Quantitative 2.0: Towards Variationist Linguistic Landscape Study (VaLLS) and a Standard Canon of LL Variables

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1. Introduction

In recent years, LL research has undergone a turn away from the quantitative survey approaches of what has been described as the 'First Wave' (Woldemariam and Lanza 2015) towards more small-scale, nuanced, qualitative investigations of specifically selected data and their meaning potentials in public spaces. Over this period, studies still attempting large-scale quantitative field surveys have become subject to the criticism that the concomitant methodology entails an undue simplification of their data's character and context, to the point where the approach has been dismissed as merely 'counting signs' (Blackwood 2015). In this chapter we challenge this criticism, arguing that quantitative LL studies, too, are capable of capturing and explicating details regarding the appearance and context of LL signs and their function in public space, by their power to throw into relief general patterns and trends of distribution and co-occurrence. Crucially, the foundation for such analysis is the categorization of LL signs according to a well thought-out matrix of independent variables that break down and record the signs' character and context in terms of a set of features whose patterning can then be explored quantitatively (statistically). Ideally, such a matrix would be applied across LL studies, in order ultimately to facilitate meta-analysis and cross-comparison of findings from a wide variety of locales.

Prior to the methodological turn towards more qualitative approaches (see Barni and Bagna 2015 for an overview; see also Section 2 below for discussion), linguistic landscape research was only beginning to see the emergence of a canonical matrix of variables whose values were to be recorded systematically for each item in a given corpus. As a result of the subsequent concentration on more qualitative examinations, there is currently no agreed method by which large datasets can be analysed, cross-compared, and tested for quantitative patterns and variation, beyond basic impressions and generalized assumptions.

The purpose of this chapter is to launch a redressing of the situation as described. Our goal is to work towards a canonical matrix of variables to be recorded in quantitative LL surveys, and thus towards a standard model for quantitative LL research. In the following, we begin by building a foundation for our argumentation and rationale on the principles of variationist sociolinguistics, a discipline that already successfully harnesses systematic and rigorous quantitative analysis of distributional and co-occurrence patterns in its data for the analysis of language use-in-context. In fact, the affordances of this methodological linkage lead us to frame our venture within a new 'Variationist Linguistic Landscape Study' (VaLLS – see also Soukup 2016). Then, we make so bold as to draft and expound an actual list of variables for a standard model for quantitative LL analysis, based on existing proposals in the literature and drawing on our own research experience with large LL corpora collected in Toulouse, Marseille, Ajaccio and Bastia in France, Liverpool in the UK and Vienna in Austria.[1] We conclude with a brief discussion on how to counter some obvious operational challenges presented by our method, and finally provide an outlook on future perspectives and directions for this line of enquiry.

It is thus our hope to rekindle interest in quantitative LL research methods, to enhance their scientific rigour, and to demonstrate their capacity for highly detailed and rich analyses of patterns of language use, choice and status in multiple contexts and in numerous sociolinguistic

settings. We consider this to be in the interest of pushing the boundaries and venturing into new spaces in the study of LLs, both in terms of the analysis of real-world text objects, and their conception and categorizations within empirical frameworks. Yet, it is important to state that we do not claim to have already devised a definitive canon for all future quantitative LL research. Rather, we wish to put forward the argument that such an undertaking is possible and worthwhile, and to propose a starting point. It is our contention that comparisons and meta-analysis of data across multiple spaces are desirable and useful, and significantly substantiated by data compatibility that allows for further statistical analyses involving such procedures as probability testing, statistical data modelling and inferential analysis, as we are in fact already beginning to see in the field (e.g. Lyons and Rodríguez-Ordóñez 2015).

2. Shifting Field Boundaries

The origins of the quantitative strand of the LL field are commonly attributed to Landry and Bourhis' (1997) study of ethnolinguistic vitality construction through the LL. Later, Backhaus (2007: 12-53) provided detailed evidence of even earlier studies, dating back to the 1970s, which explore sociolinguistic realities through the medium of public writing. Around the time of the field's renaissance and the seminal special issue of the *International Journal of Multilingualism* (Gorter 2006), much LL work was concerned with quantitative data. Each of the four studies collected in the special issue examines the distribution of multilingualism, comparing the visibility of languages in terms of presence on mono- and multilingual items and the public and private status of their assumed authors. The model for authorship followed Landry and Bourhis' (1997) binary classification of official and non-official items, and through the popularization of the parallel terms 'top-down' and 'bottom-up', this approach came to characterize the majority of quantitative LL scholarship in what has become known as the

field's First Wave (for examples see Akindele 2011; Blackwood 2011; Dunlevy 2012; Lanza and Woldemariam 2009; for a comprehensive overview see Gorter 2013).

