpreting photographs is meant the practice of applying critical thinking skills when interpreting photographs and their alternative meanings from different angles (e.g., Castree, Kitchin & Rogers, 2013). Finally, the different roles that photographs possess in geography and geography education will be explored from the viewpoint of semiotics, that is, in the language of semiotics. In other words, how is a photograph treated in geography from the perspective of semiotics?

Using photographs

Geographers have a tendency to exploit photographs in ways that emphasize *indexicality* (see, Malitsky, 2012). The Finnish Professor Janne Seppänen (2005, pp. 125–126) describes that “an index has a direct relation to its object. For example, footprints in the sand are indexical signs. A photograph taken by a camera is an index because the rays of light reflected from the object have physically drawn their mark on the surface of the film.” In other words, the indexicality of a photograph means that it has been a material part of the object it *re*-presents (Puustinen & Seppänen, 2013, p. 30). Thus, the camera is a device that produces indexical photographs that have a causal and material relationship to the photographed objects (Seppänen & Herkman, 2016, p. 18). Because of the indexicality, photographs are seen to offer ontological evidence for

a geographer; that is, places and geographical phenomena depicted in photographs are authentic and can be located on the earth, among other things, by using coordinates. Therefore, a photograph may appear as a more authentic piece of evidence of the world than a written text (Linkola, 2013, p. 26).

Because of the ontological evidence, photographs, aerial images, satellite images, and maps take on a strong, resilient *geographically mythic quality*. The concept of myth comes from Barthes (1957; see also, Fiske, 2005, pp. 115–121) who criticized the ways in which myths present cultural practices as innocent and unchanged, as if nature itself has dictated them. The myth, however, is nothing but a structure that seeks to present cultural narratives as natural and inevitable. As a result, myths *re-present* the social reality as monolithic, black and white. In this article, the geographical myth refers to the way in which photographs are taken for granted and as objective presentations of the world, although they do not present the world but *re-present* it (e.g., Crang 2003; Markwell 2000; Rose 2003). This kind of “truthful image of the world” is reinforced when people, for instance, upload images onto Facebook or view the San Andreas Fault on Google Earth (Hilander, 2013, p. 1). These *re-presentative* practices build so-called “imagined geographies” with which spaces, regions, places, and people are perceived and imagined (Cosgrove, 2010, p. 3; Renkonen, 2014, p. 32; Schwartz & Ryan, 2006, p. 6; Trudeau, 2006, p. 422). According to Antti Vallius (2016, p. 150), “the power of visual catalogues is primarily based on repetition of certain objects and views, which creates the feeling of familiarity, while replacing other possible ways in which the depicted environment could be interpreted.” In spoken language, iconography (i.e., iconic signs) often refers to this feeling of familiarity.

Antje Schlottmann and Judith Miggelbrink (2009, p. 1) write that “geography is primarily a discipline that *uses [sic]* images.” Previously, geographers tended to perceive photographs as presentations where “information is observable” (Raivo, 1996, p. 12; see also, Aitken & Craine, 2013, p. 253; Oldrup & Carstensen, 2012, p. 224). That is to say, the photograph was an objective result of a research (cf., a photograph) rather than a research method (cf., photography). This might partly be the reason why geographers have not pursued developing a visual theory of their own (see, Rose, 2003, p. 212; Schlottmann & Miggelbrink, 2009, p. 1). Jessica Jacobs (2016, p. 452) argues that geography lacks an independent research branch—such as human and physical geography—devoted to visual research because geography and visuality are indivisible.

In geography education, the object of a photograph—which carries the meaning and constitutes the space or landscape to be interpreted—is often acknowledged as geographical *per se* (see, Tarasti, 2004, pp. 93–94). In Finnish schools, for example, photographs are used to illuminate specific details of geographical phenomena, such as comparing young (high and great relief) and old (low and moderate relief) fold mountains. In this case, the content of the photographs is acknowledged as physical geography; but, does this make the actual semiosis (i.e., the meaning-making processes) geographical, too? From a semiotic point of view, it is not possible to divide photos into “geographically relevant” and “non-geographical” ones—especially because people do not interpret images objectively but through their own experiences (Hyvärinen, 2012, p. 223). Therefore, genuinely geographical visual material does not exist; instead, the

geographical standpoint from which to interpret photographs arises from epistemological interest towards spatial relations (see, Schlottmann & Miggelbrink, 2009, p. 5). In the terminology of Charles Sanders Peirce (1998)—one of the two major founders of semiotics—any visual *re*-presentation (i.e., the sign or representamen) can present geographical information (i.e., the object) to an individual, who interprets it from a geographically oriented perspective (i.e., the interpretant).

Interpreting photographs

Besides using photographs, geographers are also engaged in interpreting photographs. Since the textual and cultural turn in the 1980s and 1990s, geographers have been increasingly interested in the cultural, semiotic, and symbolic meanings of images (Linkola, 2013, Ryan, 2003; Thornes, 2004)—but perhaps not that much of the meaning-making processes (i.e., semiosis). At the same time, geographers have questioned the traditional visuality of cultural geography by highlighting the omission of power relations that are imbedded within maps, landscapes, paintings, and movies (Aitken & Craine, 2005 p. 251). Lately, photographs and photography in geography have been understood not only as *re*-presentational texts but also as communicational tools (Rose, 2014, p. 24). Photography is used, for instance, as a means of getting closer to studying people's everyday life (e.g., Oldrup & Carstensen, 2012; Pyyry, 2015). In addition, photography has been used as a performative methodology that highlights feelings, experience, and textures of places (Hunt, 2014).

