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Situating Simultaneity: An initial schematisation of the Lexicogrammatical Rank Scale of British Sign Language

Abstract

A central tenet of systemic functional theory is the rank scale: an ordered representation of the part-whole relationships of units within semiotic systems. Linguists have schematised the rank scales for the lexicogrammars of English, French, Spanish and Chinese, to name a few. However, such schematisation has yet to occur for languages in the visual-spatial modality (i.e., sign languages).

This paper contributes to current literature by establishing a working schematisation of the lexicogrammatical rank scale of British Sign Language (BSL). By taking a glottocentric perspective and with reference to systemic functional theory and BSL data, this work demonstrates that it is possible to create an organised rank scale for a language operating the visual-spatial modality as long as the productive simultaneity found within is accounted for sufficiently. This is enacted through a more detailed elaboration of the morpheme rank, so that higher ranks may be represented accurately.

This study provides the foundations for similar rank scales of semiotic systems operating in the visual-spatial modality to be schematised, while also suggesting areas for further empirical investigation in both systemic functionalism and sign linguistics.

Keywords

British Sign Language; Lexicogrammar; Morpheme; Rank Scale, Simultaneity; Systemic Functional Linguistics; Visual-Spatial Modality

1 - Introduction

In their review of systemic functional descriptions of languages, Mwinlaaru and Xuan (2016) highlight a growing body of literature covering numerous semiotic systems. This body of knowledge is helping to confirm and challenge theoretical assumptions in systemic functionalism, while assisting scholars in working towards a typologically-sound model of describing and analysing languages (Christie, 2004; Halliday, 2009). However, a pattern arises from Mwinlaaru and Xuan (2016), and across other systemic functional descriptions of language (e.g., Halliday and Matthiessen, 2014), that may hinder such a goal: the majority of this work is based on spoken and/or written languages.

Until recently, sign languages – semiotic systems found around the world that operate in the visual-spatial modality – have had little recognition in systemic functional literature, with the exception of Johnston's (1996) preliminary investigations into the metafunctional diversity of Australian Sign Language (Auslan). As such, a vast area of research is yet to be explored concerning the application of systemic functional theory to languages operating in the visual-spatial modality. It is only recently that empirical work into this area has commenced with British Sign Language (BSL; see Rudge, 2018) and in other sign languages (e.g., Flemish Sign Language; Wille et al., 2018).

Before systemic functional descriptions of sign languages may be expanded to the level of detail seen in those of spoken languages (see, *inter alia*, Matthiessen, 1995; Caffarel, 2006; Li, 2007; Teruya, 2007; Lavid, Arús and Zamorano-Mansilla, 2010; Halliday and Matthiessen, 2014), it is necessary to understand and establish the 'fundamentals' of languages in the visual-spatial modality when viewed through a systemic functional lens. One such fundamental aspect concerns the abstracted representation and organisation of the componential nature of the lexicogrammar, otherwise known as the lexicogrammatical rank scale. As suggested above, this has been explored in considerable detail for languages such as English (e.g., Matthiessen, 1995; Halliday and Matthiessen, 2014) but this has yet to be investigated in a sign language such as BSL.

This paper presents a preliminary exploration into BSL from a systemic functional perspective, with the goal of offering a coherent schematisation of its lexicogrammatical rank scale that may be adapted and employed in later studies. Firstly, the notion of the rank scale

is explored in terms of its diachronic development and its use in systemic functionalism, including its application to various languages and at different strata (e.g. lexicogrammatical, discourse semantic, etc.). Secondly, a brief overview of the nature of linguistic production in BSL is presented, focusing predominantly on the differences between fully and partly-lexical signs (Hodge and Johnston, 2014) and commentary on expressive simultaneity and how this affects meaning making. Finally, the BSL lexicogrammatical rank scale is developed in several stages, demonstrating similarities and differences to that which has been schematised for spoken languages. This is performed in as glottocentric a manner as possible (i.e., using data from within the language rather than attempting description via comparison between languages or 'transfer comparison;' see Caffarel, Martin and Matthiessen, 2004; Quiroz, 2018). In particular, the visual-spatial nature of the language results in adaptation of a 'typical' lexicogrammatical rank scale at morpheme rank: a three-way split into manual, non-manual, and spatio-kinetic components is required in order for higher ranks to be fully and accurately represented in BSL.

This paper provides significant impact in the domain of systemic functional linguistics, with a potential for application beyond this theoretical domain. Firstly, it argues that a lexicogrammatical rank scale for a sign language can be reliably schematised, providing opportunities not only for BSL to be explored in greater detail from systemic functional perspectives, but also for other semiotic systems within the visual-spatial modality. Secondly, systemic functionalism has been demonstrated as flexible in its application both within linguistics (as noted above) and beyond (e.g., Kress and van Leeuwen, 2006; Sidoni, Wildfeuer and O'Halloran, 2016). This flexibility is further supported here: a central component of systemic functional theory may be applied to a language in an understudied modality without compromising the integrity of the theory itself, instead expanding and challenging current understanding. Finally, this work provides pathways for exploration concerning the understanding and representation of simultaneous embodied expression (see Martin and Zappavigna, 2019). For instance, BSL is capable of communicating both in a sequential and a simultaneous manner, to the extent that multiple experiential processes can be produced in concatenation and/or at the same time. Indeed, it is possible and common for spoken language users to employ co-speech gesture alongside their speech (see the notion of the 'semiotic repertoire' presented by Kusters et al., 2017) in which two separate modalities (the oral-aural and the visual-spatial) realise related yet distinct meanings, but this has been studied neither in detail from systemic functional perspectives, nor when the simultaneity is

restricted to one modality. This paper therefore opens up this avenue, among others, for future research.