As early as 2008, however, the empirical-distributive approach to analysing multilingualism faced constructive criticisms. These were debated at the first international LL workshop in Tel Aviv (2008), and many of the arguments were published in the proceeding volume (Shohamy and Gorter 2009). The discussions focussed on a series of proposed problems with the quantitative approach, concerning the identification of sign units and spaces, the agency of sign authorship, language classification and the operational difficulties of collecting survey data. Huebner (2009: 71-2), for example, criticized the generic spatial definitions of signs, which 'afford equal weight to a 3 x 6 inch sign reading "pull" … to a 20 x 40 foot sign proclaiming the name, telephone number, and products of the shop itself'. Earlier, Backhaus (2007: 66) had acknowledged that the classification of large numbers of signs often relies on *ad hoc* decisions, meaning that specific characteristics of signs are ignored if they are not within the classification scheme. Evidently, non-specific classifications make accurate comparisons of complex spaces virtually impossible. Rather than revisiting these questions, however, most LL research turned towards targeted classifications and assessments of smaller numbers of signs, and away from analysing the distribution of these elements across large numbers of units. This turn towards the qualitative now dominates the majority of works in the field. In this strand, discrete elements of a given LL are selected and discussed individually, and are not typically compared with other items in that space or elsewhere in terms of quantitative distributional patterns. In the years that have followed the mostly qualitative approaches in the 2009 volume, further such examples have been provided by Coupland and Garrett (2010), Kallen and Ní Dhonnacha (2010), Marx and Nekula (2015), Muth (2015), Pavlenko (2010), Rasinger (2014), Screti (2015) and Tufi (2013), among others. Throughout all these and more, the emphasis is on specific aspects of a given area, language group, or

society, with examples from the LL used to provide illustrations of these realities *in situ*. A number of studies have transcended both quantitative and qualitative strands of LL research, using empirical surveys to give a general overview of language distribution, but relying on select qualitative data to exemplify the more central discussions of the analysis (Blackwood 2011; Blackwood and Tufi 2015; Kallen 2009; Lou 2010). Much of this and other work has transformed the field beyond the traditional boundaries of linguistics and into alternative areas such as education (Brown, 2012; Cenoz and Gorter, 2008), art (Jaworski 2015; Mor-Sommerfeld and Johnston 2012), memory (Abousnnouga and Machin 2010; Busch 2013) and economics (Peukert 2015). This has also seen an expansion in the classification of 'language' to include semiotic aggregates other than text. The theoretical basis for the incorporation of images, colours and materials with written language was provided by Scollon and Scollon (2003), and driven further by the development of nexus analysis, which incorporates these fundamental semiotic aspects into the investigation of social action and change affected by humans (Pietikäinen et al. 2011; Scollon and Scollon 2004, 2007). Throughout a series of international workshops devoted to the LL since 2008, in Tel Aviv, Siena, Strasbourg, Addis Ababa, Namur, Cape Town, Berkeley, Liverpool and most recently Luxembourg and Bern, the object of focus has varied from the traditional textual sign to public marches and protests (Hanauer 2012; Seals 2012), tattoos and human bodies (Kitis and Milani 2015; Peck and Stroud 2015) space and time (Shohamy and Waksman 2009; Vandenbroucke, 2015), food (Blackwood 2019), soundscapes (Backhaus 2015) and smellscapes (Pennycook and Otsuji 2015).

Alongside this qualitative turn, a number of studies have continued with lines of investigation originally developed by quantitative means. Following Ben-Rafael et al.'s (2006) exploration of a number of social and commercial variables, certain studies have examined LL items in terms of specific contextual characteristics, such as commercial activity or neighbourhoods within a specific city (Ben-Rafael and Ben-Rafael 2012; Bogatto and Hélot

2010; Comajoan and Long 2012). Elsewhere, signs have been grouped in 'frames' relating to various types of social action such as tourism, commerce and immigration (Coupland 2012; Coupland and Garrett 2010; Kallen 2010). Spolsky and Cooper's (1991: 76-81) typography of signs foregrounded similar approaches by Landry and Bourhis (1997) and later Blackwood (2010), who nominate five and nine categories of sign respectively. More recent quantitative research has classified not only the purposes, characteristics and roles of the signs themselves, but also the characteristics of the places in which they are found (Lyons 2015; Peukert 2015).

When compared with the array of variables that are analysable by qualitative assessment, the quantitative schemas of the so-called First Wave appear simplistic and scientifically unsatisfactory. This is because many of these studies have sought to reduce the number of variables in order to make data handling less complex. Blackwood (2010: 296) speaks of limiting the divisions of sign types 'for ease of use', and Spolsky and Cooper (1991: 74) admit to taking a 'parsimonious' approach in order to expedite the coding of data. Within a single study, this permits the setting of workable parameters. However, it does not yield particularly detailed information and comparisons between data points, nor does it generate data that are necessarily compatible across different settings. Accepting the benefits of the level of detail achieved by qualitative models, this chapter seeks to re-launch the quantitative approach by opening a discussion into the similar potential for a standard model in empirical LL survey research, and suggesting some directions in which this might be developed. Notably, we believe that the principles and approach of variationist sociolinguistics are a sound foundation on which to build such a model, for reasons we expand on in Section 3. Sections 4 and 5 operationalize the argument in our proposed model, followed by critical discussion of our undertaking in Section 6.

