

# Methods and techniques for linguistic landscape research: About definitions, core issues and technological innovations

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## Abstract

This chapter discusses some issues related to the development of the study of Linguistic Landscapes (LL), with a focus on methods and techniques of data collection and presentation. The chapter has three parts. In the first part, two definitions of this field of study and how these definitions have been used will be discussed, followed by a brief treatment of a more up-to-date definition. The second part of the chapter deals with three issues more specific to LL studies: the research area, the unit of analysis and the use of photographs as data and as a part of publications. The third part deals with the influence of technological developments on the LL field and some of the consequences and challenges of recent innovations for conducting LL research.

## Keywords

Linguistic landscape studies; public space; research methods and techniques; data collection; research area; unit of analysis; photographs; technological innovation

## 1. Introduction

People have not always been surrounded by as many signs, advertisements, texts, images, etc. as they are today. The postcard in Figure 1 shows an image of a street in Landau, probably taken about 100 years ago. In this view we see hardly any signs and, at the time, there were obviously not many textual items to be read in the streets of the city. So, perhaps there was not much linguistic landscape to be studied?



Figure 1: *Postcard of the Ostbahnstrasse in Landau*  
(Source: <http://www.zeno.org> - Contumax GmbH & Co. KG)

However, on closer inspection there is one element that stands out because it carries various posters (see Figure 2a on the left for an enlargement).

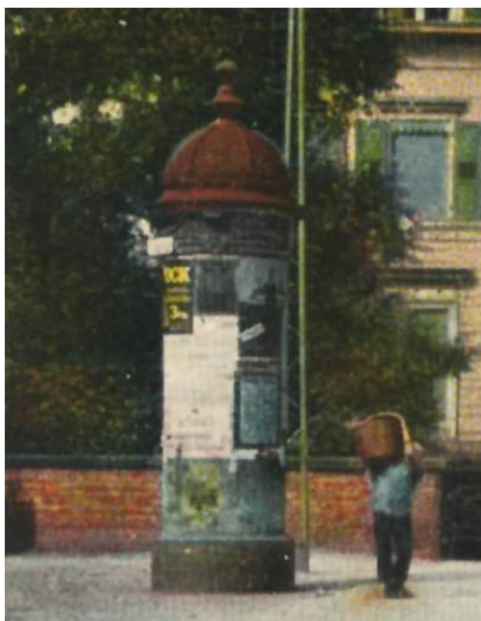


Figure 2a and 2b: *Enlargement of the Litfasssäule in the postcard and to the right a renovated pillar at the same location about 100 years later (April 2016)*

That piece of street furniture is an advertising column, a so-called *Litfasssäule*. They were invented by Ernst Litfass as a centralised place for advertisements, notices and posters. The first 100 columns were placed in Berlin in 1855 and their counterparts, the *Colonne Morris*, were erected a little later in Paris. The overall effect of this technological innovation has been an important change in urban landscapes and they became omnipresent in several European cities during the second half of the nineteenth century. Even today, you can find them in many places around the world (see Figure 2b on the right for a picture of an advertising pillar at the same place in Landau in 2016). These cylindrical outdoor sidewalk structures with a characteristic style are only one of the many types of signage structures that physically support and are part of the linguistic landscape (LL) in our world.

The following outline of the chapter can be given. Many interesting LL studies have been published in the past decade or so, but it is not my aim to provide an overview of methodological developments of LL studies. Instead, I begin in section 2 with “snapshots” of the two most frequently cited definitions of linguistic landscape and propose replacing them with a more current definition. In section 3, I focus on issues specific to LL research linked to its methods of data collection, in particular taking pictures and presenting photographic material. In section 4, I will discuss technological innovations and how they may change the field of LL studies.

## 2. Snapshot of the definitions of linguistic landscape

It is not necessary to provide an overview of the field of LL studies, because summaries are already published in, among others, Backhaus (2007: 12-63), Gorter (2013), Gorter and Cenoz (2017), Huebner (2016), Shohamy (2012), Van Mensel et al. (2016) (see also

Shohamy, this volume). Here, I want to examine in detail the use of two definitions of *linguistic landscape* (section 2.1) and thereafter examine a more recent reformulation (section 2.2).

### 2.1 Two well-known definitions

There is something special about the way in which the concept of linguistic landscape has been defined by several researchers. To understand the development of the field, it may help to focus on its definition. Although earlier studies into linguistic landscapes had been conducted (e.g. Rosenbaum et al. 1977 or Spolsky & Cooper 1991; for a detailed overview, see Backhaus 2007), Landry and Bourhis published an article in 1997 that contained two complementary definitions of linguistic landscape. One I call the ‘short’ version and the other the ‘list’ version. The “short definition” is the opening sentence of the abstract (and does not appear in the body of the article): “Linguistic landscape refers to the visibility and salience of languages on public and commercial signs in a given territory or region” (Landry & Bourhis 1997: 23). At the end of the section called *The concept of linguistic landscape* appears the ‘list definition’: “The language of public road signs, advertising billboards, street names, place names, commercial shop signs, and public signs on government buildings combine to form the linguistic landscape of a given territory, region or urban agglomeration” (Landry & Bourhis 1997: 25). This list definition is appealing because it has common items which we associate with textual signs in public space. On closer inspection, it is like a catalogue of six different sign-types and, of course, it would be easy to add other types of signs in the public space.