It should be borne in mind that this application of a theoretical framework to the structure a sign language is one of many that could be performed. For instance, other work in the domain of the structure and function of signed languages includes perspectives at the ‘opposite end’ of the formal-functional spectrum, such as Sandler and Lillo-Martin (2006) who employ a predominantly generative approach in their investigation of sign language syntax and clausal structures. Other perspectives are ontologically and epistemologically closer to systemic functionalism. Lepic and Occhino’s (2018) use of Construction Grammar approaches on American Sign Language (ASL), for example, note that “phrasal patterns themselves are typically associated with semantic or pragmatic functions that cannot be attributed to the identity and arrangement of their internal constituents alone” (p.142). Further approaches rework existing positions on sign language structure into more holistic perspectives. These may draw on divisions seen between sign language and gesture, and instead analyse and describe sign languages using a broader notion such as the ‘semiotic repertoire’ (e.g., Ferrara and Hodge, 2018; Kusters at al., 2017).

The work presented here, similarly to the works noted above, adds a novel interpretation of sign language description and analysis that explores the systemic functional theoretical tenet of rank so that later work concerning functional aspects of sign language may build upon it. It is intended to be a complementary addition to the many alternative linguistic perspectives available, rather than appearing superior or subordinate in manner.

2 - Rank in Systemic Functional Linguistics

The development of rank and of the rank scale

Human languages are multidimensional in their nature. When they are viewed from systemic functional perspectives, there are a variety of ways in which they may be abstracted. This includes, for instance, the stratification of the linguistic system (i.e., the 'levels' of language ranging from the phonetic to the discourse semantic), clines of delicacy from general (i.e., system) to specific (i.e., instance), and the notion of rank as an organising principle of linguistic form and function (Berry, 2017). This latter dimension of systemic functional theory forms the focus of this paper and will be expanded on in this section.

'Rank' as a concept in systemic functionalism traces back to Halliday's (1961) foundational work discussing the "fundamental categories of that part of General Linguistic theory which is concerned with how language works at the level of grammar" (p.242). Halliday suggests various organising principles, one of which stipulates that "the units of grammar form a hierarchy that is a taxonomy" (p.251): a ranking of grammatical units. As systemic functionalism developed into its first major iteration (see Taverniers, 2011), Halliday (1961) described the lexicogrammar of English as having five units of expression that could be placed into a hierarchical scale: sentence - clause - group/phrase - word - morpheme.

Three fundamentals about this scale are noted. Firstly, the relationship between each rank is compositional: a sentence is composed of one or more clauses, a clause is composed of one or more groups and/or phrases (e.g. nominal groups, prepositional phrases, etc.), and so on. Secondly, this scale echoes the notion that language is "a patterned activity" (Halliday, 1961, p.250) and that each rank represents the point of departure for choices in meaning-making. While this is not immediately visible on a rank scale itself, it is possible to cross-reference ranks with the specific functions that language has developed to serve in a function-rank matrix (see Table 1 of Halliday, 1973, p.141)[1]. For instance, the ideational system of TRANSITIVITY (i.e., how processes, participants, circumstances, and the relationship between these three are realised) is situated at clause rank, while the interpersonal system of ATTITUDE is at group rank, and the textual system of COLLOCATION is at the word rank. Finally, Halliday (1961) notes the potential for 'rank shift,' or how units at a one rank may operate in the guise of a unit at a rank below. For instance, *the lamp in the corner*

demonstrates how a prepositional phrase (*in the corner*) qualifies a nominal group (*the lamp*) thereby operating "as if it was a word" (Matthiessen, Teruya and Lam, 2010, p.170).

Since Halliday (1961), systemic functional theory has developed and has been applied in multiple contexts (see, e.g., Martin, 2016; Sidoni, Wildfeuer and O'Halloran, 2016; Taverniers, 2011). Nonetheless, 'rank' has remained a constant throughout (although not without criticism; see, e.g., Matthews, 1966, and McGregor, 1991). In more recent literature, its specificity and application has extended substantially. In the fourth iteration of their introduction to functional grammar, Halliday and Matthiessen (2014) detail a fine-tuned lexicogrammatical rank scale of English demonstrating these developments. In contemporary theory, the clause is at the highest rank of the scale, with 'sentence' no longer forming a part of this scale (cf. Peng, 2017, who extends the lexicogrammatical rank scale beyond the clause and into the proposed ranks of 'clause complex,' 'paragraph' and 'text'). Additionally, the compositional nature of the scale is explained via the notion of "exhaustiveness" (p.21): elements in one rank are made up of a whole number of elements in the immediate rank below.[2] The concept of rank shift remains, as does the idea that "units of different rank construe patterns of different kinds" (p.22), and extensions of this organising principle beyond the lexicogrammar are present. For instance, Halliday and Matthiessen provide the rank scale operating at the phonological stratum (tone group – foot – syllable – phoneme). Rose (2007, p.187) similarly identifies a discourse semantic rank scale (genre – stage – phase – message). In short, rank scales present "the stretches of language of different sizes that carry patterns (structures) and choices (systems)" (Berry, 2017, p.49).