3. Towards Variationist Linguistic Landscape Study (VaLLS)

Variationist sociolinguistics provides a useful framework for a relaunch of quantitative LL analysis due to its demonstrably successful scheme for exploring and ultimately explicating the 'inevitable' (Fasold 1990: 223) interactions between linguistic and social structures and dynamics on a quantitative basis. This is typically achieved by statistically establishing the distributional patterns that particular variants of linguistic 'variables' ('alternative ways of "saying the same thing"' – Labov 1969: 738) exhibit across various social contexts (see e.g. Chambers 2008; Fasold 1990; Guy 1993; Kiesling 2011; Meyerhoff, Schleef and MacKenzie 2015; Milroy and Gordon 2003; Tagliamonte 2006, 2012; Walker 2010). The evidence thus garnered regarding 'the likelihood of co-occurrence of a variable form and any one of the contextual features in which we are interested' (Bayley 2002: 118) is taken as the basis for detailed descriptive and, ultimately, explanatory statements about the very nature of the relationship between language and social life, and how they mutually shape each other.

Hence, we suggest that the same rationale and procedures be applied to LL field survey data of a quantitative nature, in order to explore the relationship between written language use in public space and its social character, context and contingencies. It follows from this suggestion that quantitative LL research must adhere to the same methodological requirements as variationist sociolinguistic research at large. Three very basic requirements that the variationist approach entails are (1) an objectively imposable, *ex ante* definition of the unit of analysis under study (in quantitative LL research, something typically identified as a 'sign') that is ideally applicable across a wide variety of research settings; (2) a clearly defined and delimited sample within which all occurrences of the unit of analysis are recorded exhaustively as data points (a 'count-all procedure' – Labov 1969); and (3) a list of independent variables that capture the features of each data point and its context of occurrence that are, according to

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respective research hypotheses, likely to have had some bearing on its value/composition (in other words, on a given dependent variable).[2]

The first point, the definition of a unit of analysis, in fact constitutes an issue that has its own long history of discussion in LL research, to which we cannot possibly do justice here for reasons of scope. As we describe in more detail below, we endorse Backhaus' (2007: 66) 'spatially definable frame' model, which we argue sets a reasonable, satisfactory and workable precedent.[3] Whilst Backhaus (2007: 67) excludes texts exhibiting certain, less easily measurable characteristics, an ongoing large-scale LL project in Vienna (see Soukup 2016) takes the spatially definable frame definition to its logical conclusion, where it includes *any* object, even as small as a (permanently fixed) screw, if it bears any written text (lettering) on it. Arguably, this procedure is required for a true count-all collection of items in an LL if surveyed at a comprehensive level.[4]

The second point listed above, regarding the requirement of a count-all procedure, relates to what is perhaps the most basic, axiomatic principle underlying all variationist research, which lends it its scientific rigor, and which facilitates the statistically sound exploration of distributional patterns at the outset: the Principle of Accountability.[5] This principle holds that 'any variable form (a member of a set of alternative ways of "saying the same thing") should be reported with the proportion of cases in which the form did occur in the relevant environment, compared to the total number of cases in which it might have occurred' (Labov 1969: 738; original formatting omitted). Or, as Tagliamonte (2006: 13) puts it, 'you cannot simply study the variant forms that are new, interesting, unusual or non-standard … You must also study the forms with which such features vary in all the contexts in which either of them would have been possible.' Thus, the basic function of the Principle of Accountability is to reduce the likelihood of over- or understating occurrences of certain variants of a variable by way of anecdotal and selective reporting (e.g. due to the allure of their

markedness, exceptionality, non-standardness, or categorical non/fit; see Labov 1969: 737–8).

Under this provision, a standardized and normalized measure of the frequency with which a variant occurs on average in a data sample can be provided, where this frequency is expressed as the proportion (typically, percentage) of occurrences of the particular variant within the entire set of occurring variants of the same linguistic variable (i.e. the set of all attested and relevant alternative ways of 'saying the same thing' – ibid.). It is this very procedure that paves the way for investigating the interaction between the choice of linguistic variants and aspects of social context by means of comparing statistically the different rates of occurrence of particular variants across different contexts. If it is then found that one variant is more likely to occur (i.e. occurs at a higher rate) in one particular type of context (independent variable category) than in another, this provides evidence and a basis for discussion of the meaning of this association — in other words, how it may reflect and/or construe broader social structures and dynamics.

