# The Syntax of British Sign Language: an Overview 

## by

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A thesis submitted in partial fulfilment for the requirements for the degree of Master's by Research at the University of Central Lancashire

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## Abstract

The central aim of this research project is to identify and describe a range of grammatical structures found in British Sign Language, resulting in an account of the types of structures found and any possible motivations for their use. British Sign Language is the first or preferred language of a large number of Deaf people in Britain, and may have as many as 120,000 users (British Deaf Association, 2013). Despite Government recognition as an official language in March 2003 (United Kingdom Council on Deafness, 2003), there is little theoretical research, at an in-depth structural level, that can tell us much about the syntactic nature of the language. This research intends to expand the current knowledge of the syntactic processes occurring in British Sign Language, which has been established to some degree by Brennan et al., 1984; Kyle and Woll, 1985; Deuchar, 1984 and more recently Sutton-Spence and Woll, 1999, and Cormier, Smith and Sevcikova (2013, in press). With its central focus on clause structures, this research investigates the following questions:

1 What syntactic structures are found in BSL?
2 What are the frequencies of predicate types and clause structures?
3 What influences on syntax does the visual cognition of BSL users have?
4 What influences on syntax does the morphology of the language have?

The analytical approach taken is to analyse British Sign Language entirely in its own terms and not to assume a priori a syntactic model derived from spoken languages. While conducting an inductive level of research with regards to the data, the approach is informed by cognitive linguistics (Croft and Cruse, 2009) and the semiogenetic model of signed languages (Fusellier-Souza, 2006; Slobin, 2008). The analysed data comprise samples of narratives selected from The British Sign Language Corpus, compiled by the Deafness Cognition and Language Research Centre, based at University College London. Presented in the form of quantitative tables, the analysis leads to statistics of types and frequencies of use of the central predicate structures found, as the study examines constituents within clauses and relationships that enable clause linkage. These types and frequencies are then considered in light of a cognitive explanation for their occurrence and illustrated by qualitative examples in boxes-within-boxes notation form (Kay, 2002).

## Acknowledgements

Studying a language and compiling a thesis of the processes and outcomes is no easy task. In the case of this research project, support and encouragement have been provided at every stage and I would like to take this opportunity to thank the many people who have provided that support.

Firstly, my family and friends have offered many hours of listening and understanding when the task seemed too difficult and my confidence was low. My heartfelt thanks go to them all and I am so thankful to have such a loving family. Thanks go particularly to Lesley Davidson and Cate Cassidy for the motivation and endless conversations about this language and its users.

Due thanks go to And Rosta and Robert Lee, my supervisory team, for the academic support and guidance and motivating conversations. Thanks also to current and existing colleagues in the BSL and Deaf Studies department at the University of Central Lancashire, especially Mark Heaton, Nicola Nunn, Gary Quinn and Clark Denmark, for all their sincere support and belief in my ability to achieve this task.

Final acknowledgements are paid to the members of the Deaf community who have made immeasurable contribution to this work by partaking in the British Sign Language corpus project that has informed this research, and for their tireless commitments to the linguistic study of this language.

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## 1 Chapter One - Introduction

From the very outset of this thesis, a crucial premise is set: that sign languages are natural, organic, human languages that have evolved, and continue to transform, in the same ways and for all the same reasons that spoken languages do. All across the world, sign languages employ the visual/corporal channels, allowing language input via the eyes and output via the hands, face and upper body. Sign languages are the means by which Deaf communities mediate their life experiences:
"Deaf communities contain their own ways of life mediated through their sign languages."
(Ladd, 2003: xvii)


Figure 1-1 The British Sign Language Corpus
(Moyle, Beeke, Mahon and Mahon, 2010)

### 1.1 British Sign Language

British Sign Language (BSL) is an indigenous, visual-gestural (sign) language of Britain. This is a language that has been used for many years, its first recorded observation being made in the parish records of St. Martin's Church in Leicester in 1576 (Jackson, 2001). The records note that a Deaf man, Thomas Tilsye, took his wedding vows in 'sign language'. Later, in 1602, a Survey of Cornwall carried out by Richard Carew also makes mention of Deaf people communicating in signs, clearly without any exertion:

Edward Bone...deafe from his cradle, and consequently dumbe...vsed verie effectuall signes, being able therethrough, to receiue, and perform any enioyned errand...Somewhat neere the place of his birth, there dwelt another, so affected, or rather defected, whose name was Kempe: which two, when they chaunced to meete, would vse such kinde embracements, and other passionate gestures, that their want of a tongue, seemed rather an hinderance to others conceiuing them, then to their conceiuing one another.
(Carew, 1602: p140, cited in Jackson, 2001)

BSL has continued to be used by members of the Deaf community and has a thriving community of users, despite a world-wide ban on the use of sign languages in education and in the home, at an education conference in Milan in 1880. This ban was the result of many years of scholars and educators philosophising that deaf children would be less likely to learn to speak if they were allowed to acquire, and communicate through, a signed language (see Lane, 1984 for a detailed account of the conference rationale and resolutions). The results of the resolutions have been the catastrophic oppression of many of the world's sign languages, and native language suppression for many of the world's deaf people; this has also led to many signed languages across the globe being afforded low status by the wider society. Despite this, Deaf people have increasingly retained their own positive attitudes towards sign language use (Woll, Sutton-Spence and Allsop, 1990). The World Federation of the Deaf reports that it is only within the last two decades that governments have begun to recognise signed languages as official languages:

In some countries the rights of Deaf people to education and equal participation in the society are secured by legislation. In others it is forbidden to use sign language even in class rooms. A deaf person's access to sign language and belonging to a Deaf community should not be denied or ignored by governments.
(World Federation of the Deaf, 2012)

Consequently, statistics regarding the number of BSL users, as for many sign languages, are largely unsupported. The Ethnologue 16 (Lewis, 2009) lists only 126 sign languages among its recorded 6,909 live world languages. Skutnabb-Kangas, Maffi and Harmon (2003) propose that "there may be as many sign languages as there are spoken
languages. Nobody knows their numbers with precision because they are as yet poorly studied and because each country usually recognizes only one sign language, if any" (p. 24). Under its listing of BSL, the Ethnologue suggests a population of 40,000 users but this is following a reference from Deuchar 1984 and may not be current, given that BSL has become more available since, as the afore mentioned 'ban' no longer exists, and BSL finally achieved Government recognition as an indigenous language of Britain in March 2003 (British Deaf Association, 2012). A primary organisation for deaf people, Action on Hearing Loss (2009) stated in 2009 that there were "no reliable current figures" and, furthermore, the results of the 2011 UK Census interestingly reveal that only 22,000 people "reported a sign language as their main language" (Office for National Statistics, 2013). This may not be an accurate statistic, given that the question was presented as "What is your main language?" and it is likely that many hearing people who completed the census on behalf of their households would not consider BSL as a language; or it may be a reflection of the continuing suppression of sign language use for many deaf people due to advancing technologies, such as cochlear implants. The census statistics, then, remain largely unreliable in a similar way to findings by Johnston (2004) regarding Australian Sign Language (Auslan) statistics: "the size of the Deaf community has been consistently and substantially underreported...how accurate the census figures are is thus open to question" (p. 364). The British Deaf Association's chief executive, David Buxton, in a strong reaction to the UK Census result, states that:
...the census gives a wholly wrong impression of numbers. By asking the question confusingly, it undercounted those for whom BSL is a first language. It also did not, of course, count the many tens of thousands of deaf people who use BSL alongside English...The Department of Health's latest GP Patients survey, however, estimates there are 122,000 or eight times as many BSL users.
(British Deaf Association, 2013)

Given that this estimate may be realistic; this cites BSL as a language with a significant community of users. This is relevant, given that the Ethnologue (Lewis, 2009) statistics indicate that as much as $80 \%$ of the world's languages have less than 100,000 users.

### 1.2 Researching signed languages

The previous section noted that signed languages are relatively understudied and this is the case for British Sign Language. This may in part be due to the fact that sign linguistics did not emerge as a discipline until the 1960's (as section 2.1 explains) but may also be due to the fact that researching languages that employ the visual-gestural modality poses several difficulties. Firstly, sign languages do not have a conventional written form. Attempts have been made to devise a notation system for sign languages, such as the most commonly used Stokoe Notation System (Stokoe, Casterline and Croneberg, 1965). This comprises a phonemic script of letters and numerals used to denote the shapes of the hands, and a series of iconic diacritics used to transcribe their locations, movements and orientations. The original notation system has been extended (such as Mandel 1981, cited in Thoutenhoofd, 2003) to account for more phonological features, and what is now known as the BSL Stokoe Notation System has adapted the original to allow further attention to be paid to the orientation of signs and to include more relevant diacritics (Thoutenhoofd, ibid.). The following example from Fortunes internet blog (2009) illustrates the transcription of the noun sign WATCH according to the BSL Stokoe Notation System (Figure 2):

## Watch



Location: Back of wrist
Right Hand: Index and Middle finger predominant Accent: Fingers slightly clawed Left palm orientation down Right palm orientation left Movement: Short movement down Hand arrangement: Contacting each other


Figure 1-2 Notation of noun sign WATCH
(Fortunes FMP Blog, 2009)

This system of notating signs is cumbersome and only relevant for the reader who is familiar with the notation symbols. A simpler and more widely used process for notating signs is 'glossing' - the attempted representation of manual signs as capitalised English words, accompanied by descriptions of non-manual features via diacritics (superscripted glyphs that appear above the ascender line). Sutton-Spence and Woll's example (1) of glossing of a negated clause may help to illustrate this frequent way of representing manual and non-manual features:
(1)

## neg <br> WOMAN TELEVISION WATCH <br> ‘The woman didn't watch television’

(Sutton-Spence and Woll, 1999: 74)

Here, the manual components of the BSL sentence are glossed in capital letters and the correlated diacritic line with 'neg' stretches across the whole of the gloss, indicating clause-level negation. While this is an accepted system for presenting samples of sign language use, it does have its limitations, which are discussed in more detail in sections 4.1 and 4.2.3. In the study of the syntax of American Sign Language (ASL), Neidle, Kegl, Maclaughlin, Bahan and Lee (2000: 21) stress that "since there is no one-to-one correspondence between English words and ASL signs, this means that the English glosses often to do not permit complete recoverability of the manual signs". Despite its limitations, research scholars and lexicographers have so far made use of this notation form (Brien, 1992).

Neidle et al. (2000), who suggest that "unique demands are placed upon linguists studying signed languages" (p. 7), address this issue, one that is not faced by researchers of spoken languages, at length. The difficulties that comprise these demands, according to Neidle et al., also include the task of effectively transcribing the non-manual aspects of sign languages that form an integral part of the grammatical system. It is relevant to note here that Slobin (2008) warns against the temptation to categorise features of sign languages according to a division labelled as manual and non-manual features, rightly proposing that this division renders manual features as the primary elements and nonmanual features as adjunctive or prosodic. Sandler (2010) notes that the hands, "whose main function is to transmit words, also play an important role in prosody, while other -non-manual - articulators of the body play a number of different linguistic and paralinguistic roles in sign languages in addition to prosodic roles" (p.300).

A further issue raised by Neidle et al., and by many other scholars (e.g. Deuchar, 1984), involves the difficulty of accessing language use that is most natural and least monitored and adapted by the users. Most known sign languages are in contact with the national spoken language and this may result in a high level of code-switching, code mixing or interlanguage (Woll, 1998; Zeshan, 2006), often resulting in a 'signed form' of the spoken language when the user is more conscious of their output (Neidle et al., ibid: 8). In the case of BSL, a clear situation exists where the language may be used in its most natural form or may be subject to increasing influence from English, particularly on a syntactic level. Due to the low status that BSL has experienced as a result of the ban on signed languages, it is often the case that a user will produce a more contact-influenced form when most conscious of their language, e.g. when participating in research elicitation activities (Deuchar, 1984). The collection of sign language corpora, beginning with Johnston and Schembri's (2008) corpus of Australian Sign Language, has aided this situation to some extent. The use of a corpus for research purposes helps to avoid the phenomenon of "observer's paradox" (Labov, 1972), where the researcher's presence during elicitation tasks or interviews may result in the participants producing what they perceive to be the desired language output, rather than their natural articulation. This, then, is at least a step closer to samples of BSL data that are least monitored.

### 1.3 Research aims and thesis structure

This chapter has so far served to introduce the reader to some demographics related to British Sign Language, namely the historical use of the language and the possible number of language users. It has also highlighted some of the demands that are placed upon researchers of signed languages, given the contact situation and the visualgestural modality that they employ. As no comprehensive study of BSL syntax has yet been carried out, this research aims to identify and describe the types of clause structures used and to identify any patterns or particular motivations for clause structure. In order to achieve this aim, the study undertakes the difficult task of defining the verbal categories in order to determine the types of predicates found and the frequencies of their occurrence. A clear understanding of predicate types and their importance is essential in order to appreciate the nature of the syntax of the language. With its central focus on clause structure, the following chapters enable the research to explore the following questions:

5 What syntactic structures are found in BSL?
6 What are the frequencies of predicate types and clause structures?
7 What influences on syntax does the visual cognition of BSL users have?
8 What influences on syntax does the morphology of the language have?

The next chapter comprises a review of academic literature related to this study, in order to highlight existing knowledge. The literature review takes a chronological form, highlighting areas that are of natural interest to the dissertation overall. In order to introduce the reader to the linguistic nature of signed languages, the review begins by describing the origins of sign linguistics and presents the widely adopted categorisations that are used to describe signed languages. Moving through the published texts that have paid attention to the syntax of British Sign Language, the chapter considers the simultaneity with which signs are articulated and the grammatical use of non-manual features. The review then discusses further syntactic processes that have been identified, including pre/post and simultaneous modifications to signs and the movement of signs in the signing space. The literature review, then, highlights the main themes that have been recognised by researchers so far and sets the context for the central themes that will be examined and discussed during the main body of this research project.

In chapter three, the thesis presents the theoretical background that underpins the analysis, and the methodological considerations taken, in order to provide a rationale for the chosen research activity. First, the classical phonemic approach is discussed and the chapter examines the influence that formalist traditions in spoken language research have had on the study of sign languages. The transformational approach taken by generative grammarians is detailed next, and the chapter examines the introduction of a syntactic framework under this approach to the field of linguistics. On a theoretical level, the first section of chapter three also illustrates functional and cognitive approaches to syntax, highlighting the functionalists attempt to explain language structures in terms of external motivations, and the cognitive linguists attempt to understand the relationship between human conceptualisation and syntactic phenomena. The third chapter next illustrates the Construction Grammar method chosen for analysing the syntax of BSL here. The rationale for this method is closely followed by an illustration of how this method of research works. The chapter then moves to provide the reader with further methodological information, including the inductive process and the use of corpus data in order to apply a combined quantitative and qualitative approach. The chapter ends by providing the reader with a
clear understanding of how samples for this research study were chosen from the corpus and the demographic information that they contain.

The fourth chapter begins with a brief presentation of some data and explanation of the notation system, glossing, used. The data is presented with as much attention to linguistic detail as possible and the supplementary diagrams serve to aid the reader's appreciation of the corpus and the selected linguistic constructions. The data analysis process is next presented, beginning with a description of the segmentation of the data into units for analysis. The following sections provide the reader with some understanding of how the data was further organised into categories and topics, and the process for presenting samples of analysed data. Finally, this chapter considers the adequacy and reliability of the data and its application in the thesis.

In the final chapter, the findings of the analysis are presented and discussed. The chapter begins with attention to quantitative results, and tables of predicate and clause type frequencies are presented. The section next provides a quantitative overview of the distribution of predicate and arguments across the data from the 32 participants. This chapter next moves to a qualitative approach, where examples from the data are selected to invoke discussion of the syntactic arrangements of BSL. Attention is first paid to constituents within clauses, where predicates types are the central focus. The section then illustrates the relationships between clauses and considers the use of co-ordination and subordination in BSL. The use of the notation system and glossing of lexical items and clause structures aims to provide as much detail as possible in order to illustrate the grammatical features of each construction.

## 2 Chapter Two - Literature Review

### 2.1 The origins of sign linguistics

Formal research into signed languages began in the late 1950s, firstly in Holland (Tervoort, 1958) and next in America (Stokoe, 1960). Stokoe, a practising lecturer in the US, began to question the nature of the hand movements used among the deaf people that he taught. This was at Gallaudet College, the only higher education establishment exclusively for deaf students at the time. Centring his work on the phonological make-up of the hand movements, Stokoe (1960) was soon to devise a descriptive framework for notating and analysing the communication system used by American Deaf people, the Stokoe Notation System (see section 1.2). This research is set within a classical phonemic framework and Stokoe's pioneering work evoked a recommendation for this method of communication to be regarded as natural human language, leading to the designation ‘American Sign Language’ and the naissance of sign linguistics.

The next two decades saw the work of William Stokoe replicated and applied to many of the world's sign languages, as linguists across the globe commenced research on the three parameters (movement, handshape and location) of their national signed language. Research in sign linguistics quickly expanded but it was not until several years later that Battison (1974) called for a fourth manual parameter, 'orientation', to be included for descriptive purposes. This would serve to describe the direction of the palm and fingers in a sign and its use became quickly widespread. The work of Klima and Bellugi (1979) on the linguistic functions of parts of the body other than the hands led to the addition of the fifth conventional parameter - 'non-manual features' (movements of the eyes, head, body, etc.). Establishment of the five phonological parameters paved the way for researchers to study signed languages under a theoretical background of distinctive feature analysis, thus examining the individual arrangement of each parameter, as Brennan, Colville and Lawson recall:

Already several linguists have attempted distinctive feature analyses of handshape and position in sign languages and have provided glimpses of the application of a generative approach to the phonological level of sign language.
(Brennan, Colville and Lawson, 1984: 9)

Enquiry soon moved from phonological descriptions of American Sign Language to analysis of grammatical processes, including some analysis of sign language syntax (e.g. Fischer, 1974, 1975; Friedman, 1976). Here, the simultaneous and inflectional nature that signed languages encompass became the centre of much attention, and will also be a recurring theme throughout this literature review and further into the thesis. It was not until the late 1970s that sign linguistics made its way across the Atlantic and stimulated research into the language used by the British Deaf community. Beginning with sporadic journal articles, evidence that linguists were paying attention to this language began to appear, including Brennan's (1976) enquiry into language acquisition for deaf children, Deuchar's (1977) research into sign language diglossia, and a study of language abilities of deaf children by Kyle et al. (1978). In 1981, an Edinburgh-based research project, fronted by Brennan, Colville and Lawson, finally led to the first comprehensive description of British Sign Language, titled 'Words in Hand'. This landmark text introduced the first structural analysis of British Sign Language and the researchers inform us that they "adopted a structuralist minimal pair analysis in order to identify distinctive contrasts and hence distinctive elements" (Brennan et al., 1984: 173).

Although attention was paid mostly to phonological elements, the researchers gave us a brief account of British Sign Language morphology and paid some attention to syntax, introducing crucial grammatical aspects that impact on the syntactic arrangement of this language: the movement of signs in the signing space, the use of non-manual features, the phenomenon of simultaneity, and handshapes that function as proforms. Here we find explicit reference to the spatial nature of British Sign Language syntax:

The nature of syntax in BSL is affected by two important characteristics of sign languages: spatiality and simultaneity. By placing signs at particular points in space and setting up relations between these points it is possible to indicate such important syntactic information as subject-object relations, noun modifications and pronominal reference. Clearly morphological and syntactic mechanisms interact to provide the complete grammatical information.
(Brennan, Lawson and Colville, 1984: 186)

Resulting in similar findings to the counterpart research into ASL, then, research into the principles of British Sign Language was identifying the simultaneous articulation of signs and the use of the signing space for linguistic purposes as core syntactic processes.

### 2.2 Simultaneity and the use of spatial grammar

In a short space of time, leading sign linguists began to pay attention to the grammar of British Sign Language, contributing articles to the first collected body of work on the language in 1981. In a section dedicated to 'Linguistic Aspects', Woll's (1981: 108) introduction to 'Perspectives on British Sign Language and Deafness' informed us that the chapters "combine to give a preliminary view of the linguistics of British Sign Language", which was in its research infancy at this point. Paying specific attention to the syntactic ordering of question markers in British Sign Language, Woll (1981: 142) examined the option of placing the question marker at the beginning or at the end of the clause. Woll further explored the option of placing the marker at both ends of a clause, introducing the concept of 'bracketing' to BSL syntax research. Furthermore, Woll raised the issue of the simultaneous articulation of manual and non-manual features and began to expand our understanding of the simultaneous organisation of the language (ibid.: 146-149).