Returning the focus on lexicogrammatical concerns, an example of the lexicogrammatical rank scale for English is presented in [Insert Table *1*:

[Insert Table 1 here: "An example of the lexicogrammatical rank scale of English."]

The rank scale in [Insert Table *1* demonstrates 'exhaustiveness' in the relationship between ranks, and may be interpreted as follows: *The books had contained several errors* is a clause simplex (i.e., it is one 'unit' of a clause rather than a combination of clauses or clause complex) whose composition is discernible at lower ranks. At the group/phrase rank, two nominal groups construe the experiential participants of the clause (i.e., the 'things' and/or

phenomena) and surround a verbal group which construes the experiential process (i.e., the relationship) between these nominal groups. The groups are composed of individual words (when understood in the traditional sense; see, e.g., Coates, 1999, on problems surrounding 'word') which are in turn composed of morphemes that, in this instance, include free bases (i.e. 'book,' 'contain' and 'error'), bound roots (i.e. 'ha-'), and bound suffixes (i.e. '-s,' '-d' and '-ed').

Lexicogrammatical rank scales across languages

As rank functions as one of the core dimensions of systemic functionalism, the description and analysis of a language though a systemic functional lens should at some point include the schematisation of a lexicogrammatical rank scale. Systemic functional descriptions of languages other than English (summarised in works such as Caffarel, Martin and Matthiessen, 2004, and Mwinlaaru and Xuan, 2016) indicate that this schematisation has occurred, although this is not to say that every lexicogrammatical rank scale is identical in its formation. Various languages do follow the same structural pattern with regards to the forms of the English lexicogrammatical rank scale: French (Caffarel, 2006) and Spanish (Lavid, Arús and Zamorano-Mansilla, 2010) employ the compositional hierarchy of clause – group/phrase – word – morpheme. However, Matthiessen (1995) identifies that "certain languages have essentially no word structure so do not maintain a distinction between the word and morpheme ranks" (p.79). This is visible in the Chinese lexicogrammatical rank scale (Li, 2007) which does not employ the morpheme rank (i.e. the scale contains three ranks: clause – group/phrase – word).

Just as the number of ranks may vary between languages, so too may the systems and functions associated with each rank. In other words, "the division of grammatical labour" (Halliday and Matthiessen, 2014, p.9) is not the same cross-linguistically. Certain typological patterns appear, such as the clause acting as the most 'stable' rank across languages in terms of function (i.e. clause simplexes are generally association with the systems of TRANSITIVITY, MOOD and THEME; see Caffarel, Martin and Matthiessen, 2004), but lower ranks are subject to far greater variation. For instance, Quiroz (2008) notes that the MOOD system of English operates at clause rank, whereas Spanish calls both on the clause rank *and* on other ranks due to the rich inflectional morphology within the language. Demonstrating by way of a comparative example, English may alter the declarative *You*

speak clearly to the imperative *Speak clearly* by the omission of the interpersonal Subject at clause level. Spanish, conversely, can realise a similar distinction in MOOD through strategies including the use of different verbal (morphemic) suffixes: *Habláis claramente* (‘You speak clearly,’ declarative) and *Hablad claramente* (‘Speak clearly,’ imperative).

When compared with other languages, the strong focus on the ranks of clause and group/phrase in English systemic functional descriptions is clear. In fact, there appears to be very little attention paid to the morphemic rank in English in any systemic functional literature, to the extent that many foundational works in this area overtly include statements such as “morphology […] will not be discussed” (Matthiessen, 1995, p.76), or that while the word and morphemic rank are indeed lexicogrammatical components, “their systems are, in a sense, subservient to the higher-ranking systems” (Halliday and Matthiessen, 2014, p.86). Some recent exceptions exist, such as Peng (2016) who shifts the focus onto the morphemic rank noting both the syntagmatic potential of the morpheme in forming higher ranks and how the overarching level of text can influence a morpheme’s “probabilistic distribution” (p.45).

To briefly summarise, the dimension of rank has remained a core component in systemic functionalism since its inception in the early 1960s. Although rank scales may be formulated for the various strata of a language, the rank scale in the lexicogrammatical stratum is crucial to describing a language in terms of how its expression links to its realisation of meaning, thereby allowing for the compositional analysis of the forms and functions with regards to the grammatical labour performed at each rank. Furthermore, while similarities in the organisation of lexicogrammatical rank scales appear cross-linguistically, notable variances also exist between languages; one size does not necessarily fit all.

3 – British Sign Language: expression and simultaneity

Most systemic functional descriptive work focuses on spoken and written languages. In an effort to broaden the literature in this field, and to challenge and extend this theoretical domain, it is necessary to consider how a language that operates in the visual-spatial modality – British Sign Language (BSL) – may be described in terms of its lexicogrammatical rank scale. Prior to exploring this in further detail, however, a brief summary of BSL and how meaning is expressed is necessary to contextualise the propositions offered in later sections.

British Sign Language (BSL) is one of over 140 documented sign languages in use worldwide (Eberhard, Simons and Fennig, 2019). It is used predominantly in the UK, though the number of BSL users around the world remains indeterminate (see Chapter 2 of Rudge, 2018, for further discussion on the difficulties encountered when attempting to calculate this figure). In 2003, it was recognised as an official minority language by the British government, yet the benefits of and advances since this recognition are often disputed (see, e.g. De Meulder, 2015a, 2015b).