For reasons of feasibility, the application of the Principle of Accountability and the concomitant count-all procedure in comprehensive, quantitative VaLLS surveys will inevitably necessitate the careful selection of a limited survey area in which it is humanly possible to record any and all written signs in all languages, shapes and sizes, for the dataset (as Blackwood (2015: 41) puts it, '[i]t is challenging to the point of being unfeasible to survey an entire city or town.'). It is important to stress, however, that only on the basis of the count-all procedure is the statistical computation and derivation of findings based on distributional patterns of LL signs across different variables scientifically sound. Addressing the issue of systematic survey area selection, Soukup (2016) has proposed to adapt the common variationist strategy of 'hypothesis-driven stratified judgment sampling' for VaLLS (see also Soukup, forthcoming). Survey areas are selected for the composition of their local sign-reading audience following respective research hypotheses. The underlying assumption is that signs are, among other

things, addressed to the local population of passers-by; and in that sense, the make-up of the local population bears an effect on language choice on signs. Thus, survey areas are taken to represent certain audience characteristics, whose bearing on language choice is the target of investigation. For example, the VaLLS project described in Soukup (2016) selects administrative districts in Vienna for data collection in application of the hypothesis that signs geared towards the different local audiences (predominantly young vs. old, predominantly monolingual German vs. multilingual, more/less tourist footfall) will exhibit different amounts of English language use (which is the dependent variable for that study).

Such hypothesis-driven selection of survey areas already introduces a set of independent variables into a study design, namely the ones that capture and operationalize those contextual elements that are the subject of a study's immediate research questions. At the same time, we suggest here that it is in the broader interest of the overall agenda of LL research that each VaLLS project also features a *common* set of variables (contextual features) with which data are coded, in view of facilitating hitherto unfeasible, rigorous meta-analysis and cross-comparison of findings.

Variationist sociolinguistics has demonstrated that such cross-comparison can be a fruitful avenue for the overarching agenda and research interests of a discipline. Studies routinely record and investigate variables such as speakers' socioeconomic status, gender, age, ethnicity, as well as the formality of speaking context. Cross-cultural meta-study of findings has, for example, yielded the insights that local/vernacular linguistic variants are used more by groups of lower socioeconomic status; that vernacular variants are typically used more by men than by women (in situations of stable variation); that a majority/dominant social group is typically seen as using the standard variant; and that shifts from informal to more formal situations are typically concomitant with shifts from vernacular to standard (see Kiesling 2011 for an overview).

Under the outlined provisions, we now proceed to our proposal of a standard list of variable categories that we posit should routinely be included in VaLLS designs for large-scale, comprehensive, quantitative LL field surveys. This standard list captures independent variables of sign context on two levels: a 'physical' level and a 'discourse' level. As described in the following two sections, the physical level refers to aspects of a sign's material appearance and presentation (i.e. where and what the sign is), while the discourse level accounts for the properties of the text itself (i.e. what the sign is *about*), relating to what Landry and Bourhis (1997) originally describe as the symbolic and informational functions of LL items.

On the physical level we propose that it is useful and meaningful for VaLLS projects routinely to record at least basic information about a sign's physical location within a survey area, as well as its rough size and the resources that contributed to its creation. In addition, because it is our contention that it is important to record details not only about the items themselves, but also about the ways in which they relate to the LL through their associated meanings, the discourse level accounts for relationships between languages in the LL and the topics, people and activities with which they are associated. It captures these discourses in terms not only of the signs themselves, but also of the places in which they are found, the authors who write them, and of the functions of the message(s) they convey.

Before we continue, let us briefly step back and explicitly stress the importance of keeping the set of dependent and independent variables featured in a VaLLS design conceptually and analytically separate from the criteria defining the unit of analysis (the 'sign' as such), as forced by the Principle of Accountability. Anything else would, for reasons of undue circularity, compromise the validity and scientific soundness of a subsequent statistical computation of findings, and thus undermine the basic premise of a quantitative variationist LL survey.

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4. Towards a VaLLS variable canon: Physical Level

The rationale for recording information about a sign on the physical level is to capture its location and appearance through physically manifested extra-linguistic factors, in order to explore their potential correlations with language use/choice (i.e. the basic dependent variable in a VaLLS study – see above). In the interest of subsequent cross-comparison of studies, it is evidently necessary to provide the country and city (town, village, etc.) in which the data are recorded. Another aspect to take into consideration is the facilitation of study replication. We suggest that in this interest, also the street name and street numbers be recorded for each data point, as far as this is feasible.[6]

In addition to this basic information, we suggest that interesting research questions can be built around the comparison of data distributions regarding the type of physically manifest ensemble or setting of which a given sign is a part. For this purpose, we propose a set of 10 fundamental independent variable values to describe the 'physical location' of a sign (see Table 1).