In her book *Visual methodologies*, human geographer Gillian Rose (2012, pp. 19–40) introduces three sites at which the meanings of an image are made: the site of the *production*, the site of the *image itself*, and the site of its *audiencing*, that is, the site of where the image is seen by various audiences. According to Rose (2012, p. 346), “how an image is made, what it looks like, and how it is seen are the three crucial ways in which a visual image becomes culturally meaningful.” Each of these sites Rose explores from *technological*, *compositional*, and *social* perspective—which she calls the modalities. The technological modality concerns the tools and equipment used to make, structure, and display an image; the compositional modality concerns the visual construction, qualities, and reception of an image; and the social modality concerns the social, economic, political, and institutional practices and relations that produce, saturate, and interpret an image (Rose, 2012, p. 346).

When it comes to the production of an image, one can ask questions such as “When was it made?” “Where was it made?” “Who made it?” and “What technologies does its production depend on?” Questions about the image itself are, for instance, “What is being shown?” “What are the components of the image?” “Where is the viewer's eyes drawn to in the image?” and “What is the genre of the image?” Lastly, the site of audiencing can be approached with questions such as “Who are the audience for this image?” “Where was the image displayed for the first time?” and “How do different audiences interpret the image?” (Rose, 2012, pp. 346–347). These sites and modalities are one example of how cultural geography's relationship with visual materials has

shifted from the images itself towards the conditions of their production, circulation, and reception (Cosgrove, 2010, p. 4)

Exemplary research

As mentioned in the Introduction, the combination of geographical and semiological research is rather rare. This does not, however, mean that geographers would not be acquainted with semiology. Especially in the context of cultural studies, generally speaking, researchers do utilize a great deal of semiotic approaches, but they do not necessarily refer to semiotics or to the concepts created by semioticians (Hilander, 2013). This is the case, for instance, with Velvet Nelson's (2005) study in which the concepts of denotation and connotation are used as tools for analyzing images of tourist brochures, but Roland Barthes is not mentioned even once in the article. On the other hand, Kevin Raaphorst and his colleagues (2017) do name Barthes in their article in developing their critical-visual research approach by combining landscape architecture with visual semiotics. In the Finnish context, Ilkka Luoto (2008) and his research about geosemiotics might be one of the most known combinations of the two disciplines.

What sorts of visual materials have geographers used in their research, then? During recent decades, cultural geographers have employed "iconological analysis" developed in art history and have applied it to their research (Raivo, 1996, pp. 34–35). It begins with content analysis (i.e., pre-iconographical description), proceeds to the internal meaning-making processes (i.e., iconographical analysis), and finally attaches the found meanings to the wider sociocultural context (i.e., iconological interpretation) (Renkonen, 2014, p. 34; see also, Linkola 2013, pp. 40–41). To give some sort of perspective on the diverse visual materials that geographers have used in their research, a few examples are given in what follows. The visual research materials of geographers include, for instance, young people's drawings on urban environments (Béneker, Sanders, Tani & Taylor, 2010), Finnish children's drawings from the Second World War (Kuusisto-Arponen, 2011), visual catalogues of advertisements (Hilli-Tammilehto & Tani, 1999), tourism brochures imagery (Jokela, 2011), landscape photography (Linkola, 2013), photojournalism (Campbell, 2007), postcards and their political messages (Pritchard & Morgan, 2003; Raento & Brunn, 2008), critical cartography (Kosonen, 2008; Zeigler, 2002), and embodied geopolitics on guided walking tours in Jerusalem (Renkonen, 2014).

In geography education, topics that emphasize the importance of geography as a school subject in a changing, contemporary world have been the focus of attention. According to geography teacher educator Hannele Cantell and her colleagues (2012, p. 297), studies in geography education have dealt with, for example, "children's and young people's everyday life, geographical thinking skills, sustainable development, active citizenship, globalization, e-learning and other innovations in education, media and popular culture as well as environmental observation." With the help of maps and images, geography educators have studied, for instance, children's and young people's everyday life experiences (Hyvärinen & Särkelä, 2015; Tani & Surma-aho, 2012; Välimaa, 2012), place-based education (Hyvärinen, 2012), global education and young

people's worldviews (Cantell, 2011), digital maps (Collins, 2014), visual literacy skills (Hollman, 2014), critical media literacy skills (Oittinen, 2015), imagery of geography textbooks (Behnke, 2016; Sætre, 2009), comics and their use in geography education (Hilander, 2016a; Kleeman, 2006), and photography as a multisensory practice (Pyyry, 2015). In addition, reflection of values in terms of identity, image, mental images, and stereotypes has been strengthened in geography education research (Cantell, Rikkinen & Tani, 2012, p. 299).