Communication in BSL is performed via embodied articulation which is primarily manual (i.e., via the hands). However, the hands are only part of the full communicative picture: other articulators including parts of the face and the use of the space in front of the signer are key to understanding the full semiotic potential of BSL (and of other sign languages; see Baker et al, 2016). These two broad productive areas will be referred to in this paper as 'non-manual' and 'spatio-kinetic,' respectively.

An in-depth description of the productive potential of BSL is not provided here. However, this section covers information relevant for the discussions provided later, namely: the production of different sign types (fully and partly-lexical, based on Hodge and Johnston, 2014); and the use of embodied articulators to produce meaning both in concatenative and simultaneous manners.

Fully- and partly-lexical signs

Fully-lexical signs form the primary lexicon of a sign language, otherwise referred to as the established or core lexicon (Sutton-Spence and Woll, 1999). These signs are 'listable' in the

sense that they may be found in a dictionary (e.g. Brien, 1992; Fenlon et al., 2014) and they may range in their form in terms of iconicity and arbitrariness (e.g. TREE as highly iconic, and BIRTHDAY as highly arbitrary; see Figure 1).[3] Similarly to spoken languages, a change in one phonological parameter can result in a change in meaning, such as that observed between BIRTHDAY and COUNCIL (see Figure 2).

[Insert Figure 1 here: "TREE (left) and BIRTHDAY (right) in BSL."]

[Insert Figure 2 here: "The minimal pair BIRTHDAY and COUNCIL in BSL."]

Non-manual components may accompany fully-lexical signs to modify the meaning being realised. For instance, mouth gestures may co-occur with manual signs. Johnston, van Roekel and Schembri (2015) note that mouth gestures may be prosodic in nature (see Dachkovsky, Healy and Sandler, 2013), that they may be "devoid of semantic content but match classes of manual movement such as opening, closing and twisting" (Johnston, van Roekel and Schembri, 2015, p.4; see also Woll, 2001), or that they may add further experiential meaning (e.g., adverbial/adjectival, or circumstantial). Using this latter categorisation of mouth gestures noted above, an example of this may be seen in the production of KNOW without a mouth gesture and KNOW accompanied by puffed-out cheeks: the former suggests the act of knowing and the latter suggests wider or more extensive knowledge (e.g., to know well). Further changes in other non-manual articulators such as eye aperture may also occur depending on the degree of the circumstantial information being presented (see, e.g., Chapter 15 of Sandler and Lillo-Martin, 2006).

Thus, in order for the meaning (and, consequently, the function) of fully lexical signs in BSL to be understood, the manual, non-manual and spatio-kinetic parameters must be interpreted simultaneously. This simultaneity also occurs in partly-lexical signs: signs that use conventionalised parameters (including those noted above) to realise meanings and functions (Sutton-Spence and Woll, 1999) but whose form cannot be classed as fully lexical. Hodge and Johnston (2014) identify two primary classifications of partly-lexical signs in Auslan (Australian Sign Language), although a similar categorical distinction can be argued for BSL: points and depicting constructions. Points (e.g., a handshape with only the index finger selected) in sign languages are viewed as being a part of the lexicogrammar (Fenlon et al., 2019; cf. co-speech gestural pointing; Kendon, 2004) that can be used to communicate

participant reference, location identification, discourse regulation, and so on. In each case, the point must exist in some area of the signing space - the space in front of and around the signer - regardless of whether the intended referent is physically present or not. Consequently, meaning is produced through a combination of manual elements (i.e., the shape of the point) and spatio-kinetic elements (i.e. the location in signing space that specifies the meaning).

Partly-lexical signs that realise actions and those involved in the action are known as depicting constructions (or classifier constructions; see Emmorey, 2003). These may be split further into conventional or embellished depicting constructions (Lu and Goldin-Meadow, 2018), but for the purposes of this paper this level of distinction is not required. What is important to note is that these constructions rely heavily on the simultaneous combination of manual, non-manual and spatio-kinetic elements (cf. fully lexical signs that have a stronger, albeit not sole, reliance on manual elements). Furthermore, Lu and Goldin-Meadow (2018) note that "signers may show a strong preference for depictive devices over lexical items […] simply because depictions can often provide more depth and accuracy in portraying a referent than lexical signs" (p.14). As such, it is possible use depicting constructions that encode a wealth of meaning and often require lengthy glosses in English. For example, a BSL user signing about an acquaintance who visited historic ruins used a depicting construction to express how the acquaintance found walking up a tall spiral staircase to be gradually exhausting to. This depiction was expressed as follows: the signer's dominant hand represented a pair of legs; an upwards, circular motion of the dominant hand (palm facing downwards) represented the movement up a spiral staircase; and a gradual reduction in the pace of upwards movement represented decreasing speed over time, accompanied with a progressively exasperated look on the signer's face to reinforce the increasing difficulty of the task (see Figure 3).[4]

[Insert Figure 3 here: "An example of a depicting construction in BSL."]