Table 1. The 'Physical Location' Variable and Its Values

Physical location	On a wall and clearly pertaining to some kind of establishment unit (e.g. shop, restaurant, institution)
	On a wall but not clearly assignable to such an establishment unit (e.g. signs such as the street number or graffiti)
	On a construction site
	On a memorial
	On some natural growth (e.g. tree, lawn)
	On the pavement (e.g. manhole cover, markings for repair)
	On a pole (pertaining to e.g. a traffic sign or traffic light, street lamp, public transportation stop signal, flagpole, bollard)
	On the roadway (e.g. on a manhole cover, or a painted stop sign)
	On street furniture (e.g. bench, advertising column, bike stand, fire hydrant, phone booth, trash can, fence or railing, public transportation stop shelter, gum dispenser, mailbox, drinking fountain, meter box)

	Other

Further details on the actual *type* of establishment are to be captured in the 'contextual setting' variable on the discourse level, as discussed in Section 5.2 below. On the physical level, the list of values for the location variable is designed to allow simply for the testing of hypotheses regarding e.g. the placement distribution of different types of signs (stickers, graffiti, posters), and potential cross-effects with language use.

In addition to physical location, our proposed canon includes three variables expressing basic dimensions of physical appearance (inspired by the model and logic of the large-scale *Metropolenzeichen* project – see e.g. Cindark and Ziegler 2016; as adapted for the Viennese ELLViA project). The rationale is to capture aspects pertaining to the resources (including expenses) used in the production of a sign, in order to explore trends of language use occurring on signs whose creation required more or less effort, dedication, or financial commitment.

The first appearance variable is 'sign size', recording eyeball measurements relating to the international standard paper sizes.[7] We suggest five values for the variable (see Table 2), as a compromise between feasibility of respective eyeball measurement in the field and information required to pursue hypotheses regarding resource investment.

Table 2. The 'Sign Size' Variable and Its Values

Sign size	Equal in size to or smaller than A6
	Larger than A6 and equal in size to or smaller than A3
	Larger than A3 and equal in size to or smaller than A0 (roughly $1m^2$)
	Between $1m^2$ and $10m^2$ (common size for billboards)
	Larger than $10m^2$

Further aspects regarding the investment of resources in sign production are captured in the variables 'materiality of the sign' and 'application form of the text'. As the names suggest, the

former refers to the material that carries the text, while the latter refers to the manner in which the text is inscribed on this material. One obvious problem here is that the list of possible values for both variables may seem endless. But as our and other research suggests, there appears to be a limited number of recurring categories that cover the majority of the data, so that we propose standardized coding for seven values regarding 'materiality of the sign' (see Table 3) and for five values for 'application form of the text' (see Table 4), plus the value 'other' for any forms not separately listed. Each coding refers only to the dominant materiality/application form of the sign.

Table 3. The 'Materiality of the Sign' Variable and Its Values

Materiality of the sign	Digital display
	Glass
	Metal
	Neon (or similarly illuminated sign, including illuminated lettering)
	Paper
	Sticker (including adhesive letters/decals)
	Wood
	Other

Table 4. The 'Application Form of the Text' Variable and Its Values

Application form of the text	Digital
	Embossed
	Engraved
	Handwritten
	Printed
	Other

It is important to stress that it is by no means our intention nor purpose to suggest an exhaustive list of variables and their values for which to code LL field survey data. Each study has its own research goals and questions to address, which must be reflected and operationalized accordingly in the study design and variable matrix. Rather, we propose that quantitative LL research would greatly benefit from studies that feature the listed variables in addition to or as a subset of their own, so that meta-analysis, a method of knowledge generation successfully

applied in many scientific fields to advance their overarching agenda, becomes possible. This applies to features of physical sign appearance as well as of sign content and function; these will now be addressed in Section 5.

5. Towards a VaLLS variable canon: Discourse Level

Adapting existing terminology, we propose that discourse-level LL phenomena be recorded in three categories, which we operationalize in the variables 'authorship', 'contextual setting' and 'discourse type'. Because the nature of these variables is not as evident as for the physical-level variables discussed above, each of these are expounded in detail below.

5.1. Authorship

As outlined in Section 2, the classic position of quantitative LL studies is to differentiate between two domains of authorship: 'top-down', which indicates official forces exerting political control over a given community (i.e. institutions acting within central and local government structures); and 'bottom-up', which is composed of the rest of the non-official (often referred to as 'private') actors who author signs in the LL.

Whilst some studies have adapted these terms to suit local conditions and specific research interests, empirical efforts have rarely moved beyond this basic dichotomy. We agree that the field's collective research substantiates these two classifications (which we here generically call 'official' and 'private'); but it also justifies a third, which we term as 'unauthorized' (see Table 5).

Table 5: The 'Authorship' Variable and Its Values

Authorship	Official
	Private

Unauthorized

Whilst the 'official' and 'private' categories report on the socio-political power dimension, the 'unauthorized' category concerns an object's license to be situated in the space to begin with – in other words, whether it is permitted or transgressive. As has been explained elsewhere in relation to graffiti (Kallen 2009; Pennycook 2009, 2010), recording unauthorized items captures the actions of individuals who display texts in the LL without the permission of the space owners (or otherwise legitimate managers) – ultimately, what may be considered defilement or vandalism. By contrast, we consider all 'official' and 'private' signs to be authorized.