Brennan (1981) extended previous analysis of the morphological components of British Sign Language and touched briefly upon syntax, suggesting primarily that "the traditional distinction between syntax and morphology is not so easily applicable to sign languages" (ibid.: 123). The interface of morphological and syntactic devices, which we shall return to later in this review, was one of the early concerns of sign linguists. During a discussion of the incorporation of subject and object into the form of the sign, Brennan highlighted the inflectional nature of the grammar of this language and we continued to see how the spatial dimension and the ability to articulate linguistic features simultaneously forms the basis of its syntactic operations. The location and movement of signs in the signing space was reported as being of prime morphological relevance and Brennan's research also found that "...other aspects of location may be viewed syntactically, in that we must take account of other items in the utterance and recognise the relationships that exist among them" (ibid.: 124). Brennan's example of the verb sign WALK illustrates this notion:

In the example, 'He walked towards the two people', one hand produces the sign for TWO PEOPLE...while the other produces the sign for WALK...If we ignore the other item in the utterance we could misinterpret the sign WALK as 'walk away', 'walk out' or simply 'walk'.

Deuchar's contribution to this text expanded the field of British Sign Language syntax even further with the results of an investigation of variation, which found syntactic variation resulting from situational formality. The formality of the situation was seen to affect the ordering of constituents and Deuchar (1981: 114) noted that signers tended to use a structure more similar to that of English syntax (i.e. subject-prominent) in formal situations and a structuring of signs more in keeping with a topic-comment nature in less formal settings. In the following years, Deuchar (1983) paid further attention to the syntax of British Sign Language, resulting in a chapter in the next edited book of British Sign Language research where the fundamental question was asked, 'Is BSL an SVO language?' This time examining recordings of spontaneous signing as a method of data collection, and employing "mostly semantic criteria to identify the category of verb and noun" (ibid.: 69) for data analysis, Deuchar was cautious to classify British Sign Language as any specifically ordered language and expressed difficulty in determining a basic sign order from the given data (ibid.: 70). In addition, Deuchar referred more explicitly than previous authors to the effects on syntax of the simultaneous nature of British Sign Language and its exploitation of the spatial dimension:

While ignoring the spatial dimension of BSL, I have concentrated on the temporal dimension, on how relationships between signs might be expressed by temporal sequence, and I have suggested in particular that topic occurs sequentially before comment...i.e. utterance-initially. But since the spatial dimension is also available to BSL, we might expect topic to be marked spatially as well as temporally, either by the simultaneous occurring of a topic-marking signal in a channel other than the hands, or by the spatial relationship between signs representing topic and comment.
(Deuchar, 1983: 72)

In this same collection of work, the analysis of constituent order was also discussed by Kyle (1983), who considered the internal processing of language during an exploration of signed narratives. In an attempt to ascertain the reason that sign language learners who are not deaf often do not understand sign language when Deaf people use it, Kyle introduced a psycholinguistic analysis to the field of sign linguistics in Britain. Kyle states that the tendency so far had been to discover linguistic units and then consider their possible combinations, resulting in a "bottom-up" process and that, "from a psychological
point of view at least, grammar is subject to higher control processes" (ibid.: 186). Kyle did not discount the structural approach to the study of sign languages, rather he suggested that an 'event-structured' analysis might serve to "complement and provide an alternative explanatory framework":
...HE-SEE-ME may not be a concatenating of three sign units, but rather a simple event-based expression using the sign 'SEE' to present the image of what occurred or could have occurred. One might then predict the grammatical construction from the meaning to be expressed and see its presentation in Sign as a reflection of some event-based schema rather than a syntactic process of the type we generally find in speech.
(Kyle, 1983: 193)

Furthering her work on various aspects of British Sign Language led to the publication of a book by Margaret Deuchar, in 1984, which included a more detailed description of the structure of signs and of the grammatical operations of the language. Paying attention to spatial grammar again, Deuchar (1984: 81-105) provided details of modifications to parameters that perform syntactic functions. For example, changes to the direction of the movement parameter of a sign was proposed as a marker of case; modifications to the form of the handshape parameter were seen to indicate properties of the subject or object of the verb and modifications to both the movement and handshape parameters were reported as processes that allow for negative incorporation to utterances. In this text, Deuchar also discussed the simultaneous use of manual and non-manual features and reminded us of the importance of understanding this use of a simultaneous, as well as a temporal dimension.

### 2.3 Further research and classes of verb signs

Further research led to Kyle and Woll's (1985) description of British Sign Language grammar and reference to the consistently recurring themes: that pre, post and simultaneous modifications of signs may influence the ordering of constituents and that the syntax is affected by the use of simultaneity in the language, particularly the simultaneous articulation of manual and non-manual features. It is in this text that we are informed of classes of verb signs, which were categorised then as 'invariant', 'directional' and
'reversing' verbs (p. 139). In this analysis, the verbs were categorised according to the capacity to move around in the signing space and undergo modifications. Building on Kyle's (1983) previous study of internal linguistic processing in Deaf people, this book also dedicated a section to 'the psychology of sign'. In an exploration of perception, remembering and recall, Kyle and Woll (1985: 195-215) examined the effects of auditory deprivation in these areas and concluded that Deaf people's representation of events is processed visually, leaving us with the notion that the syntax of BSL has to be understood through its "visual presentation" (ibid.: 214).

In 1992, a project that had been ongoing for several years, inspired by Allan Hayhurst, former General Secretary of The British Deaf Association, brought to the field the first dictionary of British Sign Language. A theoretical introduction to the dictionary includes a chapter on grammatical patterning, containing further discussion of simultaneity and sequentiality, and stressing that "we need to keep in mind the interaction of manual and non-manual patterning and the inter-relationship between multi-layered simultaneous structuring and linear, sequential structuring" (Brennan, 1992: 99). Brennan was keen to remind us of the two-fold nature of the language:

The kind of inflectional morphological patterning that we have seen in this last section can only work because of the way in which BSL syntax makes use of space...the words of BSL which are themselves structured both sequentially and simultaneously enter into different kinds of grammatical process within the areas of syntax and morphology.
(Brennan, 1992: 114)

Following from this, Brennan (1994) directed her attention to the issue of word order directly, resulting in a chapter in an edited text of working papers in 1994, in which Brennan questions the extent to which temporal (i.e. sequential) and simultaneous patterning exists, concluding that "differences in view and perspective occur with respect to the degree of dominance of one type of patterning over the other" (ibid.: 31) (see also Liddell and Johnson, 1989 for ASL). Furthermore, Brennan expanded the developing question of whether word classes are the same across spoken and signed languages, illustrating the presence of only a comparatively small set of overt adjectives in British Sign Language due to size and shape being often incorporated into the noun or verb sign ( p . 35). After questioning the definitions of 'subject' and 'topic' in sign language research,

Brennan finally questioned the theoretical approaches to word order studies taken. Comparing a syntactically oriented approach to a pragmatically oriented method, Brennan suggested that signed languages fit the latter, as they "appear to be morphologically rich and to have what appears to be relatively flexible word order, which can vary according to pragmatic requirements" (1994: 40).

Sign linguistics research continued with another landmark text, a book titled 'The Linguistics of British Sign Language'. The continuing study of this language led to SuttonSpence and Woll producing an introductory text, in 1999, focussing on various aspects of British Sign Language grammar and use. Syntax was not of prime concern to this book but some attention was paid to the construction of signed sentences and Sutton-Spence and Woll (1999: 41-50) emphasised the effects of a proposed predicate classifier system and the use of proforms on the syntax of this language. The text also provided a more comprehensive description and alternative classification of BSL verb types, based on the grammatical information that can be conveyed by their modifications:

Plain verbs - can be modified to show manner, aspect and class of direct object;
Agreement verbs - can be modified to show manner, aspect, person, number, and class of direct object;
Spatial verbs - can be modified to show manner, aspect and location, movement, and related noun.
(Sutton-Spence and Woll, 1999: 135)

In this text, a detailed description of the incorporation of number and person into pronoun signs and the movement of proform handshapes in the signing space provided further insight into how "the placement and movement of signs in space indicate their relationship to each other" (ibid.: 44). Providing the most detailed descriptions of inflectional morphology so far, the implications of this for syntax were made explicit, as the authors presented detailed processes for the combining of signs into phrases and sentences, including the following:

- The topic (most often a noun, noun phrase or pronoun and the goal) is usually established first then the comment is signed;
- Lexical time markers appear at the beginning of sentences;
- Question signs are placed at the end of sentences (and can occur at the beginning and the end in the form of question-copy);
- In the case of pronouns, proforms and predicates, the full sign (indicating the referent) usually comes first;
- In pronoun copy, the index used for the pronoun is repeated at the end.
(Sutton-Spence and Woll, 1999: 51-55, re-worded)

Since the publication of Sutton-Spence and Woll's (1999) introduction to the linguistics of BSL, there have not been any published text books providing more detailed descriptions exclusively of the syntactic arrangement of BSL but research scholars continued to explore and examine the syntactic features in a succession of articles in journals and chapters in edited texts. These works focussed mainly on neurobiological aspects of sign language use and on child acquisition of BSL but have consistently made reference to syntax. Of relevance to this study is Morgan, Herman and Woll's journal article published in 2002. This marked a change in perspective, as the study of children's acquisition of complex verb constructions was seen in light of verb argument structure and conceptual categorisations, a more cognitive orientation than previous studies (also Morgan and Woll, 2002). Features of spatial grammar were considered in depth and the article provided insight into the use of 'referential space', i.e. a body shift that indicates the agent's point of view non-manually, without index pointing. The effect of the use of non-manual features for the syntax of BSL was also discussed:

The second feature important in complex sentences in BSL is the use of nonmanual morphology...Particular constellations of non-manual markers signal structures such as conditional clauses, topics, negation, interrogation, and relative clauses. In certain contexts e.g. negation, the non-manual marker may be the only morphological indicator. The markers can occur with a single manual lexical sign or across multi-sign propositions, having phrasal and clausal scope.
(Morgan, Herman and Woll, 2002: 661)

A further journal article, this time focussing on brain activation during the processing of spatial information, provided more in-depth details regarding the use of space in BSL. MacSweeney, Woll, Campbell, Calvert, McGuire, David, Simmons and Brammer (2002)
analysed neural responses to the use of the signing space, providing details of the use of topographic space, i.e. the articulation of "real-world spatial relations" via movement of signs across the signing space. This study concluded that there is more activation in the occipito-temporal area when signing contains increased use of topographic space and highlighted this as an effect of simultaneous syntax, a recurring theme throughout this literature review.

Details of the way signed constructions are connected in BSL was examined in an article published in 2005, an important study for this research. Waters and Sutton-Spence provide a detailed description of 23 types of connectives that occur at sentence and discourse level, including manually marked connectives (such as BUT, MEANS and THROUGH), non-manual connectives (such as 'if' and solo mouthing) and asyndetons, i.e. coordination of units without overt lexical signs (which account for $6 \%$ of their data). The study found that English-derived connectives are highly frequent in BSL but there are also conventional manual and non-manual connectives that are inherent to BSL. The use of English-derived connectives is accounted for by the phenomenon of language contact and the article also explains that the type and frequency of connective used is often dictated by the type of discourse. Subsequent articles that contribute to our knowledge and understanding of the syntax of BSL include Morgan, Barrière and Woll's (2006) continuing study of morphological verb agreement, which noted deaf children's late onset of acquisition of agreement verbs due to their morphosyntactic complexity, and SuttonSpence and Woll's more recent published chapter in an introductory linguistics reader in 2010. The brief discussion serves as a concise summation of what the field of sign linguistics had discovered about the syntax of BSL to this point:

- BSL is not a language with strongly preferred Subject Verb Object (SVO) order like English; it has much freer word order
- BSL word order is variably influenced by English, depending on the background of the signer and addressee(s), on formality and situation
- BSL verbs can incorporate the object, for instance EAT-PIZZA is a different verb from EAT-APPLE
- Topic before comment is an important principle of word order in BSL
- Topic is marked not only by position, but by pause or various suprasegmental features

The final text that this review will mention indicates a marked development in our understanding of sign languages and of the syntactic structures of British Sign Language. Cormier, Smith and Sevcikova (in press) bring the developments made in other sign languages (particularly for Auslan in Johnston and Schembri, 1999) to the workings of BSL and highlight the more recent appreciation of sign language structures. This text describes a range of structures, and distinguishes verb signs into lexical, partly lexical and nonlexical classes of verbal predicates. This lexicalization principle, that is, the classification of verbs according to degree of lexicality, is particularly effective for signed languages, as the visual modality enables exploitation at the partly and non-lexical levels. Johnston (2013) provides a clear distinction for the hierarchical sub-sets of verb signs according to this classification system, presented here with slightly re-worded explanations of each type and a following diagram that illustrates this hierarchy visually:

Fully-lexical signs are highly conventionalised in both form and meaning in the sense that both are relatively stable or consistent across contexts. Fully-lexical signs can easily be listed in a dictionary. Type:

Plain Verb: A verbal sign which cannot be physically moved about in space. These verbs are usually body anchored.

Partly-lexical signs are combinations of conventional and non-conventional (highly contextual) elements. They cannot be listed in a dictionary in any straightforward way. Types:

Indicating Directional Verb: A verbal sign that can change its start and end positions in the signing space;

Indicating Locational Verb: A verbal sign that can change its location in the signing space;

Depicting Motion Verb: A verbal sign that depicts the movement or displacement of entities;

Depicting Size and Shape Verb: A verbal sign that depicts the size and shape, or the handling of entities.

Non-lexical signs are essentially gestures (i.e. intentional communicative bodily acts, both manual and non-manual) that appear to have no language specific conventionalized form/meaning pairing of their own. Type:

Gestural Verb: manual and non-manual verbal behaviours that do not appear to fit easily or readily into the category of plain, indicating or depicting verb signs.
(Johnston, 2013, re-worded; emphasis in original).

## BSL VERB TYPES



Figure 2-1 Hierarchy of BSL verb types

This study proceeds with the use of this classification of verbal signs according to degree of lexicality, as it enables the research to effectively examine the types of syntactic structures that are prevalent and their relation to potential for combining manual and nonmanual features into signed constructions. It is clear from this literature review that the field of sign linguistics has, over its forty existing years, developed an increasing awareness of the grammatical features that are inherent to British Sign Language and this accumulative knowledge is referred to at various points during this study.

## 3 Chapter Three - Theoretical Background

Sign language linguists have begun to create tools with which to arrive at a deeper and more comprehensive understanding of human language, human cognition, and human social interaction. Indeed, old paradigms are fading and revolutionary new ideas are growing up across disciplines, languages, and countries. The habitual molds are being broken and new molds are beginning to be formed. It is a time for flexibility, ingenuity, and innovation.
(Slobin, 2008: 128)

### 3.1 Theoretical approaches

### 3.1.1 The classical phonemic approach

Research into the workings of British Sign Language has spanned the past three decades and has been influenced mostly by the classical phonemic approach and by generative grammar frameworks. The formalist traditions in sign language research came from the primarily structuralist approach to the analyses of spoken languages that began early in the 1900's, after the work of Ferdinand de Saussure ([1916]1981) was published. Until then, linguistic analysis had developed from the original work of the Greek and French grammarians, who focussed on the prescriptive rules of grammar, into the approach of the philologists and comparative philologists, where attention was paid to the language of written texts. Discontent with the limited scope of grammarians and with the "erroneous and insufficient conclusions of the philologists" (ibid.: 5), de Saussure proposed a radically different, synchronic analysis of language. This analysis made clear a distinction but also interdependence between language and speaking:

Language is necessary if speaking is to be intelligible and produce all its effects; but speaking is necessary for the establishment of language...Language and speaking are then interdependent; the former is both the instrument and the product of the latter. But their interdependence does not prevent their being two absolutely distinct things.
(de Saussure, 1981: 18-19)

This distinction paved the way for the mechanistic approach to linguistic analysis with a focus on form alone, which was expanded in America and Europe by leading scholars, such as Bloomfield (1933) and Jakobson (1941). For classical phonemic theory, an approach was taken that resulted in phonemic accounts of language that focussed on relationships within forms, most structuralists at the time employing some version of Hockett’s (1960) 'Four Fundamental Principles of Phonemics':

The Principle of Contrast and Complementation;
The Principle of Phonetic Similarity;
The Principle of Neatness of Pattern;
The Principle of Economy.

As initial research into British Sign Language proceeded with the intention of developing a notation system for describing the language and providing mostly phonological descriptions, formalist approaches provided a suitable framework for notating and analysing its phonemic parameters, such as the structural minimalist pairs analysis carried out by Brennan et al. (1984) and the syntactic variation study undertaken by Deuchar (1981). In Deuchar's subsequent work, she notes the implications of this situation:

> Because of the lack of knowledge about the linguistic structure of the language as a whole, phonological analysis has also taken place almost without reference to the grammar of the language relying, as did the classical phonemicists, on the 'raw phonetic data', or visible activity alone.

(Deuchar, 1984: 53)

### 3.1.2 Transformational generative grammar

Later research into the syntax of British Sign Language, such as Deuchar's study of word order (1983) and of British Sign Language grammar (1984) was influenced by the transformational generative grammar framework that was introduced to the field of syntax by Noam Chomsky (1957) as a response to the previous classical phonemic approaches employed. In defence of phonemic theory, Ngar-Fun (1994) details the different purposes served by the two theoretical approaches, positing phonemic analysis as "a practical tool for describing the relationship between the sounds of a language and its meaning" and generative grammar as "a theoretical construct to explain how the sound system of a language operates" (p.39). However, Chomsky's (1965: 91) attack on what he refers to as
the "taxonomic phonemics" of structuralist linguistics proposed that their approach did not account for syntactic phenomena and offered analysis based on discovering a set of rules that could generate all the sentences of a language. In Derwing's (1974) study of contemporary linguistic theories, he asserts that "the generative syntactician prefers that syntactic analysis which manages to interrelate the greater number of syntactic (surface) structures by general syntactic rule (so increasing the 'explanatory powers' of the theory)" (p. 156) and defines the principles that generative syntacticians account for:
(1a) grammaticality (Does the sentence belong to the language?);
(2) ambiguity or 'constructional homonymity' (Can the sentence be analyzed in more than one way?);
(3) synonymy or 'para-phrase' (Can two different sentences be analyzed in the same way?);
(4) anomaly (Is the sentence 'odd', 'peculiar', 'paradoxical' or 'bizarre'?)
(Derwing: 1974: 160)

This set of principles is clearly theoretically and practically different from the principles that classical phonemic theorists followed (discussed in section 3.1.1 above) and illustrates how the difference in research perspective that one or other preferred theoretical background employs can change the focus of analysis.

The basis for this paradigm shift was the new notion that humans are born with an innate capacity for acquiring language, which Chomsky describes as a Language Acquisition Device (1965). Transformational generative grammarians introduced a method of analysis and research model more in keeping with the nativist and cognitivist models of society that were being explored in the sociological, psychological and philosophical disciplines at the time. This is far removed from the previous behaviourist-based perspective, influenced mainly by behaviourist psychologists, such as Skinner (1957), which had underpinned structuralist analyses and saw language acquisition as an external faculty and the result of conditioning and nurture. Al-thwary (2009) considers this change as "a revolution from the empirical, data-based structural description to a rational and mentalist approach to the study of language." Considering this move to a different framework, Al-thwary illustrates the consequences for linguistic analysis:

The discovery procedures used by structuralists...is not grammar; it is a kind of analysis that concerns with the surface structure of the sentences rather than their deep structure. It doesn't account for the degree of grammaticality and acceptability; nor does it stop the generation of ungrammatical utterances. It doesn't also include the idea of creativity...Discovery procedures also ignore linguistic universals and native speakers' intuition and his competence of generating infinite number of sentences out of a finite set of items. Chomskyan Syntax, on the other hand, provides a set of rules...Such rules are able to manipulate most of, if not all, the problems mentioned above. They are precise, explicit, highly formalized, predictive and projective. They generate mainly the deep structure.
(Al-thwarty, 2009: 12)

The linguistic phenomena accounted for by generative grammarians rely, then, on the intuitions of native speakers for a method of analysis and Derwing (1974: 160) expresses concern for this approach. Derwing asks: "What is central or especially significant about the particular range of phenomena described?" and states that "it is also difficult to imagine how the study of such 'intuitions' alone could lead to significant advances in our understanding of speech production and perception...the central considerations". In fact, the nativist approach to the study of language put forward by Chomsky (1957; 1965) and promoted in successive works, such as Pinker's (1995) Language Instinct, has been criticised, such as in Sampson's (2005) The 'Language Instinct' Debate. Sampson challenges nativists, contending that "their account of speakers' internal mechanisms do not offer a good match to speakers' observed linguistic behaviour" (p. 22). Sampson proposes a cultural basis for language knowledge, stating that "the languages that all human societies possess are cultural developments" (p. 4), resulting from experience.