Concatenation and simultaneity in BSL

The above sub-section suggested that the combinatorial and simultaneous nature of BSL production: manual, non-manual and spatio-kinetic elements may be called on at various points during a signed utterance to realise meaning. However, instances of simultaneity are

nonetheless articulated over a period of time with signs being produced one after another (i.e., following a logogenetic progression; see Halliday and Matthiessen, 2014). A brief example of this concatenation can be observed when allocating referents to the signing space. This usually follows a two-step sequence: the 'what' or the 'who' (i.e., the experiential participant) is produced first, followed by a point in the signing space to place this entity in a location for later reference (with the inverted order being viewed as infelicitous in certain instances; see Neidle and Nash, 2012). A similar two-step pattern is observed in Lu and Goldin-Meadow's (2018) data: prior to depicting constructions, signers tend to name an object (i.e., using a lexical sign) prior to providing description on the object, whether via further lexical signs or partly-lexical depicting constructions.

As logogenesis is found within BSL production, this suggests that there are orders in which the signs of BSL are produced, and it is thus worthwhile to briefly address this area of study. Space does not permit a full exposition of this complex and much-debated area, but some key points may be overviewed as follows.

Studies attempting to schematise the constituent order of sign languages span decades and theoretical perspectives (see, *inter alia*, Deuchar, 1983; Engberg-Pedersen, 1993; Hoffmeister, 1978; Meier, Cormier and Quinto-Pozos, 2002; Neidle et al., 2000; Padden, 1988; Sandler and Lillo-Martin, 2006). Helpfully, Napoli and Sutton-Spence's (2014) review of the constituent orders of 42 sign languages results in the suggestion that "SOV and SVO should be the prevalent orders found in all declarative sentences" (p.12). From this, possible generalisations can be drawn. For example, in combination with the abovementioned findings by Lu and Goldin-Meadow (2018) and Pfau and Bos' (2016) identification that "no sign language has been described with a basic VSO order" (p.126), it may be suggested that verbal signs are produced after the occurrence of at least one nominal sign (i.e. the participant(s) is/are realised prior to the process) in a typically declarative construction. However, investigations are on-going and have yet to reach an agreed consensus in the sign linguistics subdomain (see, e.g., current discussions on order in Finnish Sign Language; see Jantunen, 2017. In addition, researchers such as Lutalo-Kiingi (2014) suggest that "attempts to discover one basic, underlying sign order in sign languages […] may be inappropriate " (p.120), and instead call for an analytical approach that "[permits] patterns of greater complexity, such as variable sign order according to discourse context or other factors" (ibid.).

The systemic functional perspective similarly stands opposed to finding constituent orders based on form itself, prioritising the paradigmatic over the syntagmatic (but still keeping syntagmatic affairs in mind; see Halliday and Matthiessen, 2014). As such, while the present work does acknowledge the patterned sequencing of signs that occurs in BSL, it does not intend to wade into the discussions of constituent order mentioned above. Strings of signs will be presented in the following sections which may be analysed further or indeed contested from different theoretical perspectives. Nonetheless, the primary focus from this point forward remains on the hierarchical composition of the lexicogrammar of BSL that is produced in various sequences over time (i.e., drawing together systemic functionalism and BSL to propose a working lexicogrammatical rank scale).

4 – Schematising the lexicogrammatical rank scale of BSL

This section presents a progressive development of the schematisation of the BSL lexicogrammatical rank scale. It begins by considering rank scales in previous systemic functional descriptions of languages, and then problematises their form when considering languages in the visual-spatial modality (based on the literature discussed above). Using examples extracted from recorded BSL interactions, the lexicogrammatical rank scale of BSL is developed with particular attention paid to productive simultaneity. Finally, a comparison of two similar BSL productions is offered to suggest how, from a systemic functional perspective, BSL may express more than one part of a clause at a time and how such instances might be represented via this rank scale.

Three provisos regarding the present study need to be established. Firstly, the BSL examples used here demonstrate only a small sample of the productive potential of BSL. This work is not intended to be a comprehensive review of BSL, both due to space limitations and the novelty of investigation into sign languages from systemic functional perspectives. However, these examples have been chosen to show the opportunities and challenges of schematising a lexicogrammatical rank scale for a language in the visual-spatial modality. Secondly, each example has been verified as a permissible and sensical production by native and fluent BSL users. However, for ease of comparison and to reduce variation, the examples are deliberately homogeneous in their function: interpersonally, each example is declarative; and textually, each example is unmarked. Finally, this work does not attempt to create a function-rank matrix similar to what has been produced in systemic functional descriptions of other languages. Further data must be analysed before this can be achieved, but this paper acts both as a base to an eventual function-rank matrix and as a guide for future research when working on systemic functional descriptions of languages in the visual-spatial modality.

Accounting for manual, non-manual and spatial components

Typologically, lexicogrammatical rank scales incorporate the ranks of clause, group/phrase, word, and morpheme (see [Insert Table *1* above and Matthiessen, Teruya and Lam, 2010; cf. Chinese wherein the morphemic rank is viewed as redundant; see Li, 2007). If BSL were analysed solely as a sequence of forms (i.e., without taking productive simultaneity into account), a similar rank scale of clause, group, word and morpheme may be produced.[5]

[Insert Table *2* exemplifies this possible rank scale via a simple clause that may translate as *I know him/her/it* (see Figure 4 for the production of this clause in BSL):[6] [7]

[Insert Table 2 here: "A rudimentary lexicogrammatical rank scale for BSL."]