Methodology

In the paradigm of semiotics from the 2010s, called “neo-semiotics,” ideas from classical semiotics are borrowed and combined with current ones in order to build new concepts and meta-languages (Hilander, 2016c, p. 6; Tarasti, 2012, p. 316, 2015, p. 24). In this article, essential semiotic concepts by Roland Barthes and Ferdinand de Saussure are applied to the interpretation of photographs from a geographical perspective. Ferdinand de Saussure (1857–1913) was a Swiss linguist, and the other founder of semiotics—or semiology as he termed it in the early days. Roland Barthes (1915–1980) was a French literary theorist and semiotician who was deeply inspired by Saussure. Therefore, the semiotic concepts introduced in this article derive from linguistic studies, especially from *Elements of Semiology* by Barthes (1977a).

Just as *Elements of Semiology*, this article and the smartphone model is divided into four parts, respectively, according to the following semiotic concepts: (1) syntagma and paradigm, (2) language and speech, (3) signifier and signified, and (4) denotation and connotation. These semiotic concepts are mirrored by visual methodologies in building a neo-Barthesian framework for the smartphone model. The four parts of the smartphone model are introduced in Table 1, alongside the geographical aspects of the interpretation of photographs they stand for. In addition, the photographs taken in Taupo, New Zealand (2013) and in New York City, United States (2008) are indicated in Table 1. These two photographs are used to illuminate the semiotic concepts developed by Barthes. That is, the photograph taken in New Zealand is especially used to illuminate the concept of “syntagma and paradigm” and the photograph taken in New York City the concept of “language and speech.” These photographs are used as they are taken during the author's own field trips to New Zealand and to New York City, and because they succeed in demonstrating Barthes's theoretical concepts rather well. The fact that both photographs depict urban landscape is unplanned. The photographs are presented later in this article and the smartphone model in the picture will be presented in the next section.

TABLE 1.

Table 1 shows Barthes's semiotic concepts and the geographical aspects they stand for in the smartphone model. In the last column, the location and date (i.e., month and year) of the two photographs used to illuminate the smartphone model are listed.

Barthes's semiotic concepts	Geographical aspects	Smartphone model parts	Exemplary photographs
Syntagma and paradigm	Visual elements	The screen	New Zealand 10/2013 Figure 2
Language and speech	Textual elements	The brand name	New York City 7/2008 Figure 4
Signifier and signified	Framing of the photograph	The lens	Same as Figures 2 and 4
Denotation and connotation	Application of geographical knowledge	The start button	Same as Figures 2 and 4

In addition, a small empirical data-set was collected for the photograph taken in Taupo, New Zealand (2013). Altogether forty kindergarten student teachers, class student teachers, and special education student teachers at the University of Helsinki, Faculty of Educational Sciences answered two questions concerning the photograph in September 2017. While the photo (see, Figure 2) was shown to the student teachers, they were asked where they think the photograph has been taken (N=40) and to name the most interesting element in the photo (N=37). The results of these questions are presented in the section where “denotation and connotation” are explained, as well. Next, the overall picture of the smartphone model is presented after which its parts are explored more in depth.

Smartphone model for the interpretation of photographs in geography education

In addition to Rose's (2012) sites and modalities, the smartphone model introduces different aspects from which a photograph and its geographical content can be interpreted. In Figure 1, the smartphone model and its parts are introduced. The model is in the shape of a smartphone because it is the medium young people use to take most of their photographs with nowadays (Sintonen, Kynäslähti & Kairavuori, 2015). The first step according to the model is to consider the *visual elements* shown in the photograph. In the model, the first step is parallel to the smartphone's screen because that is literally the place where young people look at their photos. The second step is to consider all the *textual elements*, or linguistic messages, there are in the photograph and how they affect the meaning-making processes. In the model, the brand name of the smartphone reminds one of the fact that textual elements of photos are also to be taken into account. The third step is to consider what sorts of visual and textual elements might

have been *framed out of the photograph*; that is, the question is what is not shown in the photograph. In the model, the lens is to remind of the fact that a photo always reveals only a part of the landscape it attempts to depict (Hilander, 2016c, p. 3); and, it is in looking through the lens that the smartphone user is to decide which elements to include and which ones to exclude from the photograph being taken. When the visual, textual, and “invisible” elements of the photo have been analyzed, the fourth step is to consider what sort of *geographical knowledge* that the students possess can be applied to the interpretation of the photograph. In the model, the start button marks the application of geographical knowledge, as well as mental images of particular geographical phenomena, because a photo is not taken without pushing the start button nor is a photograph interpreted without an interpreter, such as a geography student. Next, each of the four parts, or steps, of the smartphone model will be elaborated in more detail.