LL researchers frequently quote one of these two definitions to introduce their work as contributing to LL studies; according to Google Scholar and Google Books, the list definition is quoted far more often than the short version. <sup>1</sup>

Bruyèl-Olmeda and Juan-Garau (2009: 387) also quote the list definition and then go on to claim that “this definition has been quoted *in most papers* committed to the study of the language(s) displayed around us” [emphasis mine]. It is easy to verify that this cannot be correct: there are indeed many publications that quote the definition but there are far more publications on LL that do not use the quotation. Two book reviewers have also noted a frequent use of the definition and they both write about its supposed over-utilisation. First, in her review of the book edited by Shohamy and Gorter (2009), Zabrodskaja (2010: 273) remarks: “some notions are repeated many times (so that a reader will learn the definition of LL by heart)”. Checking the factual correctness of this statement, it turns out that in 21 chapters the “list definition” is quoted twice in full (by Coulmas and by Huebner) and the “short definition” is mentioned once (by Lanza & Woldemariam). Even if some kind of reference to the Landry and Bourhis (1997) article is made in the other 13 chapters, those authors do not quote either definition. Quoting two different definitions three times in 21 chapters seems hardly enough to qualify it as “repeated many times”.

A few years later, the same reviewer edited a book on LL studies (Laitinen & Zabrodskaja 2015). As a curious coincidence, when Amos (2016a) reviewed that book, he refers again to overuse of the Landry and Bourhis definition: “This includes Landry and Bourhis’ seminal but over-quoted description of the LL (appearing also in Perotto’s chapter and cited elsewhere ad nauseam). It is a shame that the editors apparently overlook this repetition” (Amos 2016a: 436). Checking the full text of the book, this seems somewhat overstated, because the ‘list definition’ is quoted in full in two of the 11 chapters and the short definition not even once. However, perhaps the point both

reviewers wanted to make is that too many authors too often make a reference to the Landry and Bourhis article, as if that paper contained the origins of the study of linguistic landscape. Without a doubt, the article by Landry and Bourhis has been quoted often and has been influential, but some authors tend to attribute the article to having an impact on how LL studies are carried out that it evidently cannot have. For example, Laihonen (2015: 178) claims that “The Landry and Bourhis (1997) approach to LL, i.e. cataloguing language choice in signs, can be criticised for oversimplification”. But how can this be the case when Landry and Bourhis distributed a questionnaire that includes a few questions about linguistic landscape among a sample of francophone students? Similarly, Muth (2015: 206) asserts that “the established methodological approach in linguistic landscape analysis follows Landry and Bourhis (1997: 25)”. Again, how can this be the case if there are few, if any, LL studies that have used a data-collection instrument or a factor analysis similar to Landry and Bourhis? Moreover, to suggest that there is something like *the established approach* disregards the variation in approaches among studies under the LL umbrella. It seems that the article by Landry and Bourhis (1997) deserves re-reading as it contains some important reflections on LL, but its research method has not been followed in the LL field and both the short and the list definition, even if attractive, seem a bit dated. A more current definition seems better suited to determine the essential qualities of the LL field, as I hope to demonstrate in the next section.

## 2.2 A more current definition of Linguistic Landscape studies

Some years ago, we asked the thought-provoking question: “What is LL, ... really?” (Shohamy & Gorter 2009: 1-2). We continued by asking: “Does it refer to language only or to additional things which are present around us: images, sounds, buildings, clothes or even people?” Our answer was: yes, it does. But, we also argued that the “attention to language in the environment, words and images displayed and exposed in public spaces, that is the centre of attention in ... LL”. Now, looking at this *What is LL, ... really?* question again several years later, we might again give the same answer. Of course, the field has developed since then and its definition could be in need of reformulation. Here, I will obtain guidance from a text in *Linguistic Landscape: An international journal* that was first published in 2015. In the aim and scope of the journal we can read that the “field of Linguistic Landscape (LL) attempts to understand the motives, uses, ideologies, language varieties and contestations of multiple forms of ‘languages’ as they are displayed in public spaces”. This provides a broad and workable definition of LL that can replace earlier definitions that may have become worn out and jaded.