### 3.1.3 Functional approaches

Continued discontentment with the context-free theory of syntax that generative grammar afforded has led to the continuation of a further theoretical approach, functional linguistics. This approach attempts to explain language structures according to the external functions by which they are driven. Its main proponent, Dik (1987), proposes a functional-based
grammar to fulfil the requirements of functional linguistics and refers explicitly to the principles by which functional linguists carry out analysis:

Semantic functions (Agent, Goal, Recipient, etc.), which define the roles that participants play in states of affairs, as determined by predications;

Syntactic functions (Subject and Object), which define different perspectives through which states of affairs are presented in linguistic expressions;

Pragmatic functions (Theme and Tail, Topic and Focus), which define the informational states of constituents of linguistic expressions as used in given settings.
(Dik, 1987: 41)
We have seen in earlier sections of this chapter that formalist theories of grammar tend to account for the rules or formal operations of a language and this is contrasted here with functional theories of grammar. The functional linguist attempts to examine the communicative context of a language and analyses its structures in terms of the functions that they carry out, therefore demonstrating the functional relations between linguistic elements. Dik's (1978; 1997) Functional Grammar (FG) and Halliday's (1994) Systemic Functional Grammar (SFG) are just some of the products of the functional approach.

Compared to the principle interests of the classical phonemic structuralists and the generative nativists, this clearly shows the difference in focus that the varying approaches to linguistic analysis have taken during the development and progression of linguistic theories. This development is seen clearly in the rapidly increasing theoretical stance, one that is of particular interest to this thesis: cognitive linguistics. We have seen that formal linguists examine language in terms of the relationships within forms, independent of any external influence, while functionalists attempt to explain language structures in terms of external motivations, according to an empiricist standpoint. We now turn to the position taken by cognitive linguists.

### 3.1.4 Cognitive linguistics

Language is only the tip of a spectacular cognitive iceberg, and when we engage in any language activity, we draw unconsciously on vast cognitive resources, call up innumerable models and frames, set up multiple connections, co-ordinate large arrays of information, and engage in creative mappings, transfers and elaborations.

The implications of this approach to understanding language and linguistics are also best understood with reference to the principles that guide analysis, in this case a set of three hypotheses that are laid out clearly by Croft and Cruse:

1. Language is not an autonomous cognitive faculty;
2. Grammar is conceptualization;
3. Knowledge of language emerges from language use.
(Croft and Cruse, 2009: 1)

Cognitive linguistics, then, is an attempt to view language as a conceptualization of experience and enables a top-down approach to linguistic analysis. While the bottom-up approach taken by formalists allows the necessary attention to patterns of form that a grammar must provide, it is crucial to consider the interaction between this approach and the top-down perspective that a cognitive understanding of language enables. Goldberg (1995: 24) benefitted from the inclusion of both "simultaneous mechanisms" in her analysis of argument structure in order to apply an interactive level of analysis. Before this chapter describes the method of analysis used to examine the syntax of British Sign Language, it is beneficial to provide some further theoretical information about this cognitive approach to understanding language (e.g. Slobin, 1996a). It is because linguistic expressions are understood as the encoding of experience via a process of conceptualization that utterances are referred to as 'constructions'. Alongside this concept is the notion of 'construal' (Langacker, 1987a; 1991) that is central to this analytical approach. Croft and Cruse's (2009) detailed account of conceptualization and construal operations notes that, according to the cognitive linguist, words and sentences do not contain internal meanings themselves; rather, meanings are 'construed' cognitively. Construal, then, is the process by which a language user views an utterance and structures a scene from a certain perspective (Langacker, 2008), a process by which "the choice of words and syntactic structures reflects a conceptualization or construal of the experience being communicated by the speaker" (Croft and Wood: 2000: 52). This cognitive appreciation of meaning is clearly described by Bokun:

In the dynamic construal approach, words do not have meanings permanently assigned to them; meanings emerge in actual use as a result of various processes of construal (mental processes of meaning construction). What every word does have as a permanent property is a mapping onto a body of conceptual content (purport) which is an essential part of the raw material for the construal processes.
(Bokun, 2005: 1)

The conceptualization processes are aptly referred to as construal operations (Croft and Cruse, 2009: 40) and reflect "the basic hypothesis of cognitive linguistics that language is an instance of general cognitive abilities" (p. 45). Hartmann and Player (2012) suggest that "analyzing construal operations in language offers us a window to cognition", hence the relevance for this research. At large, construal operations that are considered central to language processing are classified under four cognitive abilities: attention - including the ability to shift the focus, scope and scale of attention on a consciousness level; judgment involving the ability to categorize, understand metaphoric associations and specify contrasting relations by a process of comparison; perspective - the ability to locate and situate entities relatively; and constitution - including the ability to structure and represent experiences relationally (pp. 46-69). Naturally, these abilities apply in the cognitive functioning of hearing and deaf people and many earlier studies have claimed that signed language and spoken language processing makes use of these same 'higher organizing principles' (Brentari, 1998; Emmorey, 2002). Along with many other cognitive processes, and known under the umbrella term "executive function" (Hauser, Lukomski and Hillman, 2008), cognitive abilities are affected by both physical development in the brain and by life experiences. Hauser et al. (ibid.: 289) report that a child's "language environment" and "language practices" are important for the development of executive function. It is in this respect, however, that the functioning of Deaf and hearing people may differ and empirical research has encouraged an understanding of the difference in being, and in interacting, that auditory deprivation brings about, as the next section illustrates.

### 3.2 Cognition and the Deaf mind

The cognitive functioning, both linguistic and non-linguistic, of Deaf sign language users is an issue that has been subject to much research and discussion, including attention to domains such as concept application (Furth, 1964); classification (Best and Roberts, 1976); spatial reasoning (Parasnis and Long, 1979); memory (Meadow, 1980); theory of mind (Woolfe, Want and Siegal, 2002; Courtin, Melot and Corroyer, 2008) (and see Power and Leigh, 2005; and Moores and Martin, 2006 for full reviews). As this study very briefly examines the notion of cognitive differences between Deaf and hearing people, it is mindful of the hesitancy that often comes with findings of this nature. It suffices here to note Hauser and Marschark's (2008) view of past research, that suggestions that "deaf children differ from hearing children in more ways than just hearing thresholds and dependence of vision were greeted with considerable ambivalence, if not of not outright indignation" and "banished from the research agenda" (P. 441). In a study of the psychological make-up of Deaf people in the USA, Emmorey (1998) found that Deaf and hearing people function similarly on a higher cognitive level but claim that differences do appear in the processing and articulation of language (also Talmy, 2007; Atkinson, Marshall, Woll and Thacker, 2005). Similarly, a study of the neural systems responsible for language processing in 2002 found both "modality-independent" and "modality-dependent" brain activation patterns:

In relation to modality-independent patterns, regions activated by both BSL in deaf signers and by spoken English in hearing non-signers included inferior prefrontal regions bilaterally (including Broca's area) and superior temporal regions bilaterally (including Wernicke's area). Lateralization patterns were similar for the two languages...In relation to modality-specific patterns, audio-visual speech in hearing subjects generated greater activation in the primary and secondary auditory cortices than BSL in deaf signers, whereas BSL generated enhanced activation in the posterior occipito-temporal regions (V5), reflecting the greater movement component of BSL.
(MacSweeney, Woll, Campbell, McGuire, David, Williams, Suckling, Calvert and Brammer, 2002: 1075)

Bellugi, Poizner and Klima (1993) conducted similar analysis of ASL, finding that "ASL shares underlying principles of organization with spoken languages, but the physical realization of those principles occurs in formal devices arising out of the very different possibilities of the visual-gestural mode" (p. 404). This notion is expanded in Talmy's (2003) description of a "core linguistic system" shared by signed and spoken languages and a related subsystem that accounts for the differences:

Spoken language and signed language are both based on some more limited core linguistic system responsible for their commonalities. This system then further connects with different neural subsystems for the full functioning of the two different language modalities.
(Talmy, 2003: 209)

The neural subsystems count for the differences between signed and spoken languages, at the level of structure and organisation:

What has here been found is that two different linguistic systems, the spoken and the signed, both of them undeniably forms of human language, share extensive similarities but -crucially- also exhibit substantial differences in structure and organization. A new neural model can be proposed that is sensitive to this finding. We can posit a "core" language system in the brain, more limited in scope than the Fodor-Chomsky module, that is responsible for the properties and performs the functions found to be in common across both the spoken and the signed modalities. In representing at least spatial structure, this core system would then further connect with two different, outside brain systems responsible, respectively, for the properties and functions specific to each of the two language modalities.
(Talmy, 2003: 240-241)

As current research continues to explore the levels at which signed and spoken languages organise differently, and the extent to which the cognitive functioning of Deaf and hearing people diverts (Marschark, Lang and Albertini, 2002; Marschark, 2003), there remains an acceptance at least of the visuality by which Deaf people function, i.e. the 'visuospatial cognitive processes' (Emmorey, 2002). It is the instinctive recall to visual detail and the visual view of the world that drives Deaf culture and is at the centre of Ladd's (2003) notion of 'Deafhood': the claim that the visual nature of Deaf people results in a shared sense of identity and being, and hence a Deaf community. It must of course be acknowledged that cultural differences among Deaf communities across the globe exist due to the vastly
differing social and political situations that Deaf people experience. Smith and SuttonSpence (2007), for example, illustrate the differences between British and American 'Deaflore' (i.e. Folklore that is particular to Deaf people's experiences and traditionally told and passed down in Deaf communities through signed poetry, jokes, story-telling, personal narratives, etc.). However, there still remains the shared global Deaf identity that has come to be known as the Deaf Nation (Bahan, 1997) and Deaf Way (Ladd, 2003), and De Clerck's (2007: 12) research has raised direct consciousness of "a shared experience of being deaf in a world that is hearing": a Deaf way of being, of knowing, and of learning. While mindful of local "indigenous ways of deaf learning", De Clerck (2010) proposes that "similarities in deaf epistemologies suggest global learning strategies of visually oriented and signing people" (p. 442). This globalization of Deaf experiences is also perceived to be inherent in signed languages, for example, Fusellier-Souza's (2006) semiogenetic model suggests that the "inherent iconicity of signed languages is regarded as a foundational and organizational principle" (p.30).

Marschark's (2005) discussion of the visual language and thought interplay leads to questioning how "the use of visuospatial language might influence social, language and cognitive functioning" (p. 464) (also Marschark, Siple, Lillo-Martin, Campbell and Everhart, 1997). The extent to which language structures inform or reflect cognitive functioning, or exhibit an interconnection relationship, is by no means a new concept in the field of linguistics, reaching even further back than the most commonly discussed $19^{\text {th }}$ century believers in linguistic influence, e.g. von Homboldt (cited in Lee, 1996: 45). The 'principle of linguistic relativity' associated with Benjamin Lee Whorf (ibid.) expanded the notion that language informs thought and experience, and has been the subject of much linguistic inquiry and many scholars have examined the interface of language and thought, including Lakoff in his neural theory of language (in Dodge and Lakoff, 2005), which proposes, alternatively, that linguistic structure reflects brain structure. This relation has culminated in the current interest in cognitive linguistics in "the relationship between human language, the mind and socio-physical experience (Evans, Bergen and Zinken, 2007). In the pioneering volume of edited works on 'Deaf Cognition' (2008), Pisoni, Conway, Kronenberg, Horn, Karpicke and Henning's discussion of cochlear implants relies on a view of speech and language as "embodied processes linking brain, body and world together as an integrated system" (p.94). In the same volume, the cognitive differences between deaf and hearing people are demonstrated explicitly. For example, Marschark and Hauser state that differences in the language environment and social experiences
affect cognition; Marschark and Wauters found that deaf students "employ different cognitive strategies in learning and memory tasks" (p. 311). Of more importance to this research are the differences in visual perception and attention noted by Dye, Hauser and Bavelier:
"...studies using homogenous samples of deaf native signers have demonstrated changes in visual function that could be considered more adaptive, in that they show a compensation in the visual modality for the lack of auditory input. In such individuals, a selective enhancement for stimuli that are peripheral or in motion and require attentional selection has been demonstrated".
(Dye, Hauser and Bavelier, 2008: 254)

This difference is emphasized in the concluding chapter, where Hauser and Marschark note that deaf people are not the same as hearing people "socially, adaptively or cognitively. Instead they are living and functioning in a world that is different from their own" (p. 450).

It has been noted already, in section 2.3 of this thesis, that a psycholinguistic approach to understanding the grammar of British Sign Language has not been taken despite Kyle's suggestion in 1983 that a top-down analysis is appropriate for this language. Hopefully, future research will determine the extent to which the visuospatial cognitive processes of Deaf people drive the syntax of signed languages. The interest in this theoretical approach for this research project is driven by the intention of this study to begin to understand the cognitive motivations for language structures (Janzen, 2006) and the suitability of particular syntactic operations for this language. A theoretical framework that enables a holistic analysis, such as the 'boxes within boxes' notation presented in the next section, allows this research to consider, at least to some extent, the cognitive motivations underpinning language use, bearing in mind the conceptual notions fundamental to the analysis:

Language is in the service of constructing and communicating meaning, and it is for the linguist and cognitive scientist a window into the mind. Seeing through that window, however, is not obvious. Deep features of our thinking, cognitive processes, and social communication need to be brought in, correlated and associated with their linguistic manifestations.
(Fauconier, 1999: 96)

### 3.3 Methodology

### 3.3.1 Construction Grammar

This thesis adopts a cognitive understanding of meaning and of language, as previous sections have stated. The most effective method for analysing the syntax of BSL is therefore one that enables the research to explore the way that conceptualisations of meaning (see section 3.1.4) are reflected in the language structures. Construction Grammar (CG) regards linguistic units as "particular associations between form and meaning that must be represented as such, rather than leaving such associations to the operation of a set of rules for how to combine individual forms" (Fillmore, 1988: 12). According to Fillmore (ibid.), CG frameworks adopt the following hypothesis:
(i) speakers rely on relatively complex meaning-form patterns - constructions - for building linguistic expressions; (ii) linguistic expressions reflect the effects of interaction between constructions and the linguistic material, such as words, which occur in them; and (iii) constructions are organized into networks of overlapping patterns related through shared properties.
(Fillmore, 1988: 12)

The mainstay of this framework is that linguistic elements are not separated into disconnected features; rather, linguistic elements combine to enable the expression of meaning as a cohesive unit: a construction (Kay and Fillmore, 1999; Ostman and Fried, 2005). Wilcox (2004) proposes a cognitive approach to the study of sign languages:

Since signed languages are produced by hands moving in space and time and perceived visually, the same theoretical constructs that are used to describe semantic structures can describe the hands as objects of conceptualization within a linguistic system.
(Wilcox, 2004: 124-125)

This orientation has been found suitable for the study of other sign languages, such as ASL, where Liddell (2003) applies the notion that "grammatical representations...are composed of a pairing of form and meaning" (p.62) and proposes, for example, that cognitive grammar approaches provide a strategy for analysis when the semantic component of a grammar does not always have a syntactic representation. Liddell found
that certain transitive verbs, such as verbs marked for aspect, do not permit an overt object to be placed after the verb, regardless of its transitive nature ${ }^{1}$ : "...these are verbs that are semantically transitive but syntactically intransitive". Liddell's example of the durational form of the transitive verb EAT illustrates this point:
(2a) GIRL EAT TOMATO
The girl ate a tomato.
*GIRL EAT ${ }^{(\text {DURATIONAL })}$ TOMATO
The girl was eating tomatoes for a long time.

(Liddell, 2003: 62)

A framework such as CG, then, is deemed appropriate for this study because it allows the research to consider the relationship between form-meaning pairing at a constructional level. As there is relatively little research previous to draw on, and sign linguists are still in the process of establishing sign types, defining verbal categories presents difficulty. In defining the categories, it is relevant to note that the visual modality that enables a high level of productivity and sequentiality, often results in a relationship between form and meaning that is cognitively iconic and systematic (Wilcox, 2004); where the relationship is less iconic, the correlation between form and meaning is more conventionalised and signs are more lexicalised. To this extent, the description of verb types presented in Figure 11 in section 2.3 is a continuum and is illustrated in the following examples, which help to define the categories. At the fully lexical end of the lexicalisation continuum, the relation between form and meaning is "highly conventionalised" (Johnston, 2013). For example, in the following noun sign, there is no iconic relationship between form and meaning and the addressee relies on convention in order for its meaning to be construed:
(3)

(corpus reference: BL13n)

[^0]At the intermediate level (i.e. partly-lexical signs) signs are less conventionalised and are therefore highly contextual. Johnston (2012: 166) explains that "partly lexical signs do not have associated with them in any usage event a meaning that is additional to or unpredictable from the value of those components given the context of the usage event", highlighting the contextual nature of the signs. For example:
(4)


SLIDE
(corpus reference: BM15n)

At the non-lexical range (i.e. gestural signs) signs have no conventionalised pairing of form and meaning, rely heavily on context to be correctly interpreted. For example, the sign below requires context to be interpreted as an act of strangling, rather than an act of shaking a rounded object :
(5)


STRANGLE
(corpus reference: G14n)

It is at this level of the continuum, then, that sign languages exploit iconicity to its fullest and there is a systematic relationship between the form-meaning patterns (Gasser, 2004). As the type of verb sign used in any construction may have implications for the syntax, the distinctions among the sign types are clearly important for this study. This context is also used to provide a framework for the analysis of constructions that is broad enough to
enable research to work from data to theory (Slobin, 2008). In order to achieve this, CG makes use of 'boxes within boxes' notation (Fillmore, 1988). To indicate the analysis, the perimeter of an outer box contains information about the 'external' properties of a construction and enclosed, smaller boxes illustrate the construction's internal syntax (ibid.). This theory is expanded in Kay's (2002) sketch of Construction Grammar. Kay's example (6) of the construction Sid sat may help to illustrate this method:
(6)

"...the outer box represents the sentence as a constituent, the small, left-daughter box indicating the subject (Sid) constituent and the right-daughter box representing the predicate (sat) constituent. The feature structure enclosed only in the larger box, at the top, says that (1) syntactically we have a sentence, (2) semantically, (a) the frame (relation) is SITTING, (b) the unique argument is SIDNEY and (c) the tense is past, and (3) the phonology of the sentence is schematically represented as <sid sat>. The entries in each of the smaller, daughter, boxes can be read in the same way".
(Kay, 2002: 4)

### 3.3.2 Corpus-based research

In a recent discussion of methods used in the field of cognitive linguistics, Gries (2012) notes that this field makes use of various combinations of types of data, including introspective, observational and experimental elicitations. With regard to methodology used in the research of signed languages, it is relevant to note that Deuchar (1983) found that researchers who use elicited sentences tend to find subject-verb-object (SVO) structures, whereas research that makes use of recordings of spontaneous signing claim that most known signed languages encompass a wider range of structures. As BSL exists in persistent contact with the surrounding language, English, many of its language users are bilingual to some extent and may incorporate aspects of both languages into their production due to the physical ability to superimpose aspects of English onto BSL use (see section 1.2). Given this, elicitation exercises are also likely to result in data collection influenced by some level of this superimposition. Moreover, Johnston (2013: 3) reminds us of the "long canvassed questions about the nature of evidence in linguistics and the limits to and reliability of intuition, introspection, and the elicitation of grammaticality judgements". Given the language status of BSL portrayed in section 1.1, and the nature of this study being to analyse the syntactic operations and processes of BSL, it was decided that elicitation activities would not be used as part of this research process. Instead, observations of a corpus comprise the research activity, enabling an inductive approach. Johnston (ibid.: 4) describes the central aim of sign language corpus linguistics as "to empirically ground SL description in usage in order to validate previous research and generate new observations". The purpose of the inductive methodology, facilitated by this corpus-based research, is stated clearly by Thomas:

The purposes for using an inductive approach are to (1) to condense extensive and varied raw text data into a brief, summary format; (2) to establish clear links between the research objectives and the summary findings derived from the raw data and (3) to develop a model or theory about the underlying structure of experiences or processes which are evident in the raw data. The inductive approach reflects frequently reported patterns used in qualitative data analysis.
(Thomas, 2003)

A corpus, then, provides the relevant level of spontaneous and abundant data that other research activities cannot easily source, and that are particularly suitable to an inductive approach. As Marschark (1993) suggests, "a sufficiently rich corpus provides a good working model of the structure of the language and to a more remote degree of the knowledge of the language user" (p. 74). One of the benefits of a corpus that Meyer discusses is that "frequently occurring grammatical constructions can be reliably studied in relatively small corpora" ( p .13 ) and it is this descriptive level of analysis that this research seeks to achieve.