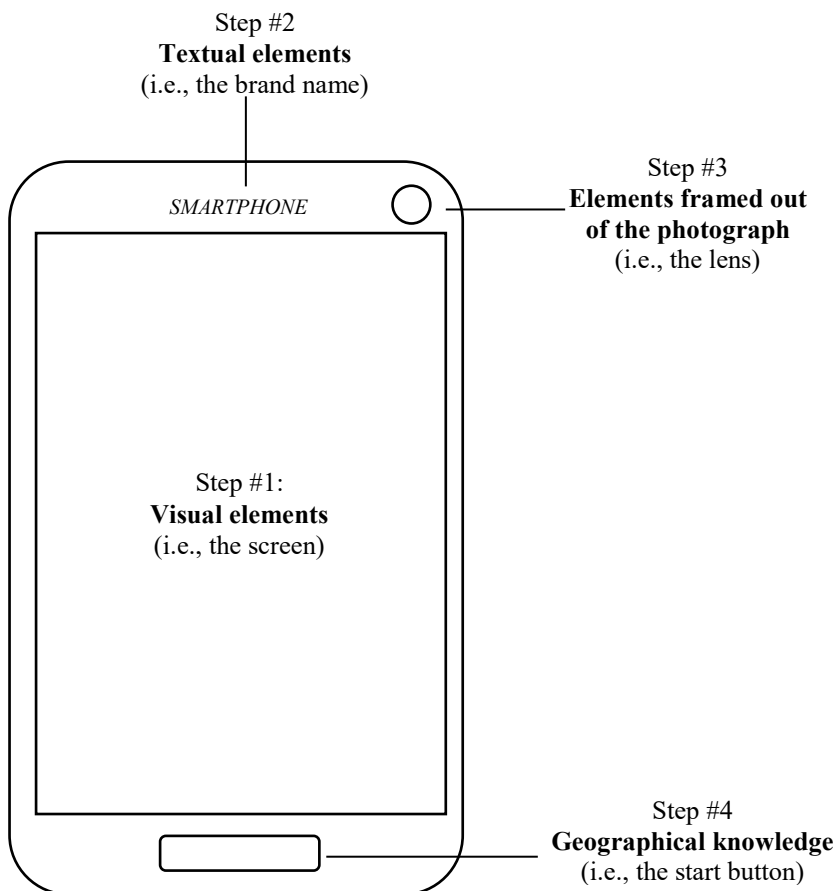


FIGURE 1.

A smartphone model for the interpretation of photographs in geography education.

The screen: What sorts of visual elements are there in the photograph?

The first step of the smartphone model is to pay attention to the visual elements and details of which the photo consists. In semiotics, the combination of these elements and details (i.e., signifiers) is called *syntagma*. Therefore, the whole photo seen in Figure 2 is a syntagma. That is, the syntagma of Figure 2 consists, among other things, in the airplane, McDonald's, palm trees, cars, traffic sign, people, the sky and the road.



FIGURE 2.

Photograph taken in Taupo, New Zealand (Markus Hilander 10/2013). The traffic sign in the middle of the photograph works as a “geographical hint” from which it can be reasoned that the photo is taken in a country with left-hand traffic.

For Saussure, meaning arises from differences between signs as he has stated that “in the language there are only differences” (Barthes 1977a, p. 21). These differences are of two kinds: *syntagmatic* and *paradigmatic*. By syntagma, Saussure means the combination of signs that, in a verbal text, has space as a support; that is, in the articulated language, two words (e.g., “construction area”; see, Figure 4) cannot be pronounced at the same time. And, in visual text, two elements in the same photograph cannot be watched at the same time. Paradigm, on the other hand, is about associations; that is, elements that have something in common are associated together and, thus, they form groups within which various relationships can be found (Barthes, 1997a, pp. 58–59). One practical example of paradigm is the word “car” (see, Figure 2). In order to write the word “car,” one has to choose the letters required for the word from the alphabet; this is called the “paradigmatic selection.” A sentence in which the word car is used—such as, “the car is parked on the street”—is, in turn, a syntagma.

In visual semiotics, paradigmatic selection happens when, for instance, the photographer is planning to take a photo and choosing which elements to include and which ones to exclude from the photograph-to-be. For example, in Figure 2, a paradigmatic selection has been made to show (a) cars in the photograph. Instead of cars, the photo could have been taken of (a') trucks or (a'') bicycles; the connective, or associative, factor here is that they all are vehicles. As stated above, the whole photo in Figure 2 is a syntagma; that is, the syntagma is made out of the (a) cars, (b) road, and (c) the sky, among other things (Figure 3).

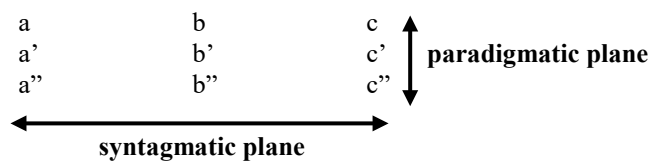


FIGURE 3.

Syntagma and paradigm (adapted and modified from Barthes, 1977a, p. 67).

Paradigm has been referred to with different names, depending on the semiotician using the concept. Barthes (1977a, p. 59) refers to paradigm as a “system,” or a “systematic plane,” in *Elements of Semiology*. Saussure, on the other hand, called it an “associative plane.” However, it was the Russian semiotician Roman Jakobson, who established the name “paradigmatic plane.” In this article, “system” is only used in the Abstract alongside syntagma (i.e., “syntagma and system”); otherwise, “paradigm” is used because it is more descriptive in visual semiotics.