Our studies (along with others) indicate that it is possible and meaningful to record authorship values at a higher level of detail, capturing more information about the roles and purposes of the authors in question, by marking further divisions within the official dimension (e.g. municipal, regional, or national governmental levels) as well as the private (e.g. individuals, independent businesses, domestic chains, international chains). However, the specifics of such detail may not be relevant or meaningful to all places and research interests; hence, we argue that including them in our canon would quite unnecessarily burden the data coding process for all. Further, as Table 6 illustrates, variable matrices that do feature sub-categories may easily be up-scaled to the general standard categories for the purposes of cross-study comparison. By way of example, Table 6 matches our tripartite proposal for the 'authorship' variable with the more detailed scheme applied in the French data (Amos 2017), illustrating how a study may capture a bespoke level of detail whilst implicitly adhering to the wider standard model.

Table 6. 'Authorship' in the Standard Model and How It Subsumes an Alternative, More Detailed Coding Scheme (Amos 2017)

Standard model authorship values	Alternative model authorship values
Official	Municipal
	Regional
	National
	International
Private	Individual
	Independent business
	Domestic chain
	International chain
Unauthorized	Unauthorized

We argue that the kind of data transposition and recoding shown in Table 6 (i.e. subsuming a more detailed classification scheme within a more general one) is a strategy that can be applied with basically *all* variables we nominate for the standard model. This is in fact one of the vital design features of our proposal for a standard model in the first place: not to constitute the *ultima ratio* of coding, but to provide a maximum of common data coding denominators (variables) to ensure the compatibility of datasets for later integration in cross-study meta-analysis, while at the same time preserving ample room for individual research agendas.

5.2. Contextual Setting

The 'contextual setting' variable specifies the type of place or ensemble in which the sign is found, or to which it relates, as rudimentarily recorded by the location variable on the physical level (see Section 4 above). This permits categorization of signs not only as discrete units, but also in the context of their surroundings and their associated discourses. 'Contextual setting' thus provides important meta-data about the roles of certain types of places and groupings in the LL and their relationship(s) with specific objects, authors and languages. This facilitates not only the cross-comparison of signs within their discursive contexts, but also a greater

understanding of the composition of the LL beyond the official/private and authorized/unauthorized dichotomies.

Our definition of the 'contextual setting' variable is extrapolated from Kallen's (2010: 46-55) argument for the LL to be considered as a 'confluence of systems' which operate simultaneously within a given visible space. His typology includes: the civic frame, denoting official or state activity; the marketplace, reserved for commercial communications; portals, which indicate physical and virtual spaces representative of entrances and exits of people and goods; the wall, incorporating notice boards and other sites of mixed public expression; and the detritus zone, which accounts for deliberately discarded texts signalling a lack of authorial intention to contribute meaningfully to the conventional LL. Evidently, Kallen's approach incorporates characteristics relating to both the physical and discourse levels: the wall, for instance, is a frame that is defined spatially, whereas the civic frame is identified according to authorship.

Following Kallen, we, too, contend that it is useful to identify discursive units in the LL that are defined through both semiotic properties and physical space. Contextual settings are thus initially spotted in terms of location on the physical level (e.g. buildings lining a street, shop fronts, parks surrounded by gates, bus stops), but their specification furthermore captures information vital to a discourse-based analysis of the social actions and activities associated with these spaces, and hence of the signs found therein.

Our proposal for the 'contextual setting' variable is to adopt a categorization system that is already definitive in other areas of the investigation of public life: the "International Standard Industrial Classification of All Economic Activities (ISIC)" (United Nations 2008). Issued by the UN Department of Economic and Social Affairs, the ISIC is 'a coherent and consistent classification structure of economic activities based on a set of internationally agreed

concepts, definitions, principles and classification rules' (United Nations 2008: 3); where the term 'activity' is defined as 'the use of inputs (e.g., capital, labor, energy and materials) to produce outputs' (ibid., 13). Crucially for our purposes, the ISIC captures activities regardless of originator (whether enterprises, governments, or private organizations), setting, formality, level of institutionalization, non/market orientation, or even legality (ibid., pp.11). Thus, we argue, this system can be used as a heuristic to sort and describe all kinds of public activity, beyond the strictly 'economic'.

ISIC breaks down activity into 21 'sections' (see Table 7), which can each be subdivided into further 'divisions', 'groups' and 'classes', thus allowing for categorization on four levels.

Table 7. The Top Level 'Sections' of the ISIC Activities Classification

ISIC Section ID	ISIC Section name
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organizations and bodies

Source: United Nations (2008: 43).