The main idea can be visualised by putting “‘languages’ as they are displayed” at the centre of a circle representing the field. The ‘languages’ between quotation marks can imply debates about ‘named languages’ and how they are invented and constructed (Makoni & Pennycook 2007) or that language has to be seen as a wider concept of visual, multimodal components (Shohamy 2015). The *display* of languages is not the exclusive focus, because the field is like a dynamic and expanding circle. Even *public spaces* are no longer its exclusive research domain, as investigators have moved into semi-public or non-public contexts like schools or cyberspace. The question can be asked whether we can (or want) to demarcate the boundaries of the field at all, because it extends in many directions, and its boundaries are continuously crossed by scholars who bring in innovative theoretical and methodological approaches. The ‘languages’ as they are on public display are studied through the lenses of several disciplines,

including sociolinguistics and applied linguistics. The theoretical lenses of various disciplines are brought into the LL field and contribute to its development, and it can work in reverse as well when the application of LL findings influences those disciplines. An example is the plea by Shohamy (2015), who outlines the importance of LL studies to change the field of language policy studies. One finds a multitude of themes and topics in LL publications; some of them are unique and others recurrent. The LL field is diverse and heterogeneity seems to be an inherent feature.

*Linguistic landscape*, or *LL* for short, has undeniably caught on as a term to denote the field, even when other, competing labels have been proposed such as “environmental print” (Huebner 2006), “the decorum of the public life” (Ben-Rafael et al. 2006), or, as I suggested myself, “multilingual cityscape” (Gorter, 2006). Because of its wider connotations, some researchers in the field prefer “semiotic landscape” (Jaworski & Thurlow 2010), which places it somehow within the study of semiotics. This may not be unproblematic because, for example, the urban sociologist Gottdiener (2012: 108) did not contest the term semiotic landscape, but he criticised the introduction of the book by Jaworski and Thurlow rather harshly for a “pedestrian” and “unscholarly” use of semiotics.

The word *landscape* has its historical roots in Dutch, as literally a “tract of land” as well as in English as “a painting depicting a scenery on land” (Gorter 2006: 83). As a way to rethink the concept of landscape, Leeman and Modan (2009) propose that LL researchers should base themselves more on the use of the term in cultural geography, both as a place and a way of seeing (see also Jaworski & Thurlow 2010: 2-4).

The second part of the word ‘land-*scape*’ has given rise to creative ideas, and various forms of *-scape* have been proposed as an alternative to or to be added to LL studies. An almost endless list of possibilities can be found in the LL literature. To include spoken language there is “soundscape” (Scarvaglieri et al. 2013); in education “schoolscape” (Brown 2012); online the linguistic “cyberscape” (Ivkovic & Lotherington 2009); body inscriptions or tattoos form a “skinscape” (Peck & Stroud 2015); an olfactory ethnography leads to a “smellscape” (Pennycook & Otsuji 2015); a “linguandscape” for tourists (Jaworski & Thurlow 2010); “cityscape” as contrasted to “ruralscape” (Muth 2015). Some of the thinking about different types of *-scape* can be traced back to Appadurai (1990) who, in his influential article on globalisation, proposed five scapes as dimensions of global cultural flows (ethnoscapes, mediascapes, technoscapes, ideoscapes, and finanscapes). Perhaps inspiration also comes from the geographer Porteous (1990, cited in Pennycook & Otsuji 2015), who proposed a list of scapes based on the senses (allscapes, dreamscapes, etc.). For the time being, the expression *linguistic landscape* has achieved acceptance and seems to hold against efforts at terminological refinement.

The LL field is varied, complex and rapidly developing and there are shifts between different sets of ideas. Looking through a specific (disciplinary or theoretical) lens at a specific LL theme will be important for the researcher in question. However, each lens will limit the field of view and thus the extent of the observable world that is seen at any given moment. Thus far, I have mentioned disciplinary backgrounds, theoretical approaches, and recurring themes, but not the research methods and techniques, and I want to discuss those in more detail in the next section.

### **3. Methods and techniques of data collection in LL research**

Many LL studies draw on well-known existing research methods and techniques from sociolinguistics, applied linguistics, or other disciplines, so there is no need here for an explanation of well-documented methods and techniques of data collection such as questionnaires, interviews, observations, ethnography or discourse analysis.

In the following three sections I will discuss some issues related to data collection specifically for LL studies. These issues are: the research site or survey area (section 3.1), the survey items or unit of analysis (section 3.2), and the use of photographs as data and in publications (section 3.3), which is perhaps the most specific issue related to LL work.

### *3.1 Research sites*

LL researchers who collect data on the display of language in public space want to go to specific geographic areas, although it could also be cyberspace (Ivkovic & Lotherington 2009) or a combination of both (see section 4). LL researchers may sometimes struggle with the boundaries of the geographic areas to investigate. Some questions are “How to choose?” and “What is the most relevant focal geographical area?” (Hult 2014: 511). One solution LL researchers have found is to follow a (public) transport axis. Tulp (1978), in one of the earliest LL studies, examined the distribution of Dutch and French on advertising billboards along the most prominent tram lines crossing Brussels. Similarly, Backhaus (2007: 65-66) followed the Yamanote train line that runs in a loop through the centre of Tokyo and chose 28 areas next to each station. A recent example is Lai (2013), who studied the LL in four neighbourhoods located along the south–north line of the light rail network MTR in Hong Kong.