With regard to signed languages, the first corpus (of Australian Sign Language Auslan) appeared only recently, in 2008, a year after Johnston and Schembri's introductory text to Auslan (2007) and the compilation of a lexical database of Auslan, Signbank. Corpora projects for many other signed languages shortly followed, and this sudden emergence of sign language corpora is partly due to the advances in computer and video technology that have made recording and storage of sign language clips, and search facilities possible. The Sign Language Corpora Survey currently being conducted in Germany (DGS-Corpora, 2012) lists 17 ongoing or completed sign language corpora/dictionaries up until June 2012 for the following sign languages: German, SwissGerman, Dutch, British, French, Spanish, Danish, Irish, Icelandic, American, New Zealand, Korean, Mali, Kata Kolok, Swedish and Australian, plus a dictionary of Auslan. There are now also mini-corpora available, such as the ECHO (European Cultural Heritage Online) data set of British, Dutch and Swedish Sign Language (Woll, Sutton-Spence and Waters, 2004). Sign Language corpora, then, are fast developing across the globe, aiding the vital documentation of sign languages and offering the ability to study samples of native language use akin to spoken language corpora.

### 3.3.2.1 The BSL Corpus

The corpus used for the purpose of examining the syntax of BSL in this research is the BSL Corpus, and all data samples used in this thesis were collected for the British Sign Language Corpus Project (BSLCP) held at University College London (UCL). The corpus is funded by the Economic and Social Research Council UK (RES-620-28-6001), and supplied by the CAVA Repository; the data are copyright (Schembri, Fenlon, Rentelis \& Cormier, 2011). CAVA - A Human Communication Audio-Visual Archive - is a project that was established by a UCL Research Challenges grant with the main aim of collating a
repository of both spoken and signed human communication data. The CAVA currently comprises a digital collection of archived data stored within UCL's Library Services. A direct URL link leads to the project's home page (see Figure 3 below):

```
UCL LIBRARY SERVIGES
CAVA Repository

Search - Advanced search - Browse by project - Browse by condition
```