Adopting the ISIC activity classification system is beneficial because it offers a comprehensive how-to manual that makes characterization of LL ensembles fairly straightforward and should ensure consistency within and across studies. Signs pertaining to a fitness centre, for example, would be characterized as thematically belonging to section 'R - Arts, entertainment and recreation', division '93 - Sports activities and amusement and recreation activities', group '931 - Sports activities' and class '9311 - Operation of sports facilities'; while signs on a plumber's workshop would be categorized as belonging to section 'F – Construction', division '43 - Specialized construction activities', group '432 - Electrical, plumbing and other construction installation activities', class '4322 - Plumbing, heat and air-conditioning installation'; or signs on a national tax office would be labelled as pertaining to section 'O - Public administration and defence; compulsory social security', the similarly named division '84 - Public administration and defence; compulsory social security', group '841 - Administration of the State and the economic and social policy of the community' and class '8411 - General public administration activities', etc. Analysis can then move up or down in this four-level scheme as required by its individual research concerns; while compatibility of classifications is fully ensured across studies. Researchers may even add another layer of yet finer granularity, while still fitting their data with the standard model, as exemplified in Table 8.

Table 8. The Standard Model's ISIC Classification Level of Activity 'Classes', and How It Might Correspond with an Alternative Study's (here, Amos 2017) More Detailed Coding Scheme

Standard Model (ISIC 'class' level)	Alternative Study
4771 - Retail sale of clothing, footwear and leather articles in specialized stores	Children's clothing shop
4771 - Retail sale of clothing, footwear and leather articles in specialized stores	Adults' clothing shop: men
4771 - Retail sale of clothing, footwear and leather articles in specialized stores	Adults' clothing shop: women
4722 - Retail sale of beverages in specialized stores	Wine shop

4722 - Retail sale of beverages in specialized stores	Beer shop
5510 - Short term accommodation activities	Hotel
5510 - Short term accommodation activities	Bed and Breakfast
5510 - Short term accommodation activities	Youth hostel

Of course, an additional advantage of using the ISIC system is that it makes the integration of all kinds of other data sources (e.g. economic statistics) into LL studies possible, in the interest of additional contextualization and evaluation of findings. As pointed out in the ISIC manual, 'Since the adoption of the original version of ISIC in 1948, the majority of countries around the world have used ISIC as their national activity classification or have developed national classifications derived from ISIC ... Wide use has been made of ISIC, both nationally and internationally, in classifying data according to kind of economic activity in the fields of economic and social statistics, such as for statistics on national accounts, demography of enterprises, employment and others' (United Nations, 2008: iii). A multidisciplinary compilation and analysis of data is thus facilitated that has the potential to transcend the immediate concerns of LL research and reach a much broader community of scholars.

5.3. Discourse type

The third and final variable on the discourse level of our canonical matrix is 'discourse type', a label and conceptualization we adopt and adapt from the large-scale German 'Metropolenzeichen' project (e.g. Cindark and Ziegler 2016; p.c.), where in turn reference is made to a line of thought first expounded by Scollon and Scollon (2003). The general idea of 'discourse types' is to capture, characterize and classify 'the ways in which people engage each other in communication' (as per the respective definitions of 'discourse' in Scollon and Scollon 2004: 4). Based on our own extensive fieldwork and research in France, the UK and Austria, we propose to expand the 'Metropolenzeichen' set of values for the variable 'discourse type'

from six to nine (adding 'political', 'religious' and 'technical jargon'), plus the category 'other' for any cases not thus captured (see Table 8).

Table 9. The 'Discourse Type' Variable and Its Values

Discourse type	Artistic
	Commemorative
	Commercial
	Infrastructural
	Political
	Regulatory
	Religious
	Technical jargon
	Transgressive
	Other

As we have underlined throughout the presentation of our standard model, we do not pretend that the proposed classification of discourse types is the only valid level for analysing LL signs and the language use they contain. Rather, it is intended to address one particular kind of research question, namely concerning the probabilistics of distributional patterns regarding certain kinds of language choice across different contexts of occurrence and use in the LL. Thus, applying the respective variable, one could investigate whether the choice of a particular language is more or less likely to occur on commercial or regulatory signs. At the same time, one could wish to implement a more fine-grained categorization addressing more nuanced questions (What kind of product is being advertised in a commercial sign? What aspect of public life is being regulated?). In the latter case, however, an individual study's coding scheme is ideally set up in a way that establishes clear correspondences between its own particular (sub)categories and the standard model, in the interest of preserving the option of subsequent data re-coding and transposition in a grander scheme of investigation.

6. Towards a Standard Model

The physical- and discourse-level variable matrix as outlined here represents a suggested starting point for developing a common methodology for VaLLS research undertakings, which we posit with the aim of initiating discussions about the potential further exploitation of quantitative field survey data, and its facilitation of scientifically sound statistical comparisons between datasets collected in different times and spaces. In this sense, a standard model should be thought of as a baseline upon which variation and change in different settings can be measured and understood.