[Insert Figure 4 here: "*I know him/her/it* in BSL."]

At first glance, Figure 4 appears to fulfil the compositional requirement of a rank scale: exhaustiveness is present as each rank is made up of one or more items from the rank immediately below. There also appears to be repetition at the word and morpheme ranks, which may lead to questions of whether the morpheme rank is superfluous. However, the productive capabilities of BSL noted in previous sections indicates that multiple articulators are called on to produce elements at word rank. Sandler and Lillo-Martin (2006) identify that "It is clear that sign linguists must pay careful attention to non-manuals in order to fully understand sentence structure" (p.473), thereby reinforcing the stance that simply repeating what is seen at word rank in morpheme rank is not exhaustive due to the productive simultaneity enacted by manual, non-manual and spatio-kinetic elements. Consequently, the form of the rank scale in [Insert Table *2* requires adaptation. One way of doing so would be to 'split' the morpheme rank into three: manual (what is produced on the hands), non-manual (what is produced on the face, torso, etc.), and spatio-kinetic (what is produced in the signing space with regards to location and movement). Importantly, this split is not intended to show a hierarchy within morpheme rank (e.g., manual is not composed of non-manual), rather it 'zooms in' on the components that combine to form the rank above. This enhanced lexicogrammatical rank scale is presented in [Insert Table *3*:

[Insert Table 3 here: "A lexicogrammatical rank scale of BSL showing an expanded Morpheme rank."]

The morpheme rank can now more accurately represent the composition of each signs. The hands produce a meaningful value, although in the case of PT:PRO3SG the meaning of the sign can only be fully understood when considering the spatial component that is simultaneously realised.

The importance of this split becomes more apparent when considering instances of BSL that call on further productive simultaneity. The following example in [Insert Table *4* (with the production of this example shown in Figure 5) demonstrates such an instance, translating to *He/She asks me incessantly* (where '++' indicates the repetition of a sign):

[Insert Table 4 here: "The extended lexicogrammatical rank scale for BSL demonstrating further morphemic complexity."]

[Insert Figure 5 here: "*He/She asks me incessantly* in BSL"]

[Insert Table *4* demonstrates how this 'zoomed in' morpheme rank permit greater clarity regarding what is produced by the signer. As in [Insert Table *3*, an equivalent pointing sign (PT:PRO3SG) is used. However, ASK++ requires further explanation. The manual form of the sign (all fingers extended except for the thumb and index finger touching at their tips) is produced by both hands rather than just the dominant hand, providing both the core meaning of the sign (i.e., the action of asking) and the idea that this action occurs frequently or extensively. The non-manual features include a puffing of the cheeks while maintaining gaze at the third-person referent in the signing space. The cheek puff emphasises the notion of frequency or degree, while the maintained gaze identifies that the previously-mentioned referent is one that is involved in the action – in this case, as the one asking. Finally, the spatio-kinetic elements provide information with regards to participant roles and, again, the nature of the process. Both hands begin this sign from the location designated by PT:PRO3SG, and end by moving through the space towards the signer themselves. Unlike KNOW in [Insert Table *3*, ASK is an indicating verb (see Cormier, Fenlon and Schembri, 2015) which employs movement between two or more points, thereby encoding or 'indicating' the participants involved in the process. In this case, the movement between the referent ('3') and the signer ('1') denotes who asks the question and who is being asked. Furthermore, the sign is repeated numerous times and at a slightly faster rate of production than the signer's usual pace, realising the persistent nature of the action.

Collectively, these components within the morpheme rank combine to represent what is realised at higher ranks, and modifications to any of these morphemic values would alter the meanings produced. For example, without the check puff during the manual production of

ASK++ in Figure 5, the manner of the action could alter from ‘incessant’ to ‘habitual,’ and if the movement altered to ‘1 → 3’ then the participants would switch in role: the signer would be asking, rather than being asked.

Accounting for greater complexity

More complex productions in BSL may be represented in the proposed adaptation of the lexicogrammatical rank scale, such as when depicting constructions are used. In [Insert Table *5* (Figure 6) which may be glossed as *The policeman follows the thief,* a depicting construction is used to realise the interaction between the two participants:

[Insert Table 5 here: “Representing a depicting construction in the lexicogrammatical rank scale.”]

[Insert Figure 6 here: “*The policeman follows the thief* in BSL.”]

Similar to previous examples and in line with observations regarding sign order noted above (see, e.g., Napoli and Sutton-Spence, 2014), signs realising the participants and their locations in the signing space are produced prior to realising the process: POLICEMAN-FOLLOW-THIEF.[8] In this case, as two human participants are involved in one action that includes movement through space, this is realised by each hand representing an allocated participant, identified in [Insert Table *5* as CL (‘classifier’). Identifying the participants and their locations in signing space (i.e., ‘x’ and ‘y’) prior to signing the process FOLLOW (expressed by the movement of one classifier handshape tracking the other) enables observers to understand which hand is associated with which referent. Consequently, the individual morphemic components of this production are critical in this sequence of signs: without the prior allocation of the participants in the signing space, it is not possible to identify who is following who; without accounting for non-manual features, the process may range in meaning from SNEAK to FOLLOW to CHASE, to name a few interpretations; and without the movement in the signing space, FOLLOW cannot be realised (i.e., a static production of both classifier handshapes would suggest that both participants are stood still).