Another solution is to focus on one or more (shopping) streets. In LL studies, using streets as a survey area has become a frequent choice. We did our own first LL study in one street (Cenoz & Gorter 2003) based on the example of Rosenbaum et al. (1977), who studied signs in one street in Jerusalem. For our second study, we chose the main shopping street of Donostia-San Sebastián, in the Basque Country, Spain and we compared the signage with a similar street in Leeuwarden-Ljouwert in Friesland, the Netherlands (Cenoz & Gorter 2006) (see Figure 3). The two streets became a kind of *pars pro toto* for the LL of the city, or even the whole region.



Figure 3: *Two shopping streets in Donostia-San Sebastián (left) and Leeuwarden-Ljouwert (right)*

Blackwood and Tufi (2015) consistently selected a 50-metre stretch of a main street to study the LL of a series of cities along the Mediterranean coast in France and Italy. Shopping malls have also featured as survey areas in several studies (e.g. Coluzzi 2016; Trumper-Hecht 2009). However, Pietikäinen et al. (2011) carried out their LL research in villages in the north of Norway, Sweden, Finland and Russia, and observed that the layout is rather different from cities. They wanted to “rethink the ‘main street’ starting point typical of much previous LL research” (Pietikäinen et al. 2011: 284) and selected 20 sites that were central for language activities. The case of Laitinen (2014) is a rather exceptional example because he cycled 630 kilometres on the road between Helsinki and Oulu in Finland to study English on signs. Hult (2014) used the radial highways passing through different neighbourhoods of San Antonio, Texas to capture the LL on video from a car travelling at about 65 mph ( $\pm 105$  km/h).<sup>2</sup>

These examples show that research sites can also be thought of as larger areas than streets. Huebner (2006: 32) already hints at the importance of a neighbourhood as a survey area when he observes in Bangkok “separate and identifiable neighbourhoods, each with its own linguistic culture”. Papen (2012) focused her LL study of gentrification on the area in Berlin known as Helmholtzkiez, where *kiez* is a northern German word for ‘neighbourhood’. Blommaert (2013) carried out his ethnographic LL fieldwork in Antwerp (Belgium) in the neighbourhood where he lives. He provided an account of social change told by in-depth reading of multilingual signage throughout this neighbourhood of Berchem. A number of LL researchers have studied Chinatowns as special neighbourhoods in big cities; examples are the studies in Washington DC (Leeman & Modan 2009; Lou 2007, 2016), Liverpool (Amos 2016b) and in different cities in Belgium and the Netherlands (Wang & Van der Velde 2015).

In a later LL study in Donostia-San Sebastián, we observed differences between neighbourhoods in the use of Basque (Gorter et al. 2012). In a recent article we have suggested that the neighbourhood as LL survey area is an appropriate and suitable level of analysis. We argue that the LL gives a neighbourhood a certain identity and “the ambiance of a neighbourhood can be experienced and seen as a unity, even if geographic, social or language borders are not clearly demarcated” (Gorter & Cenoz 2015: 69). Also, Shohamy (2015: 165) examined the LL of two neighbourhoods as smaller units than the city of Tel Aviv Jaffa, and emphasised that “‘neighborhood identities’ [are] making up a meaningful territorial space and special connection with its people”.

It is, however, not always clear how LL researchers chose their survey areas. Blackwood (2015: 41) is convinced that the choice of survey area remains problematic. He argues that “it is challenging to the point of being unfeasible to survey an entire city or town”, although he hints at possible future technological changes that might make it possible and perhaps he was thinking about “big-data” or Google Street View. Blackwood may be right that the survey area remains an important issue, but it would help if LL researchers started to report more precisely how they chose their survey areas and which decisions they took. For example, Backhaus (2007) described his procedures in great detail, and the arbitrary decisions he had to take. Sometimes part of the problem can be solved by describing the exact location or by including a map as research practice in cases where it is useful. One way is to insert the GPS coordinates of longitude and latitude and another solution is to use a short URL from Google Street View. In our article on translanguaging and linguistic landscapes (Gorter & Cenoz 2015), we inserted the link <http://goo.gl/maps/Oppec> to give readers the possibility to go to the exact location in front of the bookshop in Donostia-San Sebastián (in 2012) that we are describing. Google Street View is a tool that can offer interesting new ways to

conduct LL studies. As Puzey (2015: 398) points out: “Google street view enables users to scout the LL of distant or less accessible areas viewing panoramic images along routes around the world”. Of course, this only applies to the places where it is available and excludes, for example, parts of Germany where Google Street View was stopped for privacy reasons. For his review of the book edited by Blackwood et al. (2016), Troyer (2016: 92) uses Google Maps and Street View to visit all the research sites in the book because the editors state in their Preface that “the reader is invited to journey across Europe, North America, Asia and Africa” (ibid.: xxiii). Troyer even goes as far as to recommend that all future LL work include GPS coordinates.