With ready-made photographs, the significant elements constituting the syntagma can be analyzed by means of a “commutation test” (see, Hilander, 2016a, pp. 77–79). In practice, the commutation test is executed by artificially substituting one element (i.e., signifier) for another in the photograph and observing whether this change modifies the plane of content (i.e., signified) (Barthes, 1977a, p. 65; see also, Hilander, 2016b, pp. 77–78). Barthes (1977a, p. 61) advises that, when confronted with a new sign, one can start the analysis with a few paradigmatic elements before studying the whole syntagma. However, it is rather difficult, according to Barthes (1977a, p. 64), to analyze the syntagmatic plane of iconic signs—such as paintings, which resemble their objects but are not in indexical relation to them—because they are rather difficult to divide into paradigmatic units. Therefore, iconic signs are almost always duplicated by articulated speech, such as the caption of a photograph (Barthes, 1977a, p. 64). However, semioticians are still debating whether photographs are iconic or indexical sign systems; although, Barthes had long before acknowledged the mixed sign of the photograph as an index plus an icon (Krauss, 2011, p. 189).

In the context of geography, the significant units of a photograph can work as *geographical hints* (Hilander, 2016b, 2016c). In Figure 2, the traffic sign with an arrow in the middle of the photograph is a good example of a geographical hint. That is, with the help of this visual detail, it can be reasoned that the photograph is taken in a country

with left-hand traffic. As a result, the number of potential locations where the photograph might have been taken is narrowed down.

Let us make another example of the commutation test with the help of the traffic sign in Figure 2. As stated above, if the photo depicted (a') trucks or (a'') bicycles instead of (a) the cars, these substitutions would not necessarily affect the meaning of the photo. However, if the traffic sign was substituted with another sign—for instance, with an arrow pointing to the right—by a commutation test, this would change the syntagma and, therefore, affect the geographic meaning of the photo. When playing with photos geographically by using the commutation test, the visual literacy skills of geography students are enhanced. At the same time, the commutation test encourages the students to come up with alternative readings for the photo and to consider how different people might interpret the same image (Hilander, 2016a, p. 79). In the next section, the second step of the smartphone model with its textual elements is presented.

The brand name: What sorts of textual elements are there in the photograph?

Although images and visual elements, such as the traffic sign in Figure 2, can signify, they cannot always do so autonomously. As stated in the previous section, the meaning of iconic signs (e.g., paintings)—and also of indexical signs (e.g., photographs)—is usually confirmed by being duplicated in a linguistic message (Barthes, 1977a, p. 10). This message can occur, for example, as the caption of the image or be included in the actual photo. The written message provides the link between the photo and its context; therefore, the written text helps the reader to identify the meaning of the photograph.

For example, in Figure 4, there is a construction area and a few skyscrapers behind it. The construction area looks like any other construction area; that is, the photograph could almost be taken in any metropolitan area in the world. When looking at the photo for the first time, the most captivating element might be the fence through which the photo has been taken. To understand what the photo depicts, the viewer needs to take into consideration the textual element in the lower right-hand corner; that is, the letters “WTC” which stands for “World Trade Center.” As the traffic sign in Figure 2, these three letters work as a geographical hint regarding the location as to where the photo has been taken, that is, Manhattan, New York City. The photo depicts the Ground Zero construction area in 2008, where the One World Trade Center (also known as the Freedom Tower) was completed later in 2014. Therefore, the written message provides the context for the photo; that is, the photo does not depict just any construction area, but the one at the Ground Zero site. Thus, the value of geolocative information has the potential to alter the ways in which the viewer understands the photo (Hilander, 2016b, p. 78).

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FIGURE 4.

Photograph taken in New York City, United States (Markus Hilander 7/2008). The letters “WTC” in the lower right-hand corner can be used for “anchoring” the photo to the Ground Zero site in Manhattan.

In his essay *Rhetoric of the image*, Barthes (1977b, pp. 32–51) calls the phenomenon described above as *anchorage*. Anchorage occurs when a text is used to focus on one of the multiple meanings that a photo possesses, or at least to direct the viewer through the maze of possible meanings in some way (McCabe, 2009). According to Barthes (1977b, p. 40), “the text directs the reader through the signifieds of the image, causing him to avoid some and receive others ... it remote-controls him towards a meaning chosen in advance.” The textual elements answer the question: “What is it?” Therefore, textual elements help to “identify purely and simply the elements of the scene and the scene itself” (Barthes, 1977b, p. 39). That is why anchorage is the most frequent function of the linguistic message (Barthes, 1977b, pp. 40–41).

Nonetheless, the creative imagination of the viewer is required to put it all together when interpreting photographs. This, in turn, is called the “process of concretization” by Paul Cobley and Litza Jansz (2010). When anchorage refers to the linguistic messages, concretization refers to all the knowledge and life experience that the viewer has and that is used to interpret photographs. The idea of the process of concretization can be used to understand the concepts of “language and speech” in *Elements of Semiology*. Even though Barthes (1997a, pp. 13–15) is applying these concepts to forms of communication, the substance of which is not verbal, he keeps the terms “language” and “speech” as an echo of Saussure’s “*langue*” and “*parole*.” By “language” Barthes refers to the grammar, rules, or institutional norms that enable people to talk, and by “speech” he means the individual way of talking, for instance, softly or loudly. In the first case, the focus is on general and universal sign systems, and in the latter case the focus is on individual ways of expressing personal thoughts and interpretations. These

concepts are then applied, for instance, to the sign systems of clothing, food, vehicles, and furniture in *Elements of Semiology*.