Enter search term(s):
Record: }\quad\mp@subsup{O}{\mathrm{ Contains }}{}\mp@subsup{\textrm{O}}{\mathrm{ Exact }}{}\mp@subsup{\textrm{O}}{\mathrm{ Starts With}}{
Search

```
CAVA Repository

The CAVA (human Communication: an Audio-Visual Archive) repository contains rights-cleared primary audio and video recordings made by UCL's human communication researchers and their associates.
    SEARCH for a specific term, for example "Sensori-neura/ bilateral hearing loss", or
    BROWSE the collection by project, condition, age or education.
In order to view any files, you will need to register. Information on how to
join can be found here. Please log in using the links below
    UCL users: Log in here
    - External users: Log in here

For more information, follow the links below.
- A video tour of the archive, via our YouTube channel:


Figure 3-1 The CAVA Repository - home page
(Moyle, Beeke, Mahon and Mahon, 2010 - http://www.ucl.ac.uk/library/cava)

The project proceeded with the benefit to the research community in mind:

In order to investigate human communication and interaction, researchers need hours of audio-visual data, sometimes recorded over periods of months or years. The process of collecting, cataloguing and transcribing such valuable data is timeconsuming and expensive. Once it has been collected, its value to the research community can be maximised by re-use...The CAVA project was designed to support the premise that researchers in human communication might be able to
save time and money and improve the depth of their observations and conclusions by reusing existing data.
(Moyle, Beeke, Mahon and Mahon, 2010)

Once the repository is accessed, search options lead to the British Sign Language Corpus Project section (see Figure 4 below).


Figure 3-2 The CAVA British Sign Language Corpus Project - home page
(Moyle, Beeke, Mahon and Mahon, 2010 - http://www.ucl.ac.uk/library/cava)

The BSLCP project team state that the main motivations for compiling and storing the corpus are because "the language is changing rapidly due to changes in the Deaf community, so it is important that we have a record for the future" and also because "it will directly lead to an improved understanding of BSL structure and use...This information is important for the education of Deaf children, for training sign language interpreters, and for BSL teachers" (BSL Corpus Project, 2013). It is the latter part of this motivation that is of interest to this research: analysis of the structure of BSL and its applied use.

The CAVA BSLCP corpus operates on two levels of access: Open Access comprising narratives and a lexical elicitation exercise that are available for public viewing; Restricted Access, containing interviews, conversations and some combined narratives followed by conversations, where viewing is restricted to researchers who are registered for an End User Licence. The corpus comprises video clips of filming of 249 Deaf people who mostly acquired BSL before the age of 7 and are from a selection of 8 cities across the UK (see section 3.3.2.2 for further details). Participants were selected for a mix of age, gender, family background, employment status and ethnic background and a local Deaf fieldworker recorded the participants, in pairs, partaking in the interviews, conversations, relaying narratives of personal experience and lexical elicitation exercises. Prior to data collection for the corpus, all participants completed a consent form (see Appendix 2), which is particularly important in sign language data collection, as each participant is clearly identifiable from the video files. Ethical approval for participation in the corpus was obtained from UCL's Ethics Committee, where specific attention was paid to confidentiality and anonymity. The final BSLCP project report explains that specific people and groups from within the Deaf community were often named during the interview task, raising an ethical issue; this was resolved by placing the interview data under the Restricted Access band and requiring the End User Licence, which includes a confidentiality agreement (Moyle et al., 2012). The BSLCP section of CAVA contains search functions, and search results lead to a view of brief metadata descriptions of samples (see Figure 5 below).


Figure 3-3 The CAVA Repository - search results
(Moyle, Beeke, Mahon and Mahon, 2010 - http://www.ucl.ac.uk/library/cava)
These results can be expanded to show the full metadata record (see Figure 6 below):


Figure 3-4 The CAVA Repository - full metadata record
(Moyle, Beeke, Mahon and Mahon, 2010 - http://www.ucl.ac.uk/library/cava)

One of the central aims of the BSL corpus project, which ran from 2008-2011, was to compile "a collection, on the internet, of video clips showing Deaf people using BSL, together with background information about the signers and written descriptions of the signing in ELAN" (BSLCP, 2013). The use of ELAN digital video annotation software is quite usual for researching sign languages, as it enables the precise time alignment of video clips to corresponding annotations and translations that are added on parent and daughter tiers below the signed clip. These corresponding annotations can occur at varying levels of detail, including tiers that identify the grammatical class of overt manual signs and of non-manual features. The annotation tiers create machine-readable text and ELAN is able to search across multiple annotation files to produce, for example, frequency statistics for annotations (Johnston, 2013). At the end of the BSLCP project, the dataset consisted of video clips only and the building of the corpus annotations, while it has begun for some of the conversation data, will take many years to establish due to the enormity of the process involved (see Johnston's (2013) annotation guidelines for a comprehensive description of corpus-building).

\subsection*{3.3.2.2 The data}

In order to maintain as high a level of representativeness as possible, the data available in the BSL corpus was subject to intentional selection before the analysis began, and after securing an End User Licence to facilitate access to the restricted, as well as the open, data. This initiative was taken in order to avoid random sampling and allow analysis of specifically chosen tokens. Bearing in mind the importance of analysing the most spontaneous data for this study, the first selection was made in the research 'activity' category of the corpus. From the options available: [interviews, paired conversations, paired narratives, lexical elicitation exercises] the interviews and lexical elicitation exercises were eliminated immediately for the reasons described in sections 1.2 and 3.3.2. A decision was taken to also eliminate the conversations, as the constant and rapid exchange of discourse in this genre may restrict the amount of transitivity used (Thompson and Hopper, 2001). The paired narratives were therefore selected for observation. In light of the fact that the least influenced use of BSL is seen in its native users (i.e. people who acquire the language naturally from parents who use BSL and pass it down across the generations), the 'age of BSL acquisition' category was perused next. From the options available: [ \(<7\) native signer, \(<7,8-12\) ] only the ‘ \(<7\) native signer' tokens were selected for analysis (apart from in Glasgow, where no ' \(<7\) native signer' narrative tokens were
available so tokens were selected from the \(<7\) range). In the category of 'region', tokens from all 8 available regions were chosen: [Belfast, Birmingham, Bristol, Cardiff, Glasgow, London, Manchester and Newcastle]. With regards to the remaining demographic factors, the Full Metadata Records (see Appendix 1 for an example of a Full Metadata Record) for the selected tokens indicate an appropriate mix of gender and age (see Figure 7 below); all of the people chosen acquired BSL within the family from birth or at a very young age and most of the participants attended specialist schools for deaf children at both primary and secondary levels. Given the low percentage of native users in the narrative section of the corpus, 2 samples of narratives (conducted in pairs) from each of the 8 regions were selected, resulting in 16 clips. Each of the contributors in the pairs takes a turn to relay a narrative of an experience they have had to their partner and these individual contributions last for approximately 5 minutes per contributor. As some contributions are longer than expected, the total time of the data analysed is 2 hours and 2 minutes.
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & 16-19 & 20-40 & 41-65 & 65+ & male & female \\
\hline Bristol & & 2 & 2 & & 1 & 3 \\
\hline Birmingham & 2 & & 2 & & 3 & 1 \\
\hline Cardiff & & 2 & & 2 & 4 & \\
\hline London & & 3 & 1 & & & 4 \\
\hline Manchester & & 2 & 2 & & 2 & 2 \\
\hline Newcastle & & 1 & 3 & & 1 & 3 \\
\hline Belfast & 2 & 2 & & & 3 & 1 \\
\hline Glasgow & & & 3 & 1 & 2 & 2 \\
\hline Totals & 4 & 12 & 13 & 3 & 16 & 16 \\
\hline
\end{tabular}

Figure 3-5 Distribution of age-range and gender of selected tokens

\section*{4 Chapter Four - Data Presentation and Analysis}

\subsection*{4.1 Data access and presentation}

As the previous chapter stated, the BSL corpus contains video files recorded in British Sign Language. As the corpus does not yet contain annotations or translations for the signed narratives used in this study, hence no facility to conduct machine-readable data searching, it was first necessary to gloss the selected video clips in order to present examples in the thesis. The purpose of the glossing was to assist the analysis of the raw signed data and to enable presentation of samples of the data in written form in box-withinbox format in the next chapter. It was noted in section 1.2 that glossing may not lead to complete recovery of the source text. In the absence of a more effective way to present the signed data in written text, attempts have been made to recover as much manual and non-manual detail as possible in order to identify linguistic units above the level of the individual sign. Glosses are arranged in the format of 3 tiers, which are subject-specific and suited to syntactic analysis (see Appendix 3).

Tier 1: Non-manual features
As this study does not permit time and space for the comprehensive notation of all nonmanual behaviour, there is no dedicated tier for each individual non-manual feature. The purpose of this tier, for this study, is to make note of non-manual behaviours that occur as a modification of the important inherent non-manual features that accompany articulation.

The following descriptions, and diacritic line indicating the spread of the features, are used for the purposes of glossing:

\begin{tabular}{ll}
\(>\) & pc \\
\(>\) & indicates the use of puffed cheeks
\end{tabular}

Tier 2: Lexical signs
This tier contains capitalised words that represent the nearest English word-equivalent to the sign and signifies the basic citation form (i.e. "the base form, before any extra grammatical information has been added" - Sutton-Spence and Woll, 1999), unless relevant diacritics are added (see below). For the sake of brevity, lemmatisation (Johnston, 2012) is used for forms of the same lexeme (e.g. GO, GONE and WENT are lemmatised as GO, and where various forms contain the same meaning but mouthing differences (e.g. SEE, LOOK and WATCH are lemmatised as LOOK). The following descriptions, and relevant diacritics, are used and are discussed in more detail in the next chapter:
\begin{tabular}{ll}
\(>\) WORD-WORD & indicates that more than one word refers to a single sign \\
\(>\) w-o-r-d & indicates the fingerspelling of a sign \\
\(>\) WORD++ & indicates the repetition of a sign \\
\(>\) ix \((2 ; 3)\) & indicates use of pointing (you; he/she/it etc.) \\
\(>\) NS & indicates the use of a name-sign \\
\(>\ldots ?\) & indicates an indecipherable sign/phrase
\end{tabular}

Tier 3: Predicate + Argument structure
In line with the aims of this research study, the third tier marks the positioning of the verbal predicate \((\mathrm{V})\) subject \((\mathrm{S})\), object \((\mathrm{O})\) in each clause. The traditional single forward slash clause boundaries / and double forward slash sentence boundaries // are used, and embedded sentences are also marked in the usual way, with square brackets [ ] indicating the container clause and the contained elements. Simultaneous articulation is indicated by curly brackets \{ \} and N/O indicates a clause where the predicate is non-overt.

\subsection*{4.2 Data analysis}

Having glossed all of the selected corpus files for observation, the next task was to decide on a system for coding the data. Lampert and Ervin-Tripp's (1993) discussion of coding is helpful here:

\begin{abstract}
The classification and labelling of natural events into discrete categories is a central part of most research in the social sciences. It allows investigators to identify and group similar instances of a phenomenon together for systematic study...coding frequently requires the development of a highly structured and hierarchical system that can be used not only to relate variables to one another, but also to generate and test hypothesis.
\end{abstract}
(Lampert and Ervin-Tripp, 1993: 169-170)

This process of classification and labelling, according to Lampert and Ervin-Tripp, includes identifying the information that is to be recovered and selecting codes to represent that information. This involves "four fundamental and interrelated steps in the coding process: construction, implementation, evaluation, and application" (ibid.). This study makes use of this coding process in the analysis of BSL syntax and the following sections are based on Lampert and Ervin-Tripp's model.

\subsection*{4.2.1 Construction}

The construction process involves the data being segmented into basic units of analysis followed by description of the data via coding categories. Segmentation of sign language discourse is no easy task, partly due to the simultaneous constructions and overlapping of complex structures (Crasborn, 2008). To this extent, it was decided to identify clause units as the basic units of analysis. Given the absence of any comprehensive description of clause units in BSL, the segmented units are based on those already established as 'Clause-Like Units (CLUs)' by Johnston and Schembri (2007). Hodge, Ferrara and Johnston (2011) define a Clause-Like Unit (CLU) as "a possible language-specific grammatical construction containing a universal semantic structure" (emphasis theirs) and this is a useful concept for this research until further, more in-depth study has taken place. In the meantime, this study takes note of Johnston's (2013) guidelines for the separation of CLUs provided in the form of Auslan Corpus Annotation Guidelines:

Identifying clause unit level grammatical organization involves identifying features of CLUs as a whole unit, e.g., whether they exhibit some identifiable overt structural or formal characteristic that expresses or encodes the type relationship they have with each other.
(Johnston, 2013: 65)

For Hodge, et al., this includes paying attention to features that make up prosodic contours and these features are taken into account in this research. They include changes in:
- Duration (> 2 sec )
- Eye gaze pattern
- Head/torso momentum
- Tensity of hands
- Sign holds (> . 3 sec )
- Pausing (> . 3 sec )
- Head tilt + eye closure
- Body 're-set' (return to 'neutral' position)

It is necessary to proceed with caution, however, when relying on prosodic features such as those listed above for segmentation. Ormel and Crasborn (2012: 280-281) note that "prosody is not a direct expression of syntactic structure", though they do suggest that there is evidence for "larger prosodic domains that can be equated with a syntactic unit" and this research proceeded to this intent. A study of sentence boundaries in BSL carried out by Fenlon, Denmark, Campbell and Woll (2008), in fact, indicates that a visual cuebased approach may be appropriate for signed narratives, particularly of pauses, blinks and head-nods.

In order to examine relationships between clauses, coordinated vs. subordinated relationships are analysed. Here, the subordinate clause is viewed as grammatically dependent on another clause and constitutes either an argument of the matrix clause (embedded), a modifier of a noun phrase within the matrix (embedded) or a modifier of the verb of the whole matrix clause (dependent). While this traditional, syntactic view of clause combining have been challenged in the literature, such as Matthiessen and Thompson (1988) and the contributions in Laury and Suzuki (2011), it is sufficient for the overview of inter-clause relationships in BSL presented in section 5.2.2. To this extent, CLUs that stand alone as a whole unit, and do not exhibit any structural or formal characteristic that
expresses a relationship with any surrounding CLUs, are identified as independent single clauses; where a CLU exhibits structural or formal characteristics that connects it to another CLU/s (such as the prosodic contours presented in section 4.2.1) and the connected CLUs could stand alone in a different context, the CLUs are identified as coordinated compound clauses. In cases where a CLU exhibits characteristics that connect it to another CLU and it cannot stand alone, it is identified as being subordinated. Where a subordinated CLU is classed as embedded, it serves to modify a constituent (or is a constituent) of the independent clause and is therefore functioning as an argument of the matrix clause and cannot stand alone. Where a subordinated CLU is classed as dependent, it also does not stand alone but is not embedded into a matrix CLU, that is, it does not modify the independent clause but it does depend on it in order to add extra information to it (also known as cosubordinate - Van Valin, 2011). Van Valin notes that this second type of subordination offers "strong evidence that dependence is not equivalent to embeddedness; rather, they are distinct parameters in defining syntactic relations in clause linkage" (p. 545). It is for this reason that embeddedness is separated from dependence in this study. In terms of grammatical organisation between CLUs, then, the following definitions apply:
- an independent sentence consists of a single CLU;
- a coordinated sentence consists of two or more compounded CLUs;
- a subordinated sentence consists of at least one single CLU and at least one embedded or dependent CLU.

With regards to the description of the relationships within CLUs, the data selected is labelled according to the existent categories used to mark syntactic relations in argumentstructure analysis (SVO). The traditional view of a sentence being comprised of a subject and a predicate is not applied here, as this does not facilitate the total description of predicates and arguments that is required in this descriptive analysis. This study views a grammatical clause as containing a core and a periphery, akin to Johnston's (2013) analysis for Auslan, where the predicate (usually verb/s) and its argument/s comprise the core, and adjuncts make up the periphery. Johnston notes the peripheral elements as "discourse markers, fixed expressions, some gestures and lexical and phrasal adverbials (of time, location, manner, etc.), which convey circumstantial information that qualifies in some way the basic state of affairs described in the clause" (p. 70).

\subsection*{4.2.2 Implementation}

The second step in Lampert and Ervin-Tripp's (1993) coding process involves organising the data into topics, and presenting the topic categories. Alongside the difficulty of segmenting basic units for analysis, the limited analysis of the syntactic processes of BSL also presents problems for coding data into organised topics. Advice from Slobin, Hoiting, Anthony, Biederman, Kuntze, Lindert, Pyers, Thumann and Weinberg (2001) includes using a system that is suitable for the coding of manual and non-manual features, and enables patterns in the data to be identified; coding that can "flow from the needs of each individual research project" (p. 65). In order to organise the samples selected for this research into topics suited to the description of clause constituents and to clause relationships, the study makes use of the classification of sub-sets of signs, described in detail in section 5.1.1, fully lexical (plain), partly lexical (indicating and depicting) and nonlexical (gestural) predicate constructions. Johnston (2012) informs us that the range and type of grammatical structures in Auslan has "yet to be rigorously tested" (p. 178) and the same is true for BSL. Therefore, assigning grammatical classes to sign language data is no easy task and goes hand in hand with the identification of clause structure, as Johnston (2013) notes:

Assigning grammatical class categories to individual signs cannot be done independently of context and 'clause structure'. In other words, it is only by positing a CLU and attempting to identify its constituents that one can have a basis for assigning a sign token to the category of noun, verb, adjective, adverb, etc. The process of CLU analysis and grammatical class assignment is interdependent.
(Johnston, 2013: 61)

The initial state of assigning grammatical classes therefore began with defining the verbal sign phrase and then detecting any overt subject and/or object constituents. Where it was difficult to categorise an element as an argument or an adjunct, particularly a prepositional phrase (PP), elements of the 'four-way classification task' proposed by Merlo and Esteve Ferrer (2006) is used (see Figure 8 below). This involves testing the element for 'optionality' (if the element is obligatory and removing it leads to ungrammatically, it is an Argument); 'iterativity and ordering' (if the element cannot be iterated and cannot follow
other arguments in a series of PPs, it is an Argument); 'head dependence' (if the element depends on its lexical head and is integral to the phrase, it is an Argument); 'extraction' (if stranding and pied-piping cannot separate the preposition from its head, it is an Argument). Merlo and Esteve Ferrer's example illustrates this useful method:
\(\left.\begin{array}{|ll|}\hline & \text { Americans will learn more about making products [ for the Soviets ]. } \\
\text { optionality } & \begin{array}{l}\text { Americans will learn more about making products. } \\
\text { order }\end{array} \\
\text { Americans will learn more about making products these coming years } \\
\text { for the Soviets. }\end{array}\right]\)\begin{tabular}{l} 
Americans will learn more about making/selling/reading products for \\
head dependence \\
extraction \\
\begin{tabular}{l} 
Who do you wonder whether Americans will learn more about making \\
products for? \\
For who(m) do you wonder whether Americans will learn more about \\
making products?
\end{tabular} \\
\hline
\end{tabular}

Figure 4-1 Four-way classification task
(Merlo and Esteve Ferrer, 2006: 357)