### 3.2 Signage and survey items

LL researchers take as a point of departure the investigation of the “multiple forms of ‘languages’ as they are displayed”. In many LL studies this implies looking at “signs”, in particular the signs that have written text on them. Backhaus (2007: 4-9; 61) has already reflected on the nature of ‘signs’ and the ‘language on signs’ and he considers what constitutes a ‘unit of analysis’. Investigating signage in one way or the other implies some sort of a selection process. It is possible to do research on only one particular type of sign, e.g. place names (Puzey 2012) or the *LOVE* sculptures (Jaworski 2015). On the other hand, researchers try to collect a representative cross-section of one or more geographic areas, the example of Blackwood and Tufi (2015) in several Mediterranean cities was mentioned above.

An attempt to classify or codify the textual signs usually leads to adopting a definition of the ‘unit of analysis’. According to Blackwood (2015: 41), “*many of those* undertaking quantitative research ... adopt the definition proposed by Backhaus (2007: 66) ‘any piece of text within a spatially definable frame’”. In a more recent publication (with co-authors), he goes one step further and states, “researchers have *largely settled on* Backhaus’s designation” (Van Mensel et al. 2016: 439) [my emphasis]. As an alternative, these authors also refer to our work, a publication in which we decided on another unit of analysis after considering some difficulties and arbitrary decisions in terms of “the larger whole of the establishment as the unit of analysis” (Cenoz & Gorter 2006: 71). We reasoned that some texts are placed by the same company and thus form an assemblage which belongs together. It seems that researchers still struggle with these issues (e.g. Hepford 2015; Neves 2016). It may be true that the ‘solution’ of the unit as a “text within a (...) frame” has been chosen more frequently, but several LL researchers, among those Vandenbroucke, opt for “the establishment (i.e. façade of a shop or house) and not the individual sign” (Vandenbroucke 2015: 6). A problem with “text within a (...) frame” is repetition, because, for example, a shop may have its name repeated numerous times on its front. In quantifying all those occurrences, just one or two shops can skew results in one direction. Another problem may be that it leads to large numbers of signs. Laitinen (2014), for example, used Backhaus’s definition of a sign as a guideline, but he collected such an enormous amount of material containing English (on his long trip, see section 3.1) that he decided to present only “selected observations and impressions” (Laitinen 2014: 60).

Another issue related to the unit of analysis is whether signs are fixed or not. Backhaus (2007: 67) only considered signs fixed on a carrier, whereas I already asked then, “are texts on moving objects such as buses or cars to be included?” (Gorter 2006: 3) (although for convenience sake we left them out of our sample). Other LL researchers, such as Sebba (2010), have argued for the inclusion of non-fixed mobile signs such as newspapers, T-shirts, banknotes or bus tickets. The advice was followed,



for example, by Dunlevy (2012: 4) and Moriarty (2014: 468; 2015: 203), who both decided to include non-stationary signs. However, none of those authors mention the ever-changing texts included on digital screens of video displays, which today make up a substantial part of urban landscapes (see section 4). In another publication, we pointed out that when defining the ‘unit of analysis’ one can move from the smallest individual sign to the level of an establishment, and, following Ben-Rafael et al. (2006: 8), to the LL as a larger unit, a *Gestalt*. There we proposed taking an even wider perspective and suggested “an approach in which the unit of analysis becomes ‘a landscape’ as it can be seen in a single view” (Marten et al. 2012: 5). This is somehow what we tried to apply in our publication on translanguaging and linguistic landscapes (Gorter & Cenoz 2015).

### 3.3 Photographs as LL data

One of the distinguishing traits of LL studies is the use of photographic material to analyse signage. Taking photographs of signs as part of the data collection process has become a research technique that is characteristic of many LL studies, and LL publications often include photographs. I want to briefly discuss three elements related to the use of photographs: first, the LL researcher as photographer; second, the LL photo as data or ‘LL genre’; and third, the author and the readers of an academic text featuring pictures.

In Jerusalem, Spolsky and Cooper (1991) included the linguistic landscape in a larger sociolinguistic research project. The opening sentence of the book reads like an introduction to a linguistic landscape study: “Anyone walking the Old City through the Jaffa Gate is immediately struck by the multiliteracy proclaimed by the signs” (1991: 1; see Figure 4).



Figure 4: *Multiliteracy in signs at Jaffa Gate in Jerusalem (detail)*

Spolsky describes in uncomplicated words how he carried out his data collection: “My curiosity piqued by these signs, I set off with my camera to record as many as I could (Spolsky & Cooper 1991: 8). He recorded over 100 signs on analogue film rolls. In a long table he presents a full list of all photographs, including the languages on each sign and the material of the signs. That last piece of information shows that he already understood the importance of the materiality of the signs (cf. Aronin & Ó Laoire 2012; Cook 2015).