In the context of visual semiotics and geography education, pictures and photographs in, for instance, geography textbooks can be understood as “language” and the personal ways of interpreting them as “speech” (i.e., the process of concretization). In other words, the letters “WTC” in Figure 4 can be taken as part of the “language,” while the knowledge the students possess on the event of 9/11 concerns the “speech.” Depending on the life experiences and geographical knowledge the students have gained, they might interpret the pictures differently. Furthermore, the student’s way of interpreting photos in geography textbooks might differ from that of the geography teacher (Hilander, 2016c, p. 3). The question here is about the individual act of selection and actualization of the photo and its meanings. In addition, the geolocative information provided by the “WTC” allows students to consider questions, such as: what might it have been like on the World Trade Center area during the 9/11 event; what sort of impact has the terrorist attack had on local people’s lives and also on global politics, or what would it be like to visit the area almost twenty years after the event (Hilander, 2012, p. 79). Now that the visual and textual elements of photographs have been elaborated, the third step of the smartphone model is to pay attention to elements, or signifiers, that the photo does not show.

The lens: What sorts of elements have been framed out of the photograph?

In this section, visual elements are understood as “signifiers.” Therefore, let us begin by studying what is meant by signifier and signified. For Saussure, the sign is the union of a signifier and a signified; both, not just the signifier but also the signified, being signs among others (Barthes, 1977a, pp. 38–39). For Barthes, the signifier is always *material*; for instance, it can be sound-images, objects, or images, such as Figure 4 of the Ground Zero site. The signified, on the other hand, is not the actual construction area seen in Figure 4, but a *mental image* of it (Barthes, 1977a, p. 47). Signification (i.e., semiosis) is a process that, firstly, binds the signifier and the signified together, and secondly, produces the sign (Barthes, 1977a, p. 48). In *Elements of Semiology*, Barthes (1977a, pp. 48–50) pursues visualizing the signification process in four different ways, but emphasizes that each one of them are “somewhat clumsy.” What can be briefly said here about Saussure’s model (i.e., signifier/signified, or briefly sr/sd) is that the line between signifier and signified is the meaning itself; essentially, meaning is then a division, with chaos on either side, that produces order (Barthes, 1977a, p. 56).

In Saussure’s linguistics, the relation between signifier and signified is arbitrary because the signified is not the “thing” itself (e.g., the Ground Zero site in Figure 4), but a mental image of the “thing” (e.g., any kind of construction area). Barthes (1997a, pp. 50–51) disagrees because he thinks that being capable of binding the signifier (i.e., the sound-image when somebody pronounces the words “construction area”) and the signified (i.e., the mental image of a construction area) together, one needs studying and training. Therefore, when someone pronounces “construction area,” one does not think, for instance, of an “amusement park.” Thus, the relationship between signifier and

signified cannot be arbitrary but “unmotivated.” To delineate this, Barthes (1997a, p. 51) uses the word “arbitrary” when he means that the relation between signifier and signified is made by a decision, and the word “motivated” when the relation is analogical.

Barthes had it right that, in visual semiotics, the nature of the signifier differs from that of Saussure’s sound-image. This is because, in Figure 4, a concrete and material construction area can be seen, and not just heard, in pronouncing the words “construction area.” Therefore, the signified that one associates with the Ground Zero site seen in Figure 4 can be something more accurate; for instance, it can be “Manhattan,” “Times Square,” “skyscrapers,” or “9/11.” However, if the letters “WTC” had been left out of the frame of the photograph, the viewer could not locate the depicted area in Manhattan. Likewise, in Figure 2, the traffic sign could have been left outside the photo’s frame. These changes in framing would, in turn, alter the signified of the photographs. In addition, without the two geographical hints (i.e., signifiers)—the traffic sign and the letters “WTC”—the geographical reading of Figures 2 and 4 would have been more challenging.

To summarize this section: framing of photographs is one form of paradigmatic selections, which was introduced earlier in this article. Everybody uploading, for instance, a new profile picture on Facebook is to execute paradigmatic selection. For instance, the Facebook user has the power to *manipulate* the angle from which the photo is taken, alter the brightness of the photo, and choose how the photo is framed (Hilander, 2013, p. 2). That is, the photographer has the power to choose which signifiers to include in the photo and which ones to exclude from it. Therefore, it is worth paying attention to the question of what sorts of signifiers might have been framed out of the photo, that is, what the photo does not show. In the next section, the most widely known semiotic concepts in the context of the interpretation of photographs (Seppänen, 2008, p. 182), denotation and connotation, are studied.

The start button: What sort of geographical knowledge can be applied to the photograph?

In the previous section, the concept of signifier was understood as a material element that is either included in a photograph or excluded from it. In this section, the geographical knowledge (see, powerful disciplinary knowledge, e.g., Tani, Cantell & Hilander 2018) being applied to the interpretation of photographs is, instead, understood as a more abstract concept, that of connotation. In *Elements of Semiology*, only six pages are dedicated to the concepts of “denotation and connotation.” The first level of meaning of a photograph is called denotation. The denotative level does not require interpretation, only observation; that is, denotation covers all the elements in the photograph that can be seen and named (Hilander, 2016c, p. 6). Therefore, the airplane, McDonald’s, palm trees, cars, traffic sign, and people are denotations of Figure 2.