Proposing and problematising the simultaneous realisation of similar functional elements

The previous examples demonstrate that it is possible to account for the many simultaneous productive elements in BSL by splitting the morpheme rank. On top of this, BSL permits a further level of productive complexity facilitated by the use of independent articulators, particularly the signer's hands. For instance, in some cases it is possible to use each hand to express more than one experiential process at the same time. An example is provided in [Insert Table *6* below (Figure 7) which may be glossed as *The policeman watches the thief while the thief passes by*:[9]

[Insert Table 6 here: "Simultaneous clauses in BSL."]

[Insert Figure 7 here: "*The policeman watches the thief while the thief passes by* in BSL"]

The production of the above is explained as follows. Firstly, the signer signs THIEF as a participant and then allocates THIEF to a position in the signing space ('y') using a pointing sign. Then, the signer introduces POLICE as a second participant, but does not allocate a space; the signer instead embodies this participant (i.e., the signer assumes the role of POLICE, a technique referred to as role shift or constructed action; see Sutton-Spence and Woll, 1999). With all participants established, the processes are signed: the right hand adopts a handshape and movement to represent THIEF moving in front of the signer (THIEF-PASSES-POLICE), while the left hand and non-manual features express LOOK to track the position of THIEF as it moves across the signing space (POLICE-WATCH-THIEF). The simultaneity in the realisation thus represents the simultaneity of the reported actions.

In short, the signer wished to recount two related actions that were experienced simultaneously, and the visual-spatial modality permits the simultaneous expression of these actions. In [Insert Table *6*, shaded and unshaded cells are used to associate the productive components concerned with the two processes. Note that the non-manual morphemic value cannot have two different associations as the face, torso, etc. is classed as one indivisible entity.

However, it is useful to discuss alternative interpretations for this closing example. As noted in Section 2, a feature of lexicogrammar from systemic functional perspectives is rankshift,

wherein units at a higher rank ‘shift’ downwards to operate as units of a lower rank (see Matthiessen, Teruya and Lam, 2010). In the case of Table 6 and Figure 7, it may be argued that either of the two processes shifts into group rank as a nominal group (i.e., “The policeman watches *the passing thief*” or “The thief passes *the watching policeman*”). While not refuting this interpretation in its entirety or the presence of rankshift *per se*, caution is nonetheless advised when considering the glottocentricity of this description (i.e., how much the description relies on the data from the semiotic system in question or how much it uses elements from other languages as a basis for description; see Butler, 2003).

To reiterate, BSL permits the co-occurrence of independent, meaning-bearing articulations. Among such articulations, it is possible that two experiential processes may be produced at the same time. Languages employing the spoken modality, however, are not able to orally articulate two processes simultaneously (i.e., saying “watch” and “follow” at the same time) as production is restricted and phonation occurs as a single stream: sounds must be expressed one after another. As such, a language in the visual-spatial modality has the opportunity to express co-occurring actions by expressing these actions simultaneously, rather than needing to call on other semiotic resources (e.g., hypotaxis or parataxis between clauses via the logical metafunction; see Butt and Webster, 2017). Indeed, given this simultaneous potential, one such resource that may not needed to such an extent may be the rankshift required to relate a process to a participant within a nominal group.

We may further muddy the waters of this interpretation, too. Firstly, while attempting to remain as glottocentric as possible, it must by borne in mind that there is a strong influence from spoken languages on signed languages (see, *inter alia*, Brentari, 2010; McKee, 2017; and Sutton-Spence, 1999). A truly glottocentric description may therefore be impeded by this influence. However, this issue may also be argued for across spoken languages given language contact and change: very few languages, regardless of modality, are free of cross-linguistic influence. As such, perhaps ‘visuocentric’ may be better suited in this context rather than ‘glottocentric’ (see Rudge, 2018). Secondly, it may (and, from the perspective of the author, should) be argued that semiosis in typically spoken communications also implicates the visual-spatial modality to varying extents via the use of co-speech gesture and embodied paralanguage (i.e., viewing such communication through the lens of the broader semiotic repertoire; see Kusters at al., 2017). Simultaneity in expression may thus occur through different productive modalities, such as a verbal production of “the police were

watching" as a manual gesture representing a thief passes in front of the speaker. However, as most systemic functional descriptions of languages have focused predominantly on typically 'linguistic' features, the similarity of the above argument for the description of simultaneous expression in spoken languages remains largely underexplored (cf. Martin and Zappavigna, 2019). It is hoped, though, that observations such as these provoke further study in this area.

5 - Conclusions and further study

The theoretical models and abstractions developed in systemic functionalism allow for thorough understandings, descriptions and analyses of semiotic systems. This paper has presented one such core abstraction - the lexicogrammatical rank scale - alongside its novel application to BSL. This work proposed that the lexicogrammatical rank scale can indeed be used to represent the various meaning-baring units found in a language expressed in the visual-spatial modality, but the fact that this modality permits different degrees of simultaneity in the realisation of meaning (when compared with, e.g., spoken language in one modality that can call on co-speech gesture in another modality; see Martin and Zappavigna, 2019) requires recognition in order to create accurate descriptions using systemic functional frameworks.