The photographer— as far as this fact is reported— is usually the researcher, unless the help of an assistant or student is mentioned. The following question then arises: are LL researchers sufficiently skilled as photographers? Puzey (2015: 398) comments that the cameras in mobile phones today are “the key piece of equipment”, so that “capturing of large amounts of LL materials can be a relatively straightforward matter”. LL photographs are not an artistic but a technical form of photography, although there is of course a difference between a ‘snapshot’ and a ‘professional photograph’. What I see published in LL studies, which is thus *after* some selection has taken place, can many times be characterised as amateurish snapshot photography. It is hard to understand why more effort does not go into presenting better-quality photographs. Perhaps this is also the reason why Nash (2016: 383) was critical when he quoted me saying: “taking photos of the LL requires hardly any effort and poses no particular difficulties (Gorter, 2012: 9)”, and he argued, “Gorter overlooks the required skill and astuteness demanded of an LL fieldworker”. Still, I agree with Puzey and remain convinced that taking a picture does not require a lot of training, especially not when it is a photo of a fixed sign, and fixed signs are still predominant in the genre of LL photographs. Of course, LL researchers have to use common sense and accept some simple advice about the way they shoot: “take your time”, “frame the sign”, “focus”, “pay attention to the light” and “check the picture immediately afterwards”. Such simple rules of thumb do not ask for sophisticated skills and if needed, software is increasingly capable of making corrections afterwards. Technological advancements also make it less of an issue because digital cameras, also those included in phones, can take pictures with a high resolution. Although of course, afterwards the editing of photographs brings up issues of what is permissible: some cropping or colour adjustment may be acceptable or even recommended, but of course not photo-shopping of complete new signs. Nash (2016) does have a point though, because the published pictures of LL researchers could be improved considerably from a technical-reproduction point of view. For example, photographs of signs on shop windows with a reflection of the LL-photographer-author can be avoided. Researchers also have to consider issues such as the context of the signage (How much of the surrounding area do you include?) or the angle under which you take the photograph (Is the sign in the centre of the photo or not?). Kallen et al. (2016) also discuss some of these issues.

Pictures collected during fieldwork are primarily used as data for interpretation and analysis. Usually, authors report how many signs they have photographed or how many pictures they have taken. They may also report on how they coded or interpreted what can be seen in the image, in particular characteristics of textual elements. There are some methodological issues of how to analyse photographs of signs related to ‘language’, text, colour, material, placement, surroundings, etc. But in a general sense, photographs are like any other data source and sufficient details about procedures should be reported similar to using observations, interviews or questionnaires as data.

Most pictures in LL work can be recognised as belonging to a kind of ‘LL genre’ because they depict a shop window, a poster, a street sign, etc. Pictures of such types of signage are the most frequent. Those signs usually have just one word, or a few words on them, but typically less than ten, although exceptionally longer texts are presented. Considerations of legibility can be important for data presentation: How much do you see? Can the points of interest on the object (often a sign) be seen well? Can the language items be read? Is there a clear centre of interest? In general, LL as a genre of photography in LL publications I find aesthetically by and large boring, but then probably those photographs of signs should not be looked at as a genre for its aesthetic qualities, but rather as a form of technical photography, as there is for other fields such as architecture or biology.

The ‘quality’ of an image is a rather subjective element, but in our case ‘image quality’ refers more specifically to how free the image is from defects such as blur, low readability, etc. From what appears in published work, it seems that some LL authors could still improve on these aspects of image quality. Regularly one finds images in LL publications which are blurred, with words half missing or with linguistic elements that are too small to read. For a reader it is unpleasant when the text states, “In the picture we see an example of”, but in the published photo it is rather impossible to figure it out. Solutions in such cases can be to take a picture again, better compose a picture, or, in other cases, crop an image. Another solution can be to provide a transcript of a text that cannot be read. We did this with a shop window in four languages (Gorter & Cenoz 2015; the Google Street View link above will take the reader there). Transcripts are rather uncommon, although translations of signs in other languages than English are sometimes provided.

LL researchers are often confronted with the issue of how to compose an article or chapter that is going to consist of mainly text and a few selected pictures. The relationship between the text and a figure can be complex. A photo of a sign can be an example of (raw) data, it can have the function to support an argument, but it can also be an illustration or even mere decoration. Sometimes photographs are intended to illustrate a point in the text, but a clear link is missing.

Another reason can be that some publishers do not publish the photographs well or a publisher poses certain limitations which become a barrier for LL authors, such as a restriction on the number of pictures, the maximum size of each image or the placement on the page (only top or bottom). Obviously, within the norms set by the publisher and probably guided by an editor, a selection process takes place where an LL author has to make choices. Sometimes authors report that they could not include a sign “due to space constraints” (e.g. Rubdy 2015: 295).