As stated throughout, it is clear that the degree of classification granularity discussed here may not be satisfactory for all types of studies, particularly in the face of diverging research goals. Certain investigations, for instance, may identify materiality as a key interest, whilst choosing to neglect other variables such as thematic context or discourse type. Similarly, researchers interested in capturing a breadth of information wider than the ones described here may wish to record more values of each variable than are featured in our system. This is the reason for which we are proposing what we consider a *minimal* scheme whose basic parameters, however, can be expanded and added to at any point, as we illustrate in Tables 6 and 8. In other words, the implementation of a standard model may be facilitated by establishing under-running secondary dimensions, on which specific variables are collapsed into broader categorizations. This would allow participating studies to record data at a level of detail specific to the current goals, whilst simultaneously permitting comparisons on a more fundamental, standard model level, across a broad body of research.

The more or less specific interests of different studies mean that a standard model cannot hope to allow for all possible classifications that future research may find. However, it can provide the basis for a standardized set of fundamental categories, in addition to which more specific variables can be recorded. We argue, therefore, that comparative studies do not require all data to be compatible and transferable; merely that relevant comparisons may be based on data that are recoverable at the fundamental level. It is our intention that this fundamental level (i.e. the 'standard' model) nevertheless include a range of detailed and relevant data fields. Moreover, by cross-comparing aspects of the physical and discourse levels across data recorded in multiple settings and at multiple times, the data can illustrate trends that become more than the sum of their parts as new comparative perspectives emerge.

7. Conclusion

This chapter has provided us with the opportunity to suggest that quantitative LL research may be usefully reconceived within variationist sociolinguistic terms. It is our contention that VaLLS bears important benefits for rigorous data collection and analysis in LL research, since establishing certain standards allows for cross-comparison of otherwise disparate datasets and, ultimately, meta-study conducive to further theorizing. Based on research carried out in multiple settings around the world, we suggest that a standard model be comprised of both physical-level and discourse-level variables, to account for the mixed methods which currently characterize LL study. We have explained these here in terms of a number of variants, the terminology and application of which, we argue, capture the central interests in quantitative LL study.

It is our intention that this chapter serve not only as an overview of ideas relating to this endeavour, but also as a call for further development and contributions from scholars working

across the LL field. At the very least, we hope to launch a discussion of our proposal, ideally leading to further application and testing regarding its usability and informativeness. We propose this because we firmly believe that in the LL enterprise, quantitative study designs and data analyses have their rightful place next to qualitative ones, the two strands ideally coalescing into carefully strategized and rigorously executed mixed methods research. The meanings and functions of language use in public space are multifaceted and multidimensional – it is our contention that the methodological toolkit used to study them must be so as well, in order to capture the most in-depth analysis possible of trends in language choice, use and presentation in the LL.

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[1] Viennese data were collected under the project 'ELLViA – English in the Linguistic Landscape of Vienna, Austria'. This project is financed by the Austrian Science Fund (FWF), project number V394-G23 (for further information, see the project homepage at https://bit.ly/projectellvia - 29 January 2019). The Liverpool data were recorded for a project about ethnolinguistic identity in the city's Chinatown (Amos 2016). The French data were recorded for a project about the visibility and status of the regional languages Corsican and Occitan in the LL (Amos 2017).

[2] In an LL study of multilingualism, a given dependent variable might be language use/language choice. Of course, coding for language choice entails a host of decision-making in its own right. However, in the present chapter, we are primarily focused on the selection and implementation of *independent* variables in a quantitative LL coding scheme. For further discussion and viable models of operationalization of 'language choice' / 'multilingualism' see e.g. Reh (2004), Backhaus (2007) and Cindark and Ziegler (2016).

[3] Dubious cases of spatial (material) delimitation may also be resolved under considerations of layering (i.e. whether items were put up simultaneously as a unit of sorts, or at different times; e.g. graffiti) – although, admittedly, this particular operationalization remains subject to grey areas and *ad hoc* judgment calls.

[4] This, of course, still leaves us with the above-mentioned issue of great size variance across the units of analysis in a data set (see Huebner's (2009) criticism cited above). As explained in Section 4, we suggest that this issue is best addressed by incorporating a respective independent variable in the coding matrix, to be followed up by corresponding hypothesis testing.

[5] The implications of this principle within VaLLS were first expounded in Soukup (2016), on which parts of the following paragraphs are based.

[6] While geo-coding data is possible in this regard, it may not be easily feasible nor equally accurate in all cases and settings. But see the German 'Metropolenzeichen' project (e.g. Cindark and Ziegler 2016) for a large-scale LL survey that implements geo-coding in data collection and analysis.

[7] As specified in ISO 216 (for reference, see the publishing institution's relevant webpage https://www.iso.org/standard/36631.html - 29 January 2019).