This is not to say, however, that the current paper offers a watertight proposal when it comes to working with systemic functionalism and sign languages. While the work is novel and testable in terms of the explanation, adaption and argumentation for a lexicogrammatical rank scale of BSL, it is nonetheless restricted in certain ways. For instance, the data employed to get to this point is deliberately limited to unmarked declaratives. While it is certainly feasible to apply further linguistic data to the proposed rank scale, work completed by Rudge (forthcoming) demonstrates that clauses realising different selections in the interpersonal system of MOOD (e.g., polar interrogative) call on additional non-manual and/or spatio-kinetic elements (i.e., changes in eyebrow position). Based on discussions raising form this paper alone, it would be assumed that these elements would be located at the morpheme rank. However, Rudge argues that these latter features act at the phonological stratum due to their prosodic nature and suprasegmentally. As such, categorising ‘that which is lexicogrammatical’ and appearing in the rank scale against ‘that which is phonological’ and does not appear in the scale is tricky: certain articulators can be attributed to either category, and a broader analysis of the rest of the sign, or even the entire utterance, must be performed to gain a more accurate insight into this split (see Mapson, 2014).

Other types of ‘split’ may also be addressed in future research that extends this work. Two on-going discussions include the point at which elements of a sign language can be categorised into being conventionalised (i.e., encoding) or non-conventional (i.e., showing), and at a broader level, the division point between what forms part of a sign language and

what is gestural (see, *inter alia*, Goldin-Meadow and Brentari, 2017; Kendon 2004; McNeill, 2015). Addressing these splits has been avoided in this paper, instead choosing to present how features that would likely occur in typical BSL may be schematised in a rank scale regardless of whether they are viewed as more or less conventional, depictive, indexical, gestural, mimetic, or so on. This was not done to shun what are extremely valid questions and areas of study. Rather, this paper intended to provide a starting point from a systemic functional perspective that assumes all non-somatic expression (Martin and Zappavigna, 2019) within the visual-spatial modality as part of a broader semiotic repertoire (Kusters et al., 2017). The author nonetheless encourages and welcomes studies that challenge and advance the proposed rank scales while taking the abovementioned oppositions into account.

The systemic functional approach seeks to understand human language as a social semiotic, and while it has developed in many ways since Halliday's initial works into what was then scale-and-category grammar (Halliday, 1961) it has very much focused on semiotic systems in spoken and/or written modalities. This work presents one of the necessary first steps towards advancing systemic functional theory in its goal of creating an accurate framework for semiotic systems irrespective of their modality of expression. Aside from what is noted above, it is hoped that more detailed investigations into the lexicogrammatical rank scale of BSL - or, indeed, of other sign languages – identify aspects such as which ranks act as 'points of departure' for which systems (i.e. the creation of a function-rank matrix). The availability of independent articulators while signing presents various levels of productive complexity within a single modality, such as the ability to produce two separate experiential processes. This leads to questions concerning how this may be accounted for in the logical metafunction (i.e., clause complexing and possible simultaneous groups and/or clauses). These questions and others have already started to be addressed in Rudge (2018), and many more investigations await, both in BSL and beyond.

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Endnotes

[1] The function-rank matrix for English can be found in Appendix 4 of Matthiessen (1995, pp.797-810).

[2] Halliday and Matthiessen (2014) also use the term "exhaustiveness" later in their work, in the sense of "everything in the wording has some function at every rank" (p.84). This latter reading is not intended here.

[3] Following conventions in sign linguistics, small caps are used to represent sign glosses.

[4] Importantly, as this kind of construction is partly-lexical, there is a strong reliance on context and co-text. The same depicting construction could, for example, represent a seated parachutist caught in an updraft, had the context have supported such an interpretation.

[5] A few notes regarding terminology are necessary at this point. 'Clause' is used here to remain consistent with other systemic functional work. However, as noted by Hodge (2013) and Hodge and Johnston (2014), the author acknowledges that the use of 'clause' for a signed language is problematic. 'Group' is used without 'phrase' as the concept of a phrase in systemic functional terms has yet to be identified securely (see Rudge, forthcoming, for further discussion on this point). Finally, 'Word,' similar to 'clause,' is used in its systemic functional sense: a rank in the grammar of a language (see Matthiessen, Teruya and Lam, 2010). The author does not wish to suggest that sign languages comprise of words as the term is understood in the spoken and written modalities. Rather, this choice has been made to allow for consistency in systemic functional terms.

[6] In this example, 'I' is not overtly signed as the first-person Senser of this mental process is implicit. Signing PT:PRO1SG PT:PRO3SG KNOW would also be felicitous.

[7] 'PT:___' indicates a pointing sign. In instances where points identify pronominal referents, the convention of "PT:PRO(person)(plurality)" is used, hence "PT:PRO1SG" indicates 'first-person singular.'

[8] A more accurate gloss, following conventions provided by Cormier et al. (2017), would be: 'DSEW(1-VERT)-MOVE:HUMAN (move-following-LH: policeman following thief)' (with a similar gloss for the other hand). However, for ease of interpretation and to maintain a level of simplicity in the rank scales, the author has chosen to use a more contextualised gloss, especially as the use of Figures assists with interpretation.

[9] This may also be translated as "The police watch the thief who is passing by," to use a hypotactic construction, or "The police watch the passing thief" in an attempt to reduce the structure to one main clause in English. This latter was identified by an anonymous reviewer, leading to the discussion in the remainder of the section.

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