The greatest difficulty in assigning grammatical class is perhaps seen at the partly lexical level. Assigning indicating verbs to a category, for example, is raised by Liddell (2003) and Johnston (2012) states that depicting signs can be difficult to distinguish from gestures. In the case of this study, it was often difficult to assign articulations as gestural verb signs. For example, signs such as PUT-ON-COAT and MUNCH (7) appear to be of a gestural nature, as the relationship between form and meaning of the signs is not conventionalised and is highly contextual, but they also depict the size or shape of the direct object:


Fig...TAKE-OFF-COAT


Fig MUNCH (corpus reference: G14n)

The researcher also experienced difficulty in distinguishing some indicating verbs from depicting verb signs. For example, the sign BRUSH-TEETH clearly depicts the handling of the toothbrush (hence a depicting size and shape verb sign) but also indicates the location of the action; locating it at the side of the head and moving the sign downwards, for example, would construe the act of brushing hair instead (therefore an indicating verb). In cases such as this, the most significant or overriding factor was taken as an indicator of grammatical class, in this case the location of the action:
(8)


BRUSH
(corpus reference: G11n)

This type of analysis, in the main, was chosen because it enables the central research aim, to identify and describe a range of grammatical structures, to be achieved. This also enables the analysis to take immediately into account the predicate within each CLU and the arrangement of its arguments, and to examine the processes that relate clauses to each other. It was anticipated that this would also provide some insight into possible motivations for certain structures, enabling the third and fourth research questions to be explored. With regards to the presentation of topics, sample sentences taken from the analysed data illustrate the findings. These are presented in gloss form and then combined with boxes-within-boxes notations to provide an initial step to a constructional level of analysis for understanding the syntax of BSL. This level of analysis is used only for the examples chosen to illustrate clause constituents (section 5.2.1) and relationships between clauses (in section 5.2.2).

The first two stages of the data analysis, then, explicate the process of searching the corpus and moving from the segmentation of units for analysis and the description of categories, to the organisation and presentation of the data:
\begin{tabular}{|c|c|c|c|c|}
\hline \begin{tabular}{c} 
Initial read \\
through text \\
data
\end{tabular} & \begin{tabular}{c} 
Identify specific \\
segments of \\
information
\end{tabular} & \begin{tabular}{c} 
Label the \\
segments of \\
information to \\
create categories
\end{tabular} & \begin{tabular}{c} 
Reduce overlap \\
and redundancy \\
among the \\
categories
\end{tabular} & \begin{tabular}{c} 
Create a model \\
incorporating \\
most important \\
categories
\end{tabular} \\
\hline \begin{tabular}{c} 
Many pages of \\
Text
\end{tabular} & \begin{tabular}{c} 
Many segments of \\
Text
\end{tabular} & \(30-40\) categories & \begin{tabular}{c}
\(15-20\) \\
Categories
\end{tabular} & \(3-8\) categories \\
\hline
\end{tabular}

Figure 4-2 The coding process in inductive analysis
(Thomas, 2003: 4)

\subsection*{4.2.3 Evaluation}

Once the data selected for this study had been segmented into clause-like-units, and topic categories and the system for coding those categories had been established, the next stage involved an evaluation process. Lampert and Ervin-Tripp (1993) suggest that this stage focuses on the adequacy of the system and the reliability of the coded data. In order for the coding methodology in this study to be adequate, it was necessary for it to enable the identification and description of clause types, and for predicate frequencies and constituent order to be examined. Moreover, the coding needed to provide an avenue for investigating the relationship between morphological and syntactic processes in order that the study can establish the syntactic arrangements. As the duration and level of this study does not permit an in-depth computerised coding system such as ELAN to be used, and given the high level of inflection in BSL, it was important that the manual coding method allowed for marking of both manual and non-manual features. The basic glossing system described in section 4.1, however, pays central attention to manual features and Johnston (2013) warns against single use of glossing:
...given the existence of corpora annotated in ELAN and the possibilities of using screen grabs or the hyperlink capabilities in modern digital media, we anticipate that simple written glosses of SL examples or text will become less and less common, if not avoided. Used alone like this, glosses almost invariably distort face-to-face SL data. Their use is counter-productive.
(Johnston, 2013: 17)

For this reason, and because this study aims to consider the syntactic structure of BSL from a usage perspective, the boxes-within-boxes notation system is used for the presentation of the examples. This incorporates aspects of the glossing method into it while allowing a holistic approach and enhances the adequacy of the data.

Hand in hand with the adequacy of the data, according to Lampert and Ervin-Tripp, comes the need to ensure that the data is reliable. This research proceeded mindful of Lampert and Ervin-Tripp's note that "coders from different backgrounds often bring with them different presuppositions and concepts that can influence their decision-making, and subsequently, their coding judgements" (ibid.: 184). In the case of analysing sign languages, Johnston and Schembri (2007) notes this difficulty in assigning grammatical classes, suggesting that "a given string (phrase, clause, sentence) may be parsed by different researchers in slightly different ways, yielding alternative grammatical class identification for some signs (p.169). As this subjective influence is naturally impossible to avoid, and pure induction is not possible (Saldanha, 2009), a system for ensuring the reliability of the data is important. The typical techniques for establishing the trustworthiness of research findings include "independent replication of the research, comparison with findings from previous research, triangulation within a project, feedback from participants in the research and feedback from users of the research findings" (Thomas, 2003: 4). In the absence of enough time or space to conduct such robust measurements, this study relied on the support of a first-language user of BSL for datachecking. As the selected tokens are all posited in the Open Access section of the corpus, the data-checker was able to view the signed clips and agree that the initial glosses and subsequent quantitative data analysis are an appropriate reflection of the original source data. This assisted in checking for any errors in understanding the BSL used across the 8 regions, in identifying the boundaries that appear to represent CLUs and in assigning the predicate to its verb type. The process for ensuring this minimum level of reliability is discussed further in the next section, Application.

\subsection*{4.2.4 Application}

The final stage in the analysis process used for this study is the application of the codes, which involves organising the data in order to do "meaningful comparisons and statistical analysis" (Lampert and Ervin-Tripp, 1993: 70). The application begins with a quantitative approach, with the statistical description of predicate types and frequencies, and then of
clause types and frequencies. This relies heavily on the categorisation of signs into subsets - lexical, partly lexical and non-lexical - described in section 5.1. This distinction, which applies to all signs, is important: it is essential to understand the formational organisation of the linguistic units at a lexical level in order to fully appreciate the way these units combine to form syntactic structures. It is anticipated that an understanding of the distribution of the predicate and clause types across the selected data will lead to an understanding of the extent to which each type penetrates the language samples and may provide some insight into the syntactic operations at play. The first step, then, was to establish recurrent use of predicate and clause types (presented in section 5.1.1), a process that Thompson and Hopper (2001) state helps us "to know what constructions speakers are using and storing" (p. 51).

This research project also took advantage of the fact that corpus-based analysis can make use of both quantitative and qualitative techniques, an issue proposed by many researchers (e.g., Biber, Conrad and Reppen, 1983; McEnery and Wilson, 1996; Saldanha, 2009). In fact, Huang's (2000) discussion of corpus analysis methods used during three separate studies (of wordhood, of collocation of Mandarin classifiers and nouns, and of categorical ambiguity in Chinese) stresses the importance of providing a qualitative account of the quantitative data. The qualitative method in this study involved identifying data that would lead to detailed descriptions of the various constructions found in the data (presented in section 5.1.2) that would account for the quantitative data. This multi-method approach was specifically chosen due to the inductive nature of the research. This, it was hoped, would provide:
- access to which predicate constructions are likely to be genuine reflections of BSL use that quantitative analysis enables;
- insight into the internal and external organisation of clauses, and achievement of the richness of description that is facilitated by qualitative analysis.

The evaluation and application stages of the research process, then, concord well and are compatible for the purposes of this study. The support of a data-checker and the multimethod approach to the corpus consolidate some level of internal triangulation, as the following diagram indicates:


Figure 4-3 The data analysis process

\section*{5 Chapter Five - Findings and discussion}

Analysis of the selected corpus tokens leads to a clear understanding of the syntactic arrangement of British Sign Language. The following sets of data analysis, quantitative and qualitative data, highlight the extent to which predicates occur across the 32 samples of narratives, and establish the typical predicate-argument structures of the language.

\subsection*{5.1 Quantitative data: types and frequencies}

The quantitative analysis in this section begins with a presentation of the types and frequencies of the overt predicates used by each participant. This data is followed by a quantitative analysis of the predicates and discussion of the findings of this type. Moving to an illustration of the clause structures found in the data, the section presents the types of structures found and the extent (with percentages rounded to the nearest whole number) to which they occur in the selected tokens.

\subsection*{5.1.1 Predicate types and frequencies}

Predicate types, with frequencies of repeated use indicated by a following number if greater than one, occur in the data as follows (Table 5-1). (Note: auxiliary verbs and particles that function as part of a matrix predicate are not recorded.)

Table 5-1 Fully, partly and non-lexical overt predicate types
\begin{tabular}{|c|c|c|}
\hline \multirow[t]{2}{*}{} & \multicolumn{2}{|c|}{Fully lexical} \\
\hline & \multicolumn{2}{|c|}{Plain} \\
\hline BL13 & \begin{tabular}{l}
KNOW \\
ENJOY \\
CLOSE \\
DRINK-4 \\
FEEL \\
SHOCK-3 \\
EXPECT \\
RUN \\
LAUGH
\end{tabular} & \begin{tabular}{l}
FINISH \\
DECIDE \\
WANT-2 \\
CALM-DOWN \\
THINK \\
TALK-2
\end{tabular} \\
\hline & & 22 \\
\hline BL14 & \begin{tabular}{l}
REMEMBER-3 \\
SOCIALISE \\
KNOW \\
GIVE-UP \\
HEAR \\
THINK-4
\end{tabular} & EXAGGERATE DAMAGE RECOVER SURPRISE \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|c|}{Partly lexical} & \multirow[t]{2}{*}{\begin{tabular}{l}
Non-lexical \\
Gestural
\end{tabular}} & \multirow[t]{2}{*}{Total} \\
\hline Indicating & Depicting & & \\
\hline ARGUE & WALK-4 & PUSH & \\
\hline LOOK-4 & TURN-ON & SHUT & \\
\hline HAVE & KICK & LOCK & \\
\hline CHECK & HOLD & BANG-2 & \\
\hline MOVE-5 & ROCK & HIT & \\
\hline HURT & RUN-OVER & DENT & \\
\hline \multirow[t]{3}{*}{DRIVE-2} & GO-4 & TOUCH & \\
\hline & COME & PANIC & \\
\hline & GO-IN & & \\
\hline 15 & 15 & 9 & 61 \\
\hline LOOK-6 & GO-5 & BANG & \\
\hline CHECK-4 & WALK-6 & HIT & \\
\hline LOOK-AFTER & RUN-OVER & & \\
\hline BLEED & FALL-3 & & \\
\hline DISCUSS & LAY & & \\
\hline STAND-3 & COME & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & ENJOY-2 FEEL HESITATE & & \begin{tabular}{l}
SEND-2 \\
STAY-5 \\
MOVE \\
HELP \\
INTERVIEW
\end{tabular} & & & \\
\hline & \multicolumn{2}{|r|}{19} & 25 & 16 & 14 & 74 \\
\hline BL15 & \begin{tabular}{l}
REMEMBER-2 \\
EXPECT-2 \\
EAT \\
EXPERIENCE-5 \\
WANT-2 \\
KNOW-3 \\
LAUGH \\
HAPPEN \\
THINK \\
RELY \\
LISTEN \\
USED-TO
\end{tabular} & \begin{tabular}{l}
CARRY-ON \\
FEEL-SICK \\
FEEL-2 \\
MAKE \\
DO \\
RELIEVE
\end{tabular} & \begin{tabular}{l}
TREAT-6 LOOK-2 \\
SHOW \\
HAVE-2 \\
CHECK-2 \\
SIT-2 \\
CONTROL-4 \\
STAY-2 \\
HELP \\
SELL \\
TELL-3 \\
LOSE
\end{tabular} & \begin{tabular}{l}
SAIL-8 \\
GET-ON \\
BRING \\
HOLD-3 \\
GO-3 \\
PASS-2 \\
COME \\
PULL \\
PUT-DOWN-3 \\
TURN-8
\end{tabular} & \begin{tabular}{l}
STOP-2 \\
VOMIT \\
FISH-3 \\
DOCK \\
FIGHT-2 \\
CATCH \\
TOUCH-4
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{28} & 27 & 31 & 14 & 100 \\
\hline BL16 & \begin{tabular}{l}
THINK-5 \\
DO2 \\
PLAN \\
OBSSESS \\
ENJOY \\
WANT-6 \\
KNOW-9 \\
IGNORE \\
TALK-2 \\
WAIT-5 \\
TRY4 \\
SETTLE \\
ACT \\
HAPPEN \\
MAKE3 \\
REALISE
\end{tabular} & ANNOY SATISFY REMEMBER FINISH STOP & \begin{tabular}{l}
LOOK-9 \\
SHOW-3 \\
TAP-5 \\
ASK \\
TELL-2 \\
SUPERVISE \\
CHECK \\
BLAME-2 \\
GIVE-2 \\
HAVE-3 \\
STAY \\
DRIVE-3 \\
MOVE \\
SIT \\
TAKE
\end{tabular} & \begin{tabular}{l}
GO-3 \\
ARRIVE-2 \\
COME-2 \\
LOCK \\
WEAR-OUT \\
PUT-IN-3 \\
PULL \\
WALK-4 \\
GET-ON \\
TURN \\
SLEEP \\
CRY-3 \\
GET-OFF-2 \\
FALL
\end{tabular} & \begin{tabular}{l}
BLOW SPIT \\
SHAKE-2 \\
SHUT \\
OPEN-2 \\
STEAM \\
CRACKLE-2 \\
THROW-5 \\
BANG \\
PANIC \\
CHANGE-2 \\
LOSE \\
PLAY \\
BURN-2 \\
STOP \\
HAND-UP \\
SCREAM \\
FILM-2 \\
THROB \\
LICK \\
RUB \\
GESTURE
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{49} & 36 & 23 & 32 & 140 \\
\hline BM7 & \begin{tabular}{l}
TALK-3 \\
WANT-3 \\
KNOW-2 \\
THINK \\
LAUGH \\
FEEL-2 \\
UNDERSTAND SIGN \\
BORE-3
\end{tabular} & \begin{tabular}{l}
LIVE-2 \\
WEAR-OUT \\
DO-4 \\
HAPPEN \\
EXCUSE-2 \\
TRY \\
TYPE \\
RUN-2 \\
BOTHER \\
HATE-2
\end{tabular} & MEET LOOK5 WIND-UP PHONE-2 STAY TEASE NAG & \begin{tabular}{l}
COME11 \\
WALK2 \\
FOLLOW \\
GO-6 \\
GO-IN \\
EAT3 \\
POINT
\end{tabular} & \begin{tabular}{l}
GET-OFF-3 \\
LIVEN-UP \\
PLAY-2 \\
CLIMB-3 \\
RELAX-5
\end{tabular} & \\
\hline & & 31 & 12 & 31 & 8 & 82 \\
\hline BM8 & \begin{tabular}{l}
WAIT-6 DO-2 \\
START-2 \\
TALK-12 \\
KNOW-3 \\
THINK-5 \\
ACCEPT \\
FEEL-SICK-5 \\
DRINK \\
EAT
\end{tabular} & ALLOW REMEMBER SATISFY EXPECT-2 WORRY & \begin{tabular}{l}
ASK TAP LOOK-10 \\
TELL-3 LOSE-7 GIVE-4 CONTACT RAPE LEND PAY-3
\end{tabular} & \begin{tabular}{l}
GO-28 \\
ARRIVE-3 \\
WALK-4 \\
LEAVE \\
FALL \\
GET-OFF-6 \\
PARTY-2 \\
COME-4 \\
FOLLOW \\
SEPARATE
\end{tabular} & \begin{tabular}{l}
CLIMB \\
DANCE \\
GATHER-2 \\
CHANGE \\
EXPLODE \\
PACK \\
SCOLD \\
OPEN \\
MINGLE \\
GRAB
\end{tabular} & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & EXCITE BOTHER NEED EXCUSE MISS RUN CARRY-ON AGREE LAUGH & & \begin{tabular}{l}
DISAPPEAR-2 \\
SIT-2 \\
MOVE \\
KEEP \\
DRIVE \\
BUY-5 \\
STAND \\
TAKE \\
PHONE-2
\end{tabular} & SPOT & PREPARE & \\
\hline & \multicolumn{2}{|r|}{54} & 41 & 48 & 17 & 160 \\
\hline BM15 & REMEMBER3 KNOW BORE FEEL THINK3 BOTHER EXCITE HAPPEN-2 DISAPPOINT & RUN START & BLEED2 HAVE MOVE MISS & \begin{tabular}{l}
GO-4 \\
FOLLOW \\
SLIP \\
PULL \\
ARRIVE-2 \\
CLIMB-UP-3 \\
WALK \\
PUT-IN \\
SORT \\
HOLD
\end{tabular} & SLIDE-3 OPEN PLAY THROUGH-3 GET PANIC-3 BANG2 & \\
\hline & \multicolumn{2}{|r|}{16} & 5 & 12 & 17 & 50 \\
\hline BM16 & \begin{tabular}{l}
SPRING-TO-MIND \\
KNOW-4 \\
REMEMBER \\
HAVE-A-LOOK \\
HIRE \\
NEED-3 \\
THINK \\
CALL \\
DO \\
WEAR \\
WORRY
\end{tabular} & PUT-OFF FEEL REALISE & \begin{tabular}{l}
LOOK-2 \\
ADVISE-2 \\
TELL \\
BUY-2 \\
E-MAIL \\
SELL-2 \\
HAVE \\
STAND-2
\end{tabular} & \begin{tabular}{l}
GO-5 \\
ARRIVE \\
WALK-3 \\
FOLLOW \\
BRING \\
POUR \\
FLY \\
DRIVE-2 \\
COME-OFF \\
CHOP \\
COME-4
\end{tabular} & \begin{tabular}{l}
THROW4 MINGLE \\
CRUSH2 \\
PUSH \\
LOSE \\
CROWD4 \\
SPLATTER \\
COVER2 \\
OPEN \\
CLEAN2 CLEAR \\
UP
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{18} & 14 & 20 & 20 & 72 \\
\hline CF9 & \begin{tabular}{l}
REMEMBER-2 \\
TALK-3 \\
DO \\
IGNORE-2 \\
PRETEND \\
RUN \\
THINK-3
\end{tabular} & \begin{tabular}{l}
SHOCK-2 \\
FEEL-2 \\
TRY \\
DISAPPEAR \\
REALISE \\
DIE \\
LIKE
\end{tabular} & \begin{tabular}{l}
LOOK-7 \\
TAP \\
HAVE \\
SIT-2 \\
PINCH-2 \\
POINT
\end{tabular} & WALK LEAVE-2 PUT-IN FLY-3 GO-2 HOLD & \begin{tabular}{l}
SHUT \\
PAW \\
DANCE \\
OPEN-2 \\
THROW-2 \\
BARGE-IN \\
CLOSE-2 CATCH \\
SURPRISE \\
SPOT-2
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{22} & 14 & 10 & 14 & 60 \\
\hline CF10 & \begin{tabular}{l}
START-2 \\
TRY-3 \\
LOVE-5 \\
FEEL \\
ADORE \\
LIKE-3 \\
WANT \\
VARY \\
RUN \\
TALK
\end{tabular} & \begin{tabular}{l}
UNDERSTAND STARTLE SLEEP REALISE ACT \\
LAUGH-3 \\
RELAX-2
\end{tabular} & \begin{tabular}{l}
LOOK-9 \\
GRAB \\
TELL \\
HAVE-2 \\
VISIT \\
MOVE \\
GIVE \\
SIT-2 \\
GROW-2 \\
LEAVE
\end{tabular} & \begin{tabular}{l}
FOLLOW \\
COME-2 \\
PICK-UP-2 \\
STROLL \\
PUT-DOWN \\
THROW \\
STROKE \\
RUN-ROUND-2 \\
GO \\
GO-IN-2
\end{tabular} &  & \\
\hline & \multicolumn{2}{|r|}{29} & 20 & 13 & 11 & 73 \\
\hline CF23 & SHOP-2 LIKE INTEREST3 & KNOW & \[
\begin{array}{|l|}
\hline \text { SIT-3 } \\
\text { LOOK-2 }
\end{array}
\] & GO-IN-2 WALK GO-5 & & \\
\hline & \multicolumn{2}{|r|}{7} & 5 & 8 & 0 & 20 \\
\hline CF24 & KNOW-4 WORK BORN4 & SMELL CONTINUE VARY & \[
\begin{aligned}
& \text { LOOK2 } \\
& \text { LOSE2 } \\
& \text { RECOGNISE } \\
& \hline
\end{aligned}
\] & \[
\begin{aligned}
& \text { FOLLOW } \\
& \text { POACH } \\
& \text { PUT-IN } \\
& \hline
\end{aligned}
\] & CATCH-3 STOP-3 STRANGLE & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & AGREE DIE & HAPPEN & FINE LINK & BRING & \[
\begin{aligned}
& \text { OPEN-2 } \\
& \text { OFF } \\
& \text { TEAR } \\
& \hline
\end{aligned}
\] & \\
\hline & \multicolumn{2}{|r|}{17} & 5 & 4 & 11 & 37 \\
\hline \multirow[t]{2}{*}{L11} & THINK-3 AFFECT REMEMBER WORK MAKE LAUGH SIGN-4 & & \begin{tabular}{l}
VISIT-2 \\
SWAP \\
HAVE \\
DISAPPEAR \\
GIVE-2 \\
SEND \\
LOOK \\
SYMPATHISE
\end{tabular} & \[
\begin{aligned}
& \text { COME-3 } \\
& \text { GO-2 } \\
& \text { GATHER }
\end{aligned}
\] & & \\
\hline & \multicolumn{2}{|r|}{12} & 10 & 5 & 0 & 27 \\
\hline L12 & \begin{tabular}{l}
BREAKDOWN BORN-2 \\
LIVE \\
WANT
\end{tabular} & \begin{tabular}{l}
WORK \\
KNOW-2 WORRY
\end{tabular} & MOVE-3 STAY LOOK & & & \\
\hline & \multicolumn{2}{|r|}{8} & 5 & 0 & 0 & 13 \\
\hline L13 & \begin{tabular}{l}
WANT-2 \\
STUN \\
FINISH \\
MARK \\
FEEL \\
REALISE \\
MIND
\end{tabular} & \begin{tabular}{l}
LAUGH-2 \\
SWALLOW \\
PUZZLE-2 \\
SCREAM
\end{tabular} & HELP BLEED LOOK7 & \begin{tabular}{l}
WALK-5 \\
FALL-2 \\
CARRY JUT-UP SCATTER PICK-UP PUT-IN GO-IN
\end{tabular} & \begin{tabular}{l}
GET-OFF \\
WIPE \\
BANG \\
GET-UP
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{15} & 10 & 12 & 12 & 49 \\
\hline L14 & WANT2 HATE LAUGH WAIT5 READ CONFUSE EXCUSE-2 THINK-2 & DRINK TASTE2 WASTE & LOOK2 TELL2 EXPLAIN STAY TEASE STAND2 CHECK & LEAVE ARRIVE GO4 GO-UP2 WALK & \begin{tabular}{l}
THROW \\
RUSH3 PANIC OPEN CLOSE2 CARRY PRESS4
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{19} & 11 & 9 & 5 & 44 \\
\hline M14 & \begin{tabular}{l}
REMEMBER \\
STUDY3 \\
STRESS \\
LIVE \\
NEED \\
FOCUS \\
USE \\
TRY2 \\
FANCY \\
TYPE3 \\
EMBARRASS-3 \\
MAKE-SURE
\end{tabular} & \begin{tabular}{l}
KNOW2 \\
WAIT4 \\
WANT3 \\
DAMAGE2 \\
WORRY \\
CARRY-ON \\
THINK-6 \\
FEEL \\
DO \\
WORK \\
REALISE \\
WRITE
\end{tabular} & \begin{tabular}{l}
TAP2 \\
LOOK-8 \\
CHECK \\
EXPLAIN2 \\
PHONE2 \\
INFORM \\
BUY \\
STAY2 \\
SCOLD \\
HAVE \\
POINT
\end{tabular} & \begin{tabular}{l}
GO12 \\
COME9 \\
LEAVE \\
GO-IN2 \\
WALK3 \\
PUT-IN \\
PICK-UP2 \\
RAM \\
PUT-DOWN
\end{tabular} & \begin{tabular}{l}
SIGH \\
PRESS \\
FUME \\
OPEN2 \\
SMOKE \\
SURGE \\
CLOSE2 \\
BOTHER \\
STAND2
\end{tabular} & \\
\hline & \multicolumn{2}{|r|}{43} & 24 & 32 & 10 & 109 \\
\hline M13 & \begin{tabular}{l}
NEED-3 DO-2 \\
WANT-8 \\
KNOW-2 \\
PLAN \\
BOOK \\
EXCITE-2 \\
WAIT \\
HAPPEN-4 \\
LIVE \\
OBSESS \\
CALM-DOWN \\
LAUGH
\end{tabular} & SURPRISE INTEREST FORGET-3 REMEMBER FINISH SCREAM FEEL-SICK-2 & \begin{tabular}{l}
LOOK-10 \\
SIGN-2 \\
TAP-2 \\
AVOID \\
GIVE-3 \\
HAVE \\
TELL \\
MOVE-4
\end{tabular} & \begin{tabular}{l}
GO-12 \\
LIE \\
PUT-IN2 \\
FLY \\
ARRIVE \\
LAND2 \\
HOLD \\
MANAGE \\
WALK7 \\
TRAVEL-4 \\
GO-IN5 \\
PRESS3 \\
BRAKE
\end{tabular} & \begin{tabular}{l}
GATHER4 \\
STOP-3 \\
RUB3 \\
BOAST \\
CATCH \\
OPEN \\
LOSE \\
ADMIRE \\
CLOSE2 \\
BURN \\
GAMBLE3 \\
SHIVER \\
PACK
\end{tabular} & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & FEEL CONTINUE TIRE & & & FOLLOW CARRY-3 COME2 & POINT-2 FOB-OFF CROSS-FINGER WAVE ROCK 2 UPSET-2 & \\
\hline & \multicolumn{2}{|r|}{42} & 26 & 46 & 31 & 145 \\
\hline M17 & \begin{tabular}{l}
KNOW5 START DIE \\
WANT2 \\
THINK4 WRITE CONFIRM SURPRISE DO EXCITE TRY CONTINUE2
\end{tabular} & \begin{tabular}{l}
EXPECT \\
IMAGINE START-2 \\
TRANSLATE WELCOME GIVE-UP FORGET FEEL-3 LIKE-3 REMEMBER THROUGH-2
\end{tabular} & \begin{tabular}{l}
ASK-4 \\
MEET2 \\
INTERVIEW \\
HELP2 \\
SIGN \\
TELL \\
LIPREAD2 \\
RECEIVE \\
DISCUSS-2 \\
FIND \\
LOOK-3 \\
GIVE
\end{tabular} & \[
\begin{aligned}
& \text { GO-IN-3 } \\
& \text { GO-4 } \\
& \text { ARRIVE10 } \\
& \text { COME } \\
& \text { TRAVEL-8 } \\
& \text { BRING2 } \\
& \text { EAT }
\end{aligned}
\] & \begin{tabular}{l}
BET \\
STOP \\
SUN-UP \\
WARM-UP \\
MIX
\end{tabular} & \\
\hline & & 38 & 21 & 29 & 4 & 92 \\
\hline M18 & \begin{tabular}{l}
BORN \\
START \\
SLEEP-5 \\
WANT3 \\
LOVE3 \\
EXCITE4 \\
KNOW-4 \\
SMELL2 \\
REMEMBER \\
WRITE \\
HAPPEN \\
EAT \\
TRY \\
PLAY2 \\
RUN \\
CONTINUE
\end{tabular} & \begin{tabular}{l}
WAIT \\
TALK \\
DO \\
ENJOY4 \\
ALLOW \\
FEEL \\
MARRY \\
AGREE \\
LEARN2 \\
THINK \\
SIGN \\
WAKE-2 \\
TIRE
\end{tabular} & \begin{tabular}{l}
MEET \\
ALTERNATE \\
TAP \\
SIT4 \\
GIVE6 \\
LOOK-7 \\
TAKE2 \\
TEACH \\
STAY2 \\
STAND5 \\
TELL2 \\
VISIT \\
ASK \\
SHOW \\
DRIVE
\end{tabular} & \begin{tabular}{l}
GO-8 \\
LIGHT6 \\
WALK6 \\
COME7 \\
GO-IN2 \\
ARRIVE2 \\
EMPTY \\
TRAVEL2 \\
PULL-UP4 \\
PUT3 \\
PULL-DOWN3 \\
GROW \\
PICK-UP
\end{tabular} & \begin{tabular}{l}
BLOW9 \\
MOVE \\
CRY \\
KNOCK2 \\
GET-UP2 \\
DRESS \\
OPEN4 \\
HUG \\
PANIC \\
LOOK-ROUND \\
FLICKER5 \\
RUB \\
TOUCH \\
SMACK \\
FREEZE \\