Connotation, instead, is a second level of meaning that is built upon the first level of meaning, denotation (Barthes, 1977a, p. 89). Connotation expresses entities that the subject may attach to the photo; that is, ideas and feelings that the subject has

experienced personally and knowledge that the subject has gained through education (see, Hilander, 2016c, p. 6). For instance, if the viewer perceives the airplane in Figure 2 as, for instance, attractive and interesting, and the Ground Zero site in Figure 4 as dangerous and fascinating, we are already talking about connotations. Therefore, connotation consists in all the additional meaning that the viewer attaches and associates with the denotation. As a matter of fact, the geographical myths described earlier in this paper are nothing but established and conventional connotations, shared by the society and culture (see, Hilander, 2012, p. 76). In addition, connotations can be altered with paradigmatic selection; for instance, the landscapes depicted in Figures 2 and 4 would probably appear more dangerous, had the photos been taken at night.

Let me demonstrate two examples of how connotation works as a means of applying geographical knowledge to the processes of the interpretation of photographs. Firstly, as stated in the section on textual elements (i.e., “language and speech”), geography students can interpret the Ground Zero site in Figure 4 in different ways, depending on their life experiences and knowledge about the 9/11 event. In other words, the mental images and knowledge about New York City that students exploit when interpreting Figure 4 are, by nature, connotations.

Secondly, when it comes to Figure 2, the most interesting elements in the photo according to the student teachers (N=37) of University of Helsinki included the airplane, McDonald’s, palm trees, cars, traffic sign, and people (Table 2). With the help of these elements, the student teachers reasoned where the photo was taken; that is, they attached different sorts of connotations to the photo depending on the elements (i.e., signifiers, or denotations) they had observed in the photograph. The countries that the student teachers (N=40) think the photo in Figure 2 has been taken in are listed in Table 2. For instance, one of the student teachers mentioning the cars thought that the photo was taken in Great Britain. Another student reasoned that the photo was taken in Finland, because of the look of the traffic sign. Third one thought that the photo was taken in the United States because of the direction of traffic. Although cars and traffic signs in Finland, Great Britain, and New Zealand might look alike, the third student utilizes some incorrect connotations regarding the United States and the direction of traffic when interpreting Figure 2. That is, the photo cannot be taken in the United States because they have right-hand traffic. Therefore, it is most important to analyze even the smallest of visual details, or geographical hints in photographs, because they might enable the application of geographical knowledge in the interpretation processes. In other words, paying attention to geographical hints can be helpful in revising students’ misconceptions about certain geographical phenomena (cf., refutational text, e.g., Södervik, 2016). Unfortunately, only one student teacher mentioned the traffic sign as the most interesting element in the photo. Geographical hints can lead to interesting geographical questions that foster students’ geographical thinking skills and knowledge.

TABLE 2.

The table shows where the student teachers of the University of Helsinki think the photograph in Figure 2 is taken and what they think is the most interesting visual element in the photograph. The percentages tell the number of students mentioning the elements and countries in question.

	What is the most interesting element in the photograph? (N=37)	Where has the photograph been taken? (N=40)
1.	Airplane (65 %)	United States (55 %)
2.	McDonald's (11 %)	Great Britain (10 %)
3.	Palm trees (11 %)	Germany (10 %)
4.	Cars (5 %)	Spain (8 %)
5.	Traffic sign	Finland (8 %)
6.	Traffic direction	Australia
7.	People	China
8.		Estonia
9.		Europe

The geographical hints in Figures 2 and 4 concern the location where the photos have been taken. The question of “where” is a good example of teaching visual literacy skills from the perspective of geography; that is, when teaching geo-media skills, or *geographical media literacy skills* (Hilander, 2016b, 2016c), to children and young people, it is expected that all of them will learn more or less the same skills, such as interpreting what cities, or places, Figures 2 and 4 depict. However, the use of photographs in geography education does not always have to be about providing one correct answer to the teacher; on the contrary, the emphasis should be put on arguing one’s own interpretation. That is why geographical media literacy skills can also be understood as competences; that is, when enhancing children’s and young people’s *geographical media literacy competences*, they will learn to interpret photographs from a geographically oriented perspective, but they can still exploit their own personal point of view in the interpretation of photographs—as long as they provide sufficient argumentation for their interpretations.

Concluding remarks

“[T]he problem of the twenty-first century is the problem of the image,” according to cultural theorist W. J. T. Mitchell (1994, p. 2). Interestingly, researchers have been debating whether visual texts, such as photographs and paintings, could be interpreted and understood using the same linguistic concepts when reading written texts. In the late 1960s, the major semiotic current was structuralism, which highlighted language as the central example of a semiotic system; that is, it tended to understand all other sorts

of semiotic phenomena, such as logic, pictures, and cultures, in terms of linguistic concepts which were in many cases insufficient for the task (Bungaard & Stjernefelt, 2010, p. 68). Barthes (1977a, p. 11) stated at the time *Elements of Semiology* was published in the 1960s that semiological knowledge could only be a copy of linguistic knowledge, which must be applied to non-linguistic objects.