The following question can be asked: what is the author’s intent to publish this photo and not another? How is a figure used to convey a meaning or a message? How is it related to the content of the publication? Authors usually do not report why certain photographs were selected for inclusion. Sometimes one comes across a remark about the importance of colour for LL photography, but until recently most figures of signs we published in black and white and colour reproduction was an exception. Technological and price developments will help to make it easier to reproduce colour in future publications.

The issue is not only what an author writes and selects to present as figures, but also how the reader interprets the text. We know that texts can be read in different ways and that not all viewers see the same image content, so also in the LL literature it is important to consider in what way the readers construct their own interpretations. Of fundamental importance is the issue of what is there to see when a reader looks at the

picture in the publication? How does a reader look at the image? How can it be read? After reading many LL publications, it seems to me that the inclusion of a few pictures sometimes seems more like an afterthought than a key part of publishing an LL study. The pictures used in LL studies as illustrations sometimes seem like the Cinderella of research instead of its most important data. Of course, some very good LL publications have been published without including pictures.

In conclusion, I would like to advocate that LL researchers take their images more seriously. LL researchers have to give careful attention to their images as data and also as part of their publications. They have to give it some thought, even when photographing signs with a modern mobile phone can be relatively straightforward. They have to consider the conditions in which their images are produced and the effects images can have. If researchers want to develop the LL field further, it is not only about theories, themes, locations or methods, but also about improvement of the technical standards of one of their basic materials, the photographic data as presented in LL publications. After all, as the saying goes, “one picture is worth a thousand words”.

#### **4. Technological innovations and LL studies**

In this section, I will discuss some technological innovations that can have an influence on data collection in LL studies.

In the 1980s when Spolsky took his pictures of signs in Jerusalem, he used a camera with analogue film of 36 images per roll (Spolsky & Cooper 1991). At the time, it was relatively expensive and cumbersome to develop, print and then analyse the photographs. Some years later, in 2002, when we carried out our first LL investigation in Donostia-San Sebastián, we used a small digital camera and we could take an almost limitless number of pictures to cover all the signs (Cenoz & Gorter 2003). After transfer of the files to a desktop computer, they could be coded and analysed on the screen. At the time for us it was obvious that “Recent developments in digital camera technology make the study of the linguistic landscape possible at a relatively low cost” (Gorter 2006: 83). Moving from analogue film to digital recording was an important technological change and one can even observe that the transition from analogue to digital cameras coincides more or less with the explosive growth of the field of LL studies. The introduction around 2003 of mobile phones that include an onboard camera, and the rapid adoption of smartphones after 2007, has further facilitated LL fieldwork. Today, people take pictures with their smartphones all the time and the LL fieldworker does not stand out of the crowd as much as ten or even five years ago.

Over a similar time span, digital screens have become common in the urban landscape. Digital signage is rapidly increasing in outdoor environments, especially since flat-panel LCD displays became affordable as an effective way to communicate and share content with target audiences. For example, the number of large digital billboards doubled in the USA between 2012 and 2016 (Dundas 2016). Screens of all types and sizes have rapidly appeared in about every location, such as shops, bars, public transport, etc. (A collection of early studies was brought together in the special issue on ‘Screens and the social landscape’ by Jewitt & Triggs 2006). To date, most LL studies have focused on static signs, but those digital screens intermingle with fixed signage and are a challenge for studies of ‘language’ in public space.

Another innovation is QR codes, a type of bar code that can be added to almost any publicly displayed sign or any other object, such as flyers, business cards, or even coins. A smartphone camera can scan the image of the QR code to gain access to further

information, for example a website or a video. Although recent developments in recognition software based on artificial intelligence may make the QR codes soon superfluous. Also, website URLs have become omnipresent in the LL and shops increasingly encourage customers to go online while they are shopping. One study found in November 2015 that about 50% of US adults compare prices on a mobile device while in a store (IAB 2015).

Smartphones have spread even faster than digital outdoor advertising and information panels. Numerous people hold their personal screen of a mobile device in their hands at almost every point, which brings them an incessant stream of messages, texts, still images and videos. Digital screens can be observed everywhere and all those screens contain continuously changing ‘language’. The distinction between offline and online worlds is blurring and both are part of the ‘linguistic landscape’ that its users are immersed in. Androutsopoulos (2014) discusses two new areas of sociolinguistic research and he still separates data-collection methods in computer-mediated communication from LLs, but these research areas may become increasingly intermingled.