SNUGGLE \\
AIR-IN
\end{tabular} & \\
\hline & & 50 & 37 & 40 & 39 & 166 \\
\hline N11 & \begin{tabular}{l}
FINGERSPELL USE \\
START \\
FEEL \\
SURPRISE
\end{tabular} & THINK LIKE CHANGE3 PREFER BASE WRITE & SIGN3 RECEIVE HELP2 HAVE LOOK2 & GO COME & & \\
\hline & & 10 & 9 & 2 & 0 & 21 \\
\hline N12 & \begin{tabular}{l}
TALK4 WANT5 \\
REMEMBER10 \\
FINISH4 \\
LOVE \\
CALL \\
TRY \\
RELIEVE \\
THINK-4 \\
HAPPEN \\
EAGER2 \\
START-2
\end{tabular} & \begin{tabular}{l}
LIVE2 \\
KNOW4 \\
FEEL-SICK2 \\
LIKE-3 \\
SHOP \\
STICK \\
SNOW \\
BOARD \\
RAIN \\
TIRE \\
WAIT3
\end{tabular} & \begin{tabular}{l}
RECOGNISE \\
HAVE-2 \\
TAKE-6 \\
LIFT \\
SIGN2 \\
STAY-4 \\
LOOK4 \\
PAY \\
DISAPPEAR2 \\
EXPLAIN
\end{tabular} & \begin{tabular}{l}
GO9 \\
WALK3 \\
GROW2 \\
GET2 \\
ARRIVE5 \\
COME4 \\
PICK-UP2 \\
CATCH \\
DROP-OFF \\
GET-OFF3
\end{tabular} & & \\
\hline & & 58 & 21 & 26 & 0 & 105 \\
\hline N21 & \begin{tabular}{l}
KNOW7 \\
WANT-8 \\
MATTER \\
DO2 \\
FINISH3 \\
AFFORD2
\end{tabular} & \begin{tabular}{l}
REMEMBER2 \\
THINK-3 \\
IMAGINE \\
AFFECT \\
WRITE \\
READ
\end{tabular} & \begin{tabular}{l}
TELL6 \\
TAP6 \\
GIVE-5 \\
ASK-6 \\
RECOGNISE \\
ACCEPT
\end{tabular} & ARRIVE4 TRAVEL GO17 GO-IN-5 LEAVE FLY3 3 & CHANGE4 CATCH-3 GET-UP SUFFER2 TAKE-PHOTO-2 WAVE & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & \begin{tabular}{l}
FINGERSPELL \\
TALK2 \\
LEARN \\
DIE \\
FOLLOW-3 \\
BOTHER \\
ALLOW6 \\
PUZZLE \\
BEHAVE \\
FEEL \\
UNDERSTAND
\end{tabular} & FEEL-SICK INTEREST SHOCK5 REALISE RUN SIGN IGNORE-5 FRIGHTEN-4 HEAR SURPRISE-2 & \begin{tabular}{l}
HAVE-4 \\
TEACH \\
STAND-8 \\
DRIVE \\
RESPECT-4 \\
LOOK-17 \\
COMPARE \\
CHECK \\
WARN2 \\
CHALLENGE
\end{tabular} & WALK14 SPEND GO-UP2 GET-OFF2 GET-ON-2 COME5 FOLLOW-2 GO-DOWN-2 & \begin{tabular}{l}
THROW3 OPEN-6 CRY2 \\
SMILE3 \\
ENCOURAGE2 \\
GESTURE-3 \\
BOW10 \\
PANIC-2 \\
NOD \\
GUIDE
\end{tabular} & \\
\hline & & 70 & 69 & 65 & 41 & 245 \\
\hline N22 & \begin{tabular}{l}
MISS \\
MARRY \\
THINK3 \\
PLAN \\
RETIRE \\
REMEMBER \\
WANT2 \\
HEAR2 \\
HAPPEN \\
CRY \\
FEEL \\
FEEL-SICK2 \\
SHOCK4 \\
PASS-AWAY \\
USE-TO \\
EXCITE
\end{tabular} & \begin{tabular}{l}
KNOW \\
EXPECT2 \\
DIE \\
BELIEVE4 \\
TALK2 \\
HIDE2 \\
CHANGE \\
ENJOY \\
GIVE-SPEECH \\
LIKE
\end{tabular} & \begin{tabular}{l}
MEET \\
LOOK6 \\
BREAK \\
TELL3 \\
PHONE \\
KNOCK \\
HAVE2 \\
BUY \\
TAKE \\
SIT4 \\
KEEP \\
DISAPPEAR-3 \\
DRIVE \\
JOIN \\
BAPTISE \\
GROW4 \\
PICK
\end{tabular} & \[
\begin{aligned}
& \text { GO5 } \\
& \text { COME5 }
\end{aligned}
\] & SHAKE SCREAM SLAP & \\
\hline & & 36 & 31 & 14 & 5 & 86 \\
\hline BF15 & \begin{tabular}{l}
DO \\
THINK2 \\
SIGN-19 \\
KNOW4 \\
LEARN \\
UNDERSTAND \\
SHOP \\
REFRAIN \\
TALK3 \\
WANT8 \\
LIKE \\
TRY4
\end{tabular} & \begin{tabular}{l}
FORGET \\
REMEMBER2 \\
USED-TO \\
CHANGE \\
BREAKDOWN \\
FINISH \\
LAUGH
\end{tabular} & \begin{tabular}{l}
PRESENT LOOK7 \\
TEMPT \\
TELL9 \\
TEACH \\
STOP \\
SWITCH-OFF2 \\
HAVE \\
SIGN2 \\
SIT5 \\
GIVE \\
MEET6 \\
ASK \\
EXPLAIN \\
LIPREAD \\
LINK4
\end{tabular} & \begin{tabular}{l}
GO5 \\
WALK2 \\
EXPAND ARRIVE COME5
\end{tabular} & WAVE PANIC & \\
\hline & & 55 & 38 & 14 & 8 & 115 \\
\hline BF16 & \begin{tabular}{l}
KNOW4 \\
WANT6 \\
CARE \\
THINK-5 \\
PLAY-2 \\
LIKE3 \\
SIGN \\
LOVE2 \\
TYPE3 \\
RUN \\
SPOIL3 \\
IGNORE \\
UNDERSTAND \\
BORE \\
WAIT4
\end{tabular} & TALK-4 LAUGH & \begin{tabular}{l}
LOOK-AFTER2 \\
LOOK4 \\
SEND \\
GET2 \\
REPLY2 \\
HAVE2 \\
BUY-6 \\
STAND \\
PAY \\
EXPLAIN \\
SIT5 \\
GIVE2 \\
TAKE \\
TREAT2 \\
TEACH2 \\
SEARCH2 \\
TELL14
\end{tabular} & \begin{tabular}{l}
GO4 \\
GO-IN2 \\
PICK-UP2 \\
ARRIVE-4 \\
KNOCK \\
COME3 \\
RUN-ROUND2 \\
LEAVE4 \\
WALK2 \\
TRAVEL \\
HOLD \\
GROW
\end{tabular} & LICK2 OPEN STROKE6 PUSH3 ROLL SCROLL HESITATE GRAB & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & \multicolumn{2}{|r|}{41} & 49 & 27 & 18 & 135 \\
\hline BF21 & \begin{tabular}{l}
DECIDE
KNOW-2 \\
FEEL5 \\
WANT3 \\
BORE \\
LIKE \\
REST \\
TALK \\
WAIT \\
EAT-2 \\
WISH \\
MAKE \\
WASTE \\
THINK-3 \\
ENJOY
\end{tabular} & \begin{tabular}{l}
SLEEP6 \\
LAUGH
\end{tabular} & PAY3
TELL2
LOOK6
GET2
INTERRUPT
TEXT
HAVE5
TAP & \begin{tabular}{l}
GO12 \\
TOSS+TURN2 \\
FLY-2 \\
ARRIVE5 \\
MOVE \\
GO-IN \\
LAY \\
SWIVEL \\
BRING3 \\
WALK2 \\
LAND \\
GET-UP-2 \\
QUEUE \\
CYCLE \\
COME
\end{tabular} & \begin{tabular}{l}
CHECK-IN-2 \\
TWIDDLE \\
FUME \\
RAFT-3 \\
SWIM2 \\
SPLASH \\
OPEN \\
TAKE-PHOTO
\end{tabular} & \\
\hline & & 32 & 19 & 42 & 13 & 106 \\
\hline BF22 & \begin{tabular}{l}
SLEEP \\
WANT5 \\
STUDY2 \\
REALISE \\
THINK \\
EAT \\
SHOP \\
MATTER \\
DRIVE3 \\
FEEL \\
RUN15 \\
CONTINUE \\
EXCITE-3 \\
SURPRISE
\end{tabular} & \begin{tabular}{l}
CARE \\
CANCEL \\
WAIT3 \\
START5 \\
TIRE \\
BOOK \\
RISK \\
FINISH \\
BORE \\
PREPARE-2
\end{tabular} & \begin{tabular}{l}
TAP3 HELP \\
MEET9 LOOK8 \\
SHUT-UP3 \\
GIVE \\
FIND \\
HAVE3 \\
HURT-7 \\
SIT \\
SWAP \\
SEARCH2 \\
AIM
\end{tabular} & \begin{tabular}{l}
GO13 \\
GET \\
COME2 \\
ARRIVE5 \\
WALK2 \\
GET-UP \\
GO-IN3 \\
TURN-2 \\
DONATE \\
WAKE-UP-2 \\
LIMP \\
FLY \\
TRAVEL2 \\
CROWD-5 \\
PUT2
\end{tabular} & STOP3
DODGE3
SHUSH
FIRE & \\
\hline & & 54 & 42 & 38 & 9 & 143 \\
\hline G11 & \begin{tabular}{l}
TALK \\
MISUNDERSTAND \\
WRITE \\
PLAY3 \\
BOTHER3 \\
FEEL \\
EAT5 \\
FORGET \\
WORK \\
LIVE \\
DECIDE \\
KNOW2 \\
THINK2 \\
START \\
WANT2 \\
RUN-5 \\
PROVE
\end{tabular} & FEEL-SICK
FRIGHTEN & TEACH-8
LOOK5
TELL4
HURT
ATTACK
LOOK-AFTER
BLEED2
STAY3
CHECK2
GIVE
MOVE2
ASK
WASH2
PHONE
TAKE & \begin{tabular}{l}
GO7 \\
GO-IN4 \\
COME2 \\
JUMP \\
HOLD4 \\
WALK2 \\
GROW \\
CARRY \\
PUT-ON3 \\
TAKE-OFF2 \\
LEAVE \\
EMPTY \\
PULL4 \\
GET-UP \\
PUT \\
GO-UP2
\end{tabular} & \begin{tabular}{l}
TACKLE \\
HIT2 \\
MOP \\
KICK \\
BRUSH \\
OPEN \\
DAB-2 \\
GRAB \\
SHAKE \\
CANE \\
KILL \\
SHIVER \\
ON-2 \\
SWING \\
AIR-IN \\
WAVE3 \\
FLY \\
OVER \\
NEED
\end{tabular} & \\
\hline & & 35 & 35 & 38 & 22 & 130 \\
\hline G12 & \begin{tabular}{l}
SLEEP \\
COUGH8 \\
WANT13 \\
HEAR4 \\
TRY2 \\
THINK11 \\
KNOW5 \\
SMOKE-5 \\
HOPE4 \\
WAIT11 \\
MAKE \\
TALK2 \\
FINISH-4
\end{tabular} & WASTE HURRY3 SEEM SIGN LIKE SING OBJECT & \begin{tabular}{l} 
GIVE-4 \\
TELL9 \\
HURT \\
TAP4 \\
BRING \\
ASK2 \\
RECEIVE2 \\
EXPLAIN-2 \\
SIT9 \\
STAY-2 \\
LOSE \\
TAKE-TURNS \\
STAND \\
\hline
\end{tabular} & TOSS+TURN3
GO18
GO-IN-5
SPREAD
PUT-IN-8
TAKE-OUT-5
THROW
GET
WALK & \begin{tabular}{l}
NOD-3 \\
WAS \\
DRIP \\
GET-UP \\
STOP3 \\
MIX2 \\
BREATHE23 \\
CATCH \\
CLEAN \\
PRICK \\
HAND-UP \\
HAND-DOWN \\
PUMP3
\end{tabular} & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline & \begin{tabular}{l}
FEEL-SICK CONTINUE2 \\
DRINK-3 \\
HAPPEN \\
MEAN \\
STRESS
\end{tabular} & & \begin{tabular}{l}
LOOK \\
MOVE2 \\
PHONE \\
HAVE \\
TAKE-5 \\
CHECK3 \\
POST
\end{tabular} & & \begin{tabular}{l}
CLOSE \\
OPEN2 \\
BLOCK \\
SPRAY \\
CIRCULATE
\end{tabular} & \\
\hline & & 88 & 54 & 43 & 49 & 234 \\
\hline G13 & \begin{tabular}{l}
RELAX2 \\
HAPPEN2 \\
RUSH \\
WRITE4 \\
TYPE3 \\
WANT-5 \\
APPROVE \\
PUBLICISE \\
SEEM-2 \\
PRESENT \\
THINK4 \\
SIGN-2 \\
LIKE \\
CONTINUE-3 \\
FEEL \\
LINK \\
PROGRESS \\
HOPE-2 \\
DRIVE \\
TIRE
\end{tabular} & \begin{tabular}{l}
INTEREST BECOME DO \\
ORGANISE2 \\
TRY4 \\
DEVELOP \\
TALK-4 \\
PLAY \\
ALLOW \\
UNDERSTAND PRINT2 \\
EXPECT \\
FINISH \\
ENJOY \\
SET-UP-4 \\
VOLUNTEER \\
SURPRISE \\
WELCOME-2 \\
RESPONSIBLE \\
RAIN
\end{tabular} & \begin{tabular}{l}
MEET4 \\
LOOK6 \\
FAX2 \\
INFORM2 \\
EXPLAIN4 \\
HELP \\
DISCUSS \\
CONTACT3 \\
ENCOURAGE \\
TELL2 \\
GIVE \\
HAVE-4 \\
SUPPORT \\
CONTROL-3 \\
DELEGATE
\end{tabular} & \begin{tabular}{l}
GO6 \\
DROP-OFF2 \\
WALK4 \\
GO-IN4 \\
GET \\
SEND \\
SWIM \\
EXPAND-3 \\
COME5 \\
PUT2 \\
HOLD \\
LAY2 \\
ARRIVE2 \\
GET-ON2 \\
FALL \\
POINT \\
POP-UP
\end{tabular} & \[
\begin{array}{|l}
\hline \text { RUN-ROUND } \\
\text { OPEN } \\
\text { NOD } \\
\text { ROCK }
\end{array}
\] & \\
\hline & & 71 & 37 & 36 & 7 & 151 \\
\hline G14 & \begin{tabular}{l}
KNOW6 \\
START3 \\
WANT7 \\
REMEMBER9 \\
TRY2 \\
FORGET2 \\
WIN \\
DIE2 \\
FINISH3 \\
LEARN \\
AGREE2 \\
WAIT \\
WORK5 \\
PLAY \\
PREVENT \\
LIKE-9 \\
HEAR2 \\
SHOCK2 \\
USED-TO2 \\
RUN \\
BOTHER \\
DIRTY
\end{tabular} & \begin{tabular}{l}
LIVE2 \\
SATISFY \\
DO3 \\
REFRAIN \\
LOVE3 \\
REALISE \\
TALK2 \\
THINK6 \\
EXCITE-3 \\
FRIGHTEN-3 \\
CRY-2 \\
GET-ON \\
LIE \\
USE \\
DRIVE \\
ORDER
\end{tabular} & \begin{tabular}{l}
HELP \\
LOOK10 \\
LOOK-AFTER3 \\
ASK4 \\
FIND \\
ARGUE \\
TELL2 \\
TAKE-TURNS \\
STAY \\
BUY \\
PAY3 \\
LIPREAD \\
TAKE5 \\
WASH3 \\
DRIVE \\
TEACH \\
HAVE6 \\
INFORM \\
SIT7 \\
GIVE \\
POST2 \\
EXPLAIN
\end{tabular} & \begin{tabular}{l}
PUT-IN7 GO18 \\
PICK-UP4 LAY \\
ARRIVE \\
HOLD2 \\
EAT2 \\
PULL-2 \\
NIBBLE2 \\
PUT-ON2 \\
JUMP \\
THROW2 \\
TAKE-OFF2 \\
TURN \\
PUT3 \\
MUNCH \\
LEAVE2 \\
GROW2 \\
FOLLOW \\
KNOCK \\
COME5 \\
WALK4
\end{tabular} & \begin{tabular}{l}
STRANGLE OPEN4 \\
TOUCH2 \\
STOP3 \\
WAG2 \\
GRAB-2 \\
GROOM-2 \\
PRESS \\
SWIM-2 \\
SLEEP \\
STROKE2 \\
SHIVER \\
MIX \\
FIT \\
SPREAD \\
BARK \\
LINK \\
CRY-2 \\
DROWN
\end{tabular} & \\
\hline & & 106 & 56 & 63 & 32 & 257 \\
\hline & & & 823 & 812 & & \\
\hline Total & & & & & 472 & 3,302 \\
\hline
\end{tabular}

A quantitative summary of the results is presented in the following table (Table 5-2) and illustrative chart (Figure 5-1):

Table 5-2 Quantitative analysis of overt predicate frequencies
\left.\begin{tabular}{|l|l|l|}
\hline Predicate type & \multicolumn{2}{|l|}{ Number of occurrences } \\
\hline Fully lexical - plain & 1,195 & 1,195 \\
Partly lexical - indicating & 823 \\
Partly lexical - depicting & 812
\end{tabular}\(\right\}\)\begin{tabular}{l}
1,635 \\
Non-lexical - gestural \\
\hline Total number of predicates
\end{tabular}


Figure 5-1 Overview of predicate types and frequencies

The results table above (Table 5-2) indicates that the internal composition of the grammatical structures of BSL comprises predicate constructions containing fully, partly and non-lexical verb signs, all of which occur significantly in BSL. In answer to the first and second research questions, concerning the types and frequency of various structures, the findings indicate that structures containing partly lexical predicates (at 50\%) occur with significantly more frequency than those containing fully lexical predicates (36\%) which, in turn, occur more frequently than non-lexical predicate structures (14\%). When the results of the partly lexical and the non-lexical verbal predicates are taken into account, the findings show that a significant part of the data analysed (64\%) contains predicates that are highly contextual and do not exhibit a conventionalised relationship between form and meaning. That is, the signers make more use of non-conventionalised, highly productive signs than of signs that are fixed in terms of meaning in order to express verbal content. These highly productive verb signs are distinguishable from plain verb signs in that they can move in the signing space and hence can be modified, providing a visual gateway for the manual incorporation of grammatical features and systematic alignment of non-manual components. It is no coincidence, then, that fully lexical predicates comprise plain verbs that do not allow much, if any, movement in the signing space. This point is not, however, intended as a dismissal of plain verbs as unimportant. Fully lexical verb signs are clearly significant in the data analysed but contribute to the cognitive functioning of the language in a different way to that of partly and non-lexical verbs. The body-anchored locations of plain verbs often represent a specific semantic field in relation to the meaning of the sign. For example, signs located at the forehead correlate with knowledge (such as the verb signs KNOW and UNDERSTAND) and location at the chest represents emotion or feeling (for example, LIKE and UPSET).

In Johnston's (2012) study of lexical frequency in Auslan, it was found that two thirds of all sign types are fully lexical and the importance of these sign types is noted, as they "count and rank the major citable conventional signs of an SL" (ibid.: 178). Once the corpus of BSL is fully machine-readable, it will be significant to ascertain whether or not the frequency of partly and non-lexical signs reduces in the case of a count of all sign types in comparison to this count of a small number of verb signs only. Even then, it will still need to be born in mind that, as Johnston notes, annotations based on glossing is not a reliable guide to grammatical class and lexical frequency measures of both the gloss and the grammatical class are necessary for a fuller understanding of the lexicon as a whole.

A further finding based on the analysed data is that gestural signs function as verbal predicates to a much lesser extent than fully and partly lexicalised verb signs. The use of gesture, then, may serve a different function, some of which are suggested by Johnston in relation to signed discourse as a conceptualisation activity:

One can immediately see, therefore, that any stretch of text in Auslan makes use of a significant number of gestural elements. These are involved in regulating the flow of the interaction, conveying emotion and attitudes, engaging in enactments or mimetic behaviour (the signer acts out something rather than convey the same information using fully conventionalized lexical signs), or engaging in idiosyncratic minimally conventionalized representations (rather than using some conventionalized elements in a complex depiction).
(Johnston, 2012: 170)

The vast array of partly and non-lexical predicates in BSL enables the signer to make full use of spatial grammar and simultaneity, the syntactic process that were highlighted as significant in the literature review (chapter 2). A sign language with its greatest majority of signs at the lexical end of the lexicalisation continuum, in fact, would restrict the extent to which the sign language user can re-create, through enactment and depicting strategies, the conceptualised experience. Relationships among constituents within sentences, then, are dictated by the type of predicate used and its ability to exploit spatial grammar and simultaneity.

\subsection*{5.1.2 Clause types and frequencies}

The following results table (Table 5-3) and accompanying illustrative chart (Figure 5-2) indicate that independent, co-ordinated and subordinated clause structures occur significantly in BSL in order to combine CLU's into larger strings of signed discourse:

Table 5-3 Results of clause types and frequencies
\begin{tabular}{|c|c|c|c|c|c|}
\hline & INDEPENDENT & CO-ORDINATED & \multicolumn{2}{|l|}{SUBORDINATED} & \\
\hline TOKEN & SINGLE & COMPOUND & EMBEDDED & DEPENDENT & TOTAL \\
\hline BL13 & 8 & 21 & 7 & 10 & 46 \\
\hline BL14 & 6 & 22 & 7 & 11 & 46 \\
\hline BL15 & 27 & 21 & 14 & 12 & 74 \\
\hline BL16 & 17 & 32 & 28 & 23 & 100 \\
\hline BM7 & 5 & 26 & 19 & 18 & 68 \\
\hline BM8 & 17 & 36 & 24 & 44 & 121 \\
\hline BM15 & 3 & 8 & 4 & 24 & 39 \\
\hline BM16 & 7 & 16 & 16 & 12 & 51 \\
\hline CF9 & 6 & 17 & 9 & 9 & 41 \\
\hline CF10 & 9 & 14 & 12 & 17 & 52 \\
\hline CF23 & 3 & 5 & 3 & 2 & 13 \\
\hline CF24 & 3 & 6 & 5 & 14 & 28 \\
\hline L11 & 2 & 8 & 3 & 4 & 17 \\
\hline L12 & 2 & 3 & 0 & 3 & 8 \\
\hline L13 & 4 & 10 & 5 & 7 & 26 \\
\hline L14 & 10 & 15 & 2 & 8 & 35 \\
\hline M13 & 38 & 28 & 11 & 36 & 113 \\
\hline M14 & 9 & 30 & 21 & 15 & 75 \\
\hline M17 & 12 & 15 & 22 & 15 & 64 \\
\hline M18 & 35 & 39 & 16 & 30 & 120 \\
\hline N11 & 6 & 3 & 3 & 5 & 17 \\
\hline N12 & 10 & 28 & 9 & 20 & 67 \\
\hline N21 & 21 & 51 & 31 & 49 & 152 \\
\hline N22 & 13 & 27 & 8 & 18 & 66 \\
\hline BF15 & 7 & 31 & 29 & 17 & 84 \\
\hline BF16 & 8 & 28 & 14 & 19 & 69 \\
\hline BF21 & 18 & 25 & 11 & 24 & 78 \\
\hline BF22 & 3 & 38 & 22 & 40 & 103 \\
\hline G11 & 18 & 31 & 9 & 30 & 88 \\
\hline G12 & 43 & 31 & 33 & 62 & 169 \\
\hline G13 & 14 & 48 & 20 & 26 & 108 \\
\hline G14 & 27 & 64 & 35 & 58 & 184 \\
\hline & & & 452 & 682 & \\
\hline Totals & 411 & 777 & & & 2322 \\
\hline
\end{tabular}


Figure 5-2 Overview of clause types and frequencies

The results table above (Table 5-3) indicates that data analysed in this study comprises a high level of sentence complexity. While independent clauses, which stand alone and are isolated from other constructions, occur with some significance (at 18\%), the data is largely made up of constructions that are tied together either through the use of coordination or through subordinating strategies. With regards to complex clause combinations, subordination of information (at 49\%) is more prevalent than coordination in the data (33\%). As discussed in section 4.2.1, it is necessary to distinguish subordinated clauses into two types: embedded and dependent constructions. This sub-division enables the research to examine the extent to which subordinated relationships between CLUs are used to (1) embed one clause within another, in order to modify a noun phrase within the matrix clause or to function as a constituent of the matrix clause, or (2) connect one clause to another in a separate but dependent relationship, in order to function as a modifier of the verb of the whole matrix clause. As the following chart shows (Figure 5-3), dependency (at \(29 \%\) ) is a more common feature in this data than embedding (19\%), though the percentage difference is not vast. In continuing to answer the first research question, then, it is relevant to note that CLUs may stand alone but occur more frequently in a coordinated or subordinated relationship with other CLUs. The following diagram (Figure 5-3) illustrates this subdivision of subordinated constructions.


Figure 5-3 Sub-divisions of clause types and frequencies

\subsection*{5.1.3 Distribution of predicates and arguments}

This study has so far stated that the main syntactic processes that are central to BSL are simultaneity and the use of spatial grammar. We have also seen that the level of lexicality within each proposition influences the relationships among constituents: clauses containing partly and non-lexical predicates are more likely to move around in the signing space and who does what to whom is indicated by the direction with which the verb signs move or by the ability to incorporate (most often) the object into the predicate. Furthermore, syntactic relations may be influenced by the logical tendency to place the object of a depicting motion verb in a pre-verbal position. The following table (Table 5-4) and illustrative chart (Figure 5-4) indicates the ordering of predicates and arguments in transitive clauses (containing one object) in relation to the type of predicate they contain. The table also contains statistics related to the number of predicate-only constructions; while this data would usually not be included in a discussion of ordering of constituents, it is added here because the extremely high result indicates significance. Verbless clauses are not included in the table but counted at 1,131, another significant figure.

Table 5-4 Distribution of predicate and arguments across clause types
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & Plain & \begin{tabular}{c} 
Indicating \\
Direction
\end{tabular} & \begin{tabular}{c} 
Indicating \\
Location
\end{tabular} & \begin{tabular}{c} 
Depicting \\
Motion
\end{tabular} & \begin{tabular}{c} 
Depicting \\
Size\&Shape
\end{tabular} & Gestural & Total \\
\hline SVO & 208 & 103 & 32 & 46 & 4 & 10 & 403 \\
\hline SOV & 5 & & 8 & 16 & 7 & 4 & 40 \\
\hline OVS & & & & & 1 & & 1 \\
\hline OSV & 6 & 3 & 1 & 9 & & & 21 \\
\hline VSO & 9 & 2 & 1 & & & & \\
\hline VOS & 4 & 121 & 109 & 310 & 94 & 263 & 1,272 \\
\hline V-only & 375 & 607 & 230 & 151 & 381 & 106 & 280 \\
\hline Total & 6 & & & & & 1755 \\
\hline
\end{tabular}


Figure 5-4 Frequency of sign order types across the data

The table above (Table 5-4) shows clearly that SVO is the most typical ordering of constituents when both subject and object are overtly articulated in constructions containing plain and indicating location verbs. This type of distribution is found more often at the fully lexical end of the continuum, with 208 out of 403 tokens occurring in this order. Fully lexical verbs do not move in the signing space and so, when the central syntactic processes cannot be employed, sign order is an important strategy for indicating relationships in clauses. In addition, the analysis shows that only 50 out of the 403 SVO clauses appear in depicting predicates; the most typical syntactic structures for these predicate types is single constituent, verbal predicates or constructions where the subject or object is omitted or incorporated. Reversal of the SVO-type clauses to the OVS order is non-existent in the data except in one case out of the total 483 transitive clauses. Where both arguments are overt, there are 61 examples of verb-final clause structures, and these are found mostly with depicting motion predicates. A further finding is that verb-initial CLUs are very rare in the data, with only 18 examples, all of which are of either plain or indicating predicates. Clearly, then, there are syntactic requirements in BSL and the ordering of constituents is not strictly free. The next set of quantitative data, CLUs where only one of the subject/object arguments is present, sheds further light on the syntactic requirements of BSL.

Table 5-5 Distribution of single argument clauses across predicate types
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & Plain & \begin{tabular}{c} 
Indicating \\
Direction
\end{tabular} & \begin{tabular}{c} 
Indicating \\
Location
\end{tabular} & \begin{tabular}{c} 
Depicting \\
Motion
\end{tabular} & \begin{tabular}{c} 
Depicting \\
Size\&Shape
\end{tabular} & Gestural & Total \\
\hline SV & 163 & 78 & 43 & 106 & 28 & 93 & 511 \\
\hline VS & 25 & 5 & 5 & 3 & 3 & 1 & 42 \\
\hline OV & 35 & 18 & 23 & 30 & 19 & 35 & 160 \\
\hline VO & 346 & 149 & 68 & 113 & 14 & 33 & 723 \\
\hline Total & 569 & 250 & 139 & 252 & 64 & 162 & 1,436 \\
\hline
\end{tabular}

The results of this analysis (Table 5-5 above) reveal that where CLUs contain subject and verb only, such as intransitive clauses, or ones where the object is incorporated into the predicate or omitted, the subject typically appears in pre-verbal position, particularly in the case of plain verbs and those that depict motion. The post-verbal positioning of the subject in such constructions is extremely low and, when it does occur, appears largely with plain predicates. The analysis also found that where the predicate occurs in a transitive clause with an omitted subject, the object most typically appears after the verb; where the subject is non-overt and the object is placed before the verb, the distribution is fairly even across the predicate types.