However, this view has been challenged during the last two decades of research. For instance, Carey Jewitt (2009, p. 14) notes that “[m]ultimodality describes approaches that understand communication and representation to be more than about language, and which attend to the full range of communicational forms people use – image, gesture, gaze, posture, and so on – and the relationships between them.” In the Finnish national core curriculum for basic education (Finnish National Board of Education, 2014), one of the seven transversal competences is namely multiliteracy. In the curriculum, multiliteracy refers to knowledge presented by systems of verbal, visual, auditive, numeric, and kinaesthetic symbols and their combinations (see also, Kress, 2010). According to the Finnish curriculum, multiliteracy stands for the “competence to interpret, produce, and make a value judgement across a variety of different texts, which will help the pupils to understand diverse modes of cultural communication.” In addition, multiliteracy supports the development of critical thinking and learning skills. When combining different sorts of materials and sign systems—such as written and visual texts—it is likely that interconnections between texts will emerge. These scientific, historical, literary, religious, and other ways of referencing are called intertextuality. That is to say, the meanings of one image or text depend not only on that one image or text, but also on the meanings carried by the other images and texts (Rose, 2012, p. 191).

When it comes to semiotics, criticism is also directed towards its theoretical terminology. For instance, Gillian Rose (2012, pp. 144–145) argues that semiotics “tends to invent new terminology for its own sake,” and sometimes new terms (i.e., neologism) can be confusing and even unnecessary. It can be difficult to apply semiological concepts to one’s research as each one of the terms comes with substantial theoretical baggage (Rose, 2012, p. 109). When it comes to the interpretation of photographs, Rose (2012, p. 72) notes that semiological studies focus on the site of the image itself and little attention is paid to the site of audiencing and social modality. Because semiological studies prefers detailed readings of individual images, it raises questions about the representativeness and replicability of its analyses. In the context of this paper, it can, for instance, be discussed what sort of extended comprehension the concept of syntagma contributes to geography educators’ understanding of visual materials.

This paper contributes to the philosophical and methodological discussions of signification conceived in the 2010s (Tarasti, 2012, p. 316). The Finnish semiotician Professor Eero Tarasti (2015, p. 24) states that “neo-semiotics never considers only the text but all its conditions ... its process of becoming a text.” In this article, the processes of the interpretation of photographs have been approached with a smartphone model, based on a geographical reading of *Elements of Semiology* by Roland Barthes (1997a). This neo-Barthesian framework offers one possible ground for a visual model within

the discipline of geography; namely, for the interpretation of photographs in geography education. However, the smartphone model introduced here is open for development; that is, questions such as what sorts of elements could be added to the model (e.g., what is the role of the volume button), which are the most important elements in the model, and which parts could be removed from the model, are to be discussed.

Consequently, the aim of this article has been interpreting photographs from a geographical point of view, following Roland Barthes (1997a). In the first step of the smartphone model, students are to pay attention to the *visual elements* and especially to the geographical hints that photographs *re-present*. Using the geographical hints, geography students can locate the photograph on the globe. In the smartphone model, the screen itself denotes the first step in the smartphone model as people tend to look at photos on their screen. After the visual elements and geographical details have been analyzed, the second step covers the *textual elements* in photos. These linguistic messages can also be used to anchor the photo on the globe. In the model, the brand name itself is used to remind one of the importance of textual elements. When the visible elements, both visual and textual, have been analyzed, the students should think of what the photo does not show. Therefore, the third step of the smartphone model emphasizes *elements framed out of the photograph*. This fosters young people's critical thinking skills in geography as the surroundings of the photo might differ from the landscape shown in the actual photograph. In the model, the lens signifies the third step as the photo is framed using the lens.

With the help of the former steps, where students have been trying to locate the photo on the globe, the fourth step of the smartphone model underlines the students' skills in applying the *geographical knowledge* they possess in the interpretation processes. This is important because earlier studies (e.g., Hilander, 2012, 2016c) show that students do not use their geographical knowledge when interpreting photographs during geography classes as much as they could. On the contrary, they tend to mirror the situations and locations seen in the pictures with their everyday experiences (Pirttilä, 2018). Therefore, it is important to take into account how geographical information is gathered, geographical facts are ordered, and imaginative geographies are created when interpreting photographs. In the smartphone model, the fourth step is depicted as the start button because a photograph is not taken without pushing the start button nor is a photograph interpreted without an interpreter, such as a geography student.

James Crane (2014) argues that cultural *re-presentations* are produced and consumed in historically specific and carefully constructed ways, and many factors combine to frame how meaning and expression are generated. When interpreting photographs from a geographical perspective, students should be trained to look with intention; especially, to find geographical hints with which it is possible to locate the landscape *re-presented* in the photograph. These location-related geographical hints can, for instance, include road signs, public transport signs, and well-known buildings. Geographical hints help students to interpret the geographical content of the photograph and allow them to apply their geographical knowledge into the interpretation processes. When young people are able to locate these sorts of typical and characteristic manifestations of geographical information *re-presented* in photographs, they are acquainted with the skill of

geographical vigilance—or “directed observation,” as Rickie Sanders (2007, p. 181) calls it. In addition, geography students should be encouraged to take into consideration the elements that the photo does not show; this is important, because cutting certain elements out of the photograph (i.e., making paradigmatic selections) is perhaps the easiest way to manipulate the photograph (Hilander, 2016c, p. 22).

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