The following quotation concisely expresses developments about computer technology since the 1950s: “First they were in big rooms, then they sat on desktops, then they sat on our laps, and now they’re in our palms. Next they’ll be on our faces” (Carlson 2012). The author discusses computerised glasses, in particular Google Glass, where a micro-computer at the rim of the glass projects an image superimposed on the surroundings into the eye of its user to display additional information. The project failed miserably; not for technological reasons, but because it lacked social acceptance. It was seen as an elitist expensive gadget and there were concerns about privacy because the glass can unobtrusively take pictures or record video. Once persons wearing the special glasses started to be made fun of as “Glasshole”, the experiment soon terminated. The choice of a catchy insulting word shows the power of language, but most likely it will not mean the end of similar wearable devices.

Another evolution has taken place with VR or Virtual Reality, an existing technology that since 2015 received a boost through the powerful computing possibilities also available in smartphones. By wearing a VR-headset, users are immersed in a three-dimensional artificial world. A simple cardboard viewer with a smartphone is enough to get the basic experience. A major disadvantage is that users are blocked out from their immediate surroundings. Thus far, its success is mainly limited to gaming and training of specialised technical skills. The *li.lab* research group in Innsbruck, Austria is exploring possibilities of LL data collection via a type of “spherical photography” in 360° degrees of signage in urban landscapes (Untertiner et al. 2016).

The most important technological development to influence or to disrupt linguistic landscape studies could be AR or Augmented Reality. With AR, the physical real world becomes supplemented with a computer-generated overlay of reality. An early example, launched in late 2010, is *Word Lens*, which is an augmented reality app for smartphones that recognises printed texts on signs in Spanish and English and translates them instantaneously. In 2015, Word Lens was integrated into the *Google Translate* app, and it now works with dozens of languages. Another example that has been around for some years are digital advertisements projected onto the sideboards of sports games. In the Spanish soccer league, ads are regionalised when Real Madrid plays Barcelona. Fans see different ads on different TV stations and those ads can also be in different languages. This has been taken one step further by using different languages for the same digital advertisement at a major airport, where the language

depends on the majority language at the destination of a departure gate (Jedcaux 2013). These are still indirect and passive examples, where a choice is made according to the expected dominant language of the audience.

Passers-by or potential clients can also more directly interact and become engaged with their digital surroundings and thus they themselves can influence and change the linguistic landscapes of their surroundings. For example, at Times Square in New York it was possible in July 2015 to send a tweet with your own name to a dedicated hashtag and in response some trivia about that name was projected on a huge digital billboard of which the sender in return would receive a photo on their device (Johnson 2015). During the summer of 2016, augmented reality became a worldwide hype through the game *Pokémon Go*. Basically, it is an app that projects images of virtual creatures on the smartphone screen as if they were in the same location. Similar apps exist already that can add tourist information by pointing the phone at a well-known tourist site. Advertising companies want people to directly engage with their commercial messages displayed in public spaces, so that they use their phone to buy the product, share the messages on social media, etc. Their aim is to analyse human behaviour in public spaces such as shopping malls and tourist sites to offer real-time, personalised advertising (Dundas 2016).

The inventor of the advertising pillar, Ernst Litfass, wanted to concentrate official announcements and commercial messages in one recognisable place to go against what he saw as a disturbing littering of posters and notices on the city walls of Berlin. Could he have imagined that one and a half centuries later the digital interactive pillars would become integrated in an urban linguistic landscape overloaded with omnipresent messages? In a high-tech world the advertising pillar (*Litfasssäule*) from the introduction becomes a multilingual messaging structure that interacts with its passers-by. People engage with the linguistic landscape and linguistic landscapes react and change continually.

Already in the 1990s it became clear that “the internet changes everything” (J. Neil Weintraut, cited in Cortese, 1995). In section 3, we pointed to some possibilities for LL research with, for example, Google Street View, like a virtual visit to all places in a study. In this section, we outlined recent technological developments that led to digital signage and the screens of smartphones being everywhere in public space. Through smartphones and other tools, the virtual, the augmented and the real may merge into one. It will be interesting to see how LL researchers are going to deal with such new challenges of customisation, mobility and fluidity.

Of course, LL studies will move forward and researchers are going to widen their ‘field of view’. It implies coming up with creative, innovative ideas and expanding current approaches. At the same time, in order to develop the LL field and to make it stronger, the ‘depth of field’, the part that you see sharply, also needs to be reinforced. LL studies that aim to further develop methods and theories have to be based on an adequate knowledge of former studies and the history of the field. Studies need to be published in ways that make it possible for future researchers to understand the details of such research. Progress in LL work, as in any specialised field, can be achieved by constantly improving one’s interpretations and conclusions, taking into account the ideas and observations of others. This requires that we critically look behind us at previous work and keep paying attention to “‘languages’ as they are displayed in public space” to improve future work.

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1 Google Scholar finds the list definition 252 times and Google Books 140 times, but with substantial overlap. The short definition, in contrast, has only 36 instances and in Google Books 41 results; but there is again overlap (December 2016).

2 A rather curious example is a YouTube video of “A look at the linguistic landscape of Mexico-city” which stretches North-South for 60kms; see <https://www.youtube.com/watch?v=pjwhD5Udclk>