The findings indicate that SVO (subject-verb-object) is the most typical order where the core of the CLU is a plain predicate, or one that indicates the direction of the predicate. While the subject also typically precedes the verb in the case of the remaining types, the object also often occurs before the verb, resulting in a common SOV ordering, or is omitted from the CLU. Towards the depicting/gestural end of the lexicalisation continuum, in fact, the tendency to omit both subject and object becomes greater and simultaneity becomes a major factor in indicating the arguments, rather than the order of signs. Analysis related to the fourth research question, concerning the effect on the syntax of the language by its morphological make-up reveals that the morphology enables this high level of ellipsis and simultaneous articulation of predicate and arguments, leading to less reliability on syntax. The findings, therefore, indicate that the predicate type motivates certain structures and these motivations are discussed and illustrated in the following section (5.2) dedicated to qualitative data.

\subsection*{5.2 Qualitative data: clause structures}

The intention of analysing the corpus in terms of qualitative measures is to gain insight into the distinctions between syntactic structures, and to achieve the richness of description that is facilitated by qualitative analysis and is necessary for this descriptive overview of BSL syntax. Analysis of the structures through which the fully lexical and partly or nonlexical predicates are expressed reveals the syntactic nature of BSL as comprising a multilayered, cognitively-oriented arrangement of manual and non-manual features, which combine and superimpose to produce well-formed linguistic constructions. It is clear from the data analysed that, in answer to the first research question, a clause can contain any of the three sub-sets of predicate signs: fully lexical predicates (FLP), partly-lexical predicates (PLP) and non-lexical predicates (NLP). The following examples illustrate the syntactic arrangement of BSL, beginning with analysis of internal CLU constituents (section 5.1.2.1) and then moving to analysis of relationships between CLUs (section 5.1.2.2).

\subsection*{5.2.1 Constituents within clauses}

The examples in this section illustrate and aid the discussion of the internal structure of CLUs. A timely reminder here is that a clause is understood in this thesis as "a meaningful symbolic utterance unit that asserts something about the world by using one element in that utterance to predicate something about another element" (Johnston, 2013: 69).

\subsection*{5.2.1.1 Fully lexical predicate constructions}
(9)

> V : fully lexical construction with 0 arguments \(\therefore\) avalent
> Verb type: plain


This fully lexical plain verb (SHOCK), best described as monomorphemic (Sandler and Lillo-Martin, 2006), stands alone as a CLU. It cannot be modified spatially because its manual component is anchored to the body (and cannot, therefore, move around in the signing space). Simultaneous non-manual features include widening of the eyes, raised brows and a backwards tilt of the head: these non-manual features are an integral part of the sign, consistent with Aarons's (1994) first of two primary functions of non-manual markers, and are not optional, i.e. the sign SHOCK with neutral non-manual features would be ill-formed. These manual and non-manual features that make up the whole sign can be modified to intensify the extent of the shock (i.e. very or extremely shocked). Single-predicate clauses appear very frequency in the data and reflect a tendency in BSL for the subject and object of the verb to be omitted when they are apparent already in the discourse. Fully lexical predicates also occur with overt arguments in the data.

\subsection*{5.2.1.2 Partly lexical predicate constructions}
(10)


My father treated my mother to a caravan...
Corpus Reference: BL15n
\(>\) SViOdO : partly lexical construction with 3 overt arguments \(\therefore\) trivalent
> Verb type: indicating (directional)


The fully lexical verbal predicate (TREAT) in this example moves in the signing space, following the directions of the person giving the treat ( S ) and the person receiving the treat (iO) before the direct object of the verb is expressed. As with transitive plain verbs, fully lexicalised indicating verbs with a directional element often appear in SVO order in the data, with a tendency for the subject and the object to appear either side of the verb. The movement of the predicate seems to serve the purpose of assisting the addressee with information regarding who treated who, rather than any systematic verb agreement process here, as the locations (vantage points) allocated to the arguments change in line
with the signer's viewpoint as the discourse continues via use of mentally rotated space (Janzen, 2004). The relationships within this clause, then, are best seen in relation to the surrounding clauses in order to understand the syntactic use of space. The following diagram (Figure 5.5) helps to illustrate the sequence of clauses, which are best understood as a series of separate but related clauses (Slobin, 2003). In sum, the signer begins by signing FATHER then articulates a point (classed as 'ix' here, rather than PRO, as its function as a pronoun is not evident) across to the signing space opposite her and his position is maintained through the next two clauses. There are additional intervening clauses between clauses three and four so clause four serves to re-establish the information but the verb here begins to the left of the signer (indicating the mother) and its movement indicates to the addressee that the object (father) is still hypothetically located opposite (Liddell's 'surrogate space', 2003). The positioning of the father then shifts from neutral to the right of the signer in the next clause (clause 4) so a sequence that began with MOTHER in neutral space and FATHER opposite, ends with FATHER on the right and MOTHER on the left.
\begin{tabular}{|cclcc|}
\hline Clause 1 & FATHER & ix & HAVE & NEW BOAT \\
\hline Space & & Opposite & & \\
\hline Clause 2 & MOTHER & TREAT & Øfather & \(2^{\text {2 th }}\) anniversary \\
\hline Space & Neutral & \(\longrightarrow\) & Opposite & Neutral \\
\hline Clause 3 & Ømother & TREAT & Øfather & \\
\hline Space & Neutral & \(\longrightarrow\) & Opposite & \\
\hline Clause 4 & Ømother & TREAT & Øfather & \\
\hline Space & Left & \(\longrightarrow\) & Opposite & \\
\hline Clause 5 & FATHER & TREAT & MOTHER & CARAVAN \\
\hline Space & Right & \(\boldsymbol{k}\) & Left & Neutral \\
\hline Clause 6 & Øfather & TREAT & Ømother & \\
\hline Space & Right & \(\boldsymbol{k}\) & Left & \\
\hline Clause 7 & Ømother & TREAT & Øfather & \\
\hline Space & Left & \(\boldsymbol{y}\) & Right & \\
\hline
\end{tabular}

Figure 5-5 Series of clauses used with indicating directional verb TREAT
(11)



MATCH //
Corpus Reference: M18n
> SVO : partly lexical construction with 2 overt arguments \(\therefore\) divalent
> Verb type: indicating locational


We have seen in example (10) that directional indicating verbs indicate the subject and (in this case indirect) object of the action, i.e. who did what to whom. Analysis of the corpus found that there is a less frequently occurring set of verbs that also have an indicating function but indicate the location of an action, i.e. what occurred where, by articulating the sign in a specific part of the signing space. In example (11), the sign ME is followed by TAKE which is located at a height in the signing space that is level to the signer's chest, indicating that the match was taken from a surface at chest height. Later on in the
narrative, the signer reports that his father asked him where he got the match from originally and he answers KITCHEN CUPBOARD TAKE. Here TAKE is articulated high up in the signing space and to the left, indicating the exact location in real space terms of the cupboard while maintaining the 'pointing' function of indicating verbs. Cognitively, the verb TAKE evokes a person (taking something) and an item (taken from somewhere) but here the subjct is omitted. The addressee is easily able to select the signer himself as the subject, as this is established in the direction of the father's question in the previous clause.

This example has been chosen not only for its illustration of a locational indicating predicate construction but also because it contains a rhetorical question, a very frequently occurring feature throughout the 32 corpus samples chosen. Functioning as a wh-cleft in this case, the sign WHAT is held for a slightly lengthened duration (i.e. a pause) and occurs with parallel non-manual markers that distinguish it from a content question: widened eyes, raised brows and head tilted slightly upwards (as opposed to squinted eyes, furrowed brow and slightly lowered head). Wh-clefts in BSL, also known as pseudoclefts (Waters and Sutton-Spence, 2005), serve to place an argument in post-verb position to make it the focus of attention, and they occur in a single clause (Wilbur, 1994a, 1994b). In the case of locational indicating verbs, the object, in this case MATCH, would most frequently appear in a pre-verbal position in order to articulate what is being taken before logically describing the action, a process that illustrates a logical, cognitive orientation for a structure of this type. An example of this more frequent arrangement is found in M13n, with the clause FRIEND HOUSE STAY - the house is placed to the right of the signer and STAY is subsequently signed in that same location. The implication of wh-cleft constructions for the relationships within clauses is that a strategy exists in BSL for deviating from a usual structure by adding a wh-sign and marking the pseudocleft by an change in non-manual features. This demonstrates the fact that, as Liddell (2003) notes for American Sign Language, it "would be next to impossible to make sense of the ordering of constituents in ASL without attending to non-manual signals (P. 60). This will be made even clearer in the following examples, where we explore partly lexical constructions of a depicting nature and non-lexical predicates.
(12)

.../ ME

ca
FALL //
\(>\) SV : partly lexical construction with 1 overt argument \(\therefore\) monovalent
> Verb type: depicting motion


Depicting constructions involving motion occur frequently in the sample data. The typical principles for constructing clauses containing event motion in BSL involve using signs in a productive way that 'depict' the motion and/or location, i.e. articulate manual and nonmanual features that visually reconstruct the motion event. Cormier, Smith and Sevcikova (2013, in press) describe such articulations in their study as "whole or part entity depicting constructions when one or both hands were used to represent the location and/or motion of all or part of an entity". In this example (ME FALL), the left hand is held fully open and
flat to represent the broken pavement slab and the right hand, with the index and middle fingers protruding, represents the signer falling via a part-entity (i.e. legs to represent the whole body) depicting predicate that moves downwards. This is a common construction across many sign languages and Johnston and Schembri (2007) inform us that "the constituent order with depicting verbs of motion and location...reflect general cognitive principles in which the backgrounded, non-moving object (the ground) is produced first so that the foregrounded object (the figure) may be described in relation to it" (p. 206-207, emphasis in original). This again indicates that the visual cognition by which Deaf BSL users conceptualise meaning is a motivating factor for certain structures. This sign makes use of spatial grammar and simultaneity, and constituents in the clause work at the same time to depict the movement of the event. Johnston's (2013) explanation of depicting signs illustrates this syntactic process well:
...depicting signs often represent a complete 'state of affairs' and many may be regarded as CLUs in their own right. Each hand represents a participant/argument and the movement or placement of the hands represents an action or the relative location of the entities.
(Johnston, 2013: 33)
(13)


Corpus Reference: BL15n
\(>\{\mathrm{VS}\}\) : partly lexical construction with 1 internal argument \(\therefore\) monovalent
\(>\) Verb type: depicting size and shape
\begin{tabular}{|c|c|c|}
\hline \multicolumn{2}{|l|}{} & syn CLU \\
\hline sem & \(\left[\begin{array}{ll}\text { frame BLOWING } \\ \text { args } & \{\text { SAIL }\} \\ \text { dir } & \text { horizontal } \\ \text { nmf } & \text { es, pc }\end{array}\right]\) & \\
\hline \multicolumn{3}{|l|}{phon <SAIL BLOW>} \\
\hline & \begin{tabular}{cc} 
syn & \begin{tabular}{c} 
VP+NP \\
pred
\end{tabular} \\
sem & \begin{tabular}{l} 
args \\
dir
\end{tabular} \\
&
\end{tabular} & \begin{tabular}{l}
BLOW \\
\{SAIL\} \\
horizontal
\end{tabular} \\
\hline
\end{tabular}

As well as depicting the movement and/or location of an event, depicting predicates can also be articulated in a productive way to depict the size and shape of the argument that is being predicated (size and shape specifiers - SASS) and possibly the way that it is held (handling specifiers), though the classification of handling signs is currently a subject of debate (e.g. Pichler, 2002; Liddell, 2003; Johnston and Schembri, 2007). In example (13), the left hand of the signer lays horizontally across the signing space to represent the long, flat dimensions of the sea and the right hand is held upright and fully spread, representing the size and shape of the sail, i.e. the width and flatness of its surface; obligatory accompanying non-manual features include squinted eyes and puffed cheeks, frequently used manner and degree markers in many signed languages, which depict the vastness of the sail. Depicting size and shape signs such as example (13), and the previous motion and location depicting sign above (12), are classified as partly lexical primarily due to their meanings being very narrow and their articulation being very context-specific (Johnston, 2013), and also due to their close relation to gesture (Schembri, Jones and Burnham, 2005). With regards to the relationships within such constructions, the frequent exploitation of simultaneity for this sub-set of signs means that information about the argument is often incorporated into the predicate and does not need to be specified as a separate constituent as long as it has already been established in the discourse.

\subsection*{5.2.1.3 Non-lexical predicate constructions}

In the description of partly-lexical constructions, we have seen that the predicate and arguments may be comprised of productive, partly-conventionalised signs. Attention is now turned to the use of highly productive, non-conventionalised (i.e. fully gestural) predicates and the role they play in the syntax of BSL. The use of gesture in signed languages and whether they function as linguistic constituents or co-sign gestures is largely unclear. It suffices to state here that, if the long-standing notion of types of gestures is applied, such as Graham and Argyle's (1975) separation of iconic and arbitrary gestures, then the gestural element of BSL that is intricately woven into the other parts of the clause-patterning system is clearly arbitrary but there is no sense in supposing that BSL users do not make use of the additional, co-sign, iconic gestures also. It is relevant to note here that, in a discussion of pointing and its relation to gesture, Slobin (2003: 138) suggests that "the need to gesture comes from the need to construct cognitive mappings between entities within the semantic pole of a pronoun or verb and entities in real space" (also Slobin, 2004).

The use of isolated non-manual gesticulation (i.e. gestures without any lexical accompaniment) is very rare in the data, as gesture tends to occur more readily as part of 'constructed action' (Winston, 1991), as we shall see in the next example (14). However, there are some examples of singular use of non-manual gesticulation of a predicative nature. For example, BL13n (after a clause where she explains that her, her sister and their friends jumped into their car and locked it because four men were chasing them) signs ME then a non-manual only gesticulation consisting of the head moving from left-to right, meaning 'look-around-in-shock'. This serves as the predicate in the clause but its implications for syntax are minimal and so non-lexical predicate constructions are only examined via periods of constructed action in this study.
 The wasps flew all over me

Corpus Reference: G11n
\(>\{\mathrm{SVO}\}\) : non-lexical construction with 2 internal arguments \(\therefore\) divalent
> Verb type: gestural


Periods of constructed action are very frequent in the data, often penetrating clauses containing lexical or partly lexical predicates, stretching across whole CLUs in some and occurring at intervals in others, or functioning as full predicates in a CLU. This fluctuation, syntactically, is accounted for by the 'show' and 'tell' nature of sign languages noted by Johnston (2013):
...signers frequently 'show' a meaning through depiction and enactment, rather than 'say' it in an utterance encoded primarily though lexis and morpho-syntax. (Enactments are displays, citations or recreations of actions or utterances and are referred to in the SL literature as constructed action or constructed dialogue.) Indeed, Auslan often appears to use a complex combination of both strategies in a single utterance unit.
(Johnston, 2013: 50)

In example (14), the signer manually enacts the physical action of the wasps flying out of the nest and landing all over him, and simultaneously non-manually enacts the feelings associated with such an experience too. Constructions such as this again demonstrate the simultaneous nature of BSL. With regards to the ordering of constituents, where the constructed action of the predicate and its effect on its arguments are not articulated simultaneously, there is a tendency for arguments to appear pre-verbally and the constructed action predicate to appear in clause-final position. This simultaneity motivates a different structure to that most typically used with fully lexical predicates.

\subsection*{5.2.2 Relationships between clauses}

The previous section paid attention to the typical predicate structures that appear in BSL and compared the ways that the internal constituents within them are organised. In this section, the main syntactic processes for relating clauses to each other are considered. Analysis of the data samples shows that CLUs can combine at a simple level, i.e. coordinating clauses, and also operate on a complex level, i.e. subordinating CLUs, namely embedding and dependency. The following examples illustrate the typical patterning found in the data for combining CLUs in BSL.

\subsection*{5.2.2.1 Compound clause constructions}



There are many episodes of signing in the data where clauses are clearly related to each other and the frequent tendency to omit both subject and object arguments, through ellipsis, ties CLUs even more closely together, such as those in Figure 5-5 in section 5.2.1.2 Coordination of clauses into one proposition is a frequent pattern in the token samples analysed and consists of any combination of predicate types: two of the same type (i.e. two fully-lexical, two partly lexical or two non-lexical predicate constructions) or a combination of two different predicates from any of the three types (such as in example (15) here, where a locating indicating predicate (PINCH) is coordinated with a partly-lexical depicting verb (RUN-OFF). One of the key features for coordinating CLUs of equal status is a slight pause followed by a body shift in between the two conjoins (i.e. use of space to establish the two units separately). In example (15) two clauses, one indicating that the cat (previously established in the discourse) pinched the sausage and the other depicting the fact that the cat then ran-off, are coordinated by a slight pause in signing and a body shift from right to neutral space to make a compound construction in which both CLUs predicate the same omitted argument - the cat. Both clauses, when meaning and articulation are taken into account, clearly belong to one utterance unit.

In addition to non-manually marking a coordinated relationship between CLUs, signers in the data also make some use of manual coordinating conjunctions, mostly derived from English, such as BUT, OR and SEEM, which are all used in the data but much less frequently. There is also very little use of what Waters and Sutton-Spence (2005) refer to as solo mouthing, where words such as 'but' or 'and' are mouthed without
an accompanying manual sign. An example of two equal status conjoins coordinated by the sign BUT is taken from data token BF15n:
 with fully-lexical predicate constructions; signing that makes more use of constructed action tends to also make more use of non-manual coordination.

\subsection*{5.2.2.2 Embedded clause constructions}



A frequently occurring construction in the data is one where one CLU is embedded within another, i.e. a contained CLU is situated 'inside' a matrix CLU comprising both the container clause + the contained clause (following Johnston's (2013) descriptions). The contained clause in BSL functions in much the same way that embedded clauses do in other languages, that is, they serve either to modify the matrix clause or function syntactically as a constituent of it. The embedded CLU in example (17) [GO d-o-n-n-e-I-I-y-c-a-s-t-l-e] is functioning as the complement of the matrix clause verb, DECIDE; hence the embedded subordinate CLU is functioning as a constituent of the matrix CLU and is a complement argument clause. As there is no manual subordinating conjunction, the embedded CLU is separated from the rest of the matrix CLU by similar non-manual features to those noted in the case of coordinating conjunctions (a slight pause and body shift) and largely by its juxtaposition with the contiguous CLU. As with coordinating CLUs, a subordinated CLU can consist of any combination of predicate types: two of the same type (i.e. two fully-lexical, two partly lexical or two non-lexical predicate constructions) or a combination of two different predicates from any of the three types (such as in example (17) here, where a non-lexical predicate (GO) is embedded inside a matrix clause containing a fully lexical predicate (DECIDE).

There are many examples of embedded complement arguments in the data. This is a feature of BSL that is used particularly for expressing utterance + enactment constructions (akin to direct quotations), such as those noted in Johnston (2013: 56) for Auslan. In such cases, the embedded enactment stands as an entire clause and may be introduced by a manual predicate, such as TELL in example (18) below from BM8n, or by its non-manual counterpart (slight pause + body shift), such as example (19) from G14n:

(19)


In addition to embedded complement arguments, a regularly used feature in the data is the embedded relative clause, which typically serves as a modifier of a noun phrase within the matrix. Rather than establishing the information contained in the relative clause as a compound clause (i.e. coordinated), the signer has chosen to articulate the information as an embedded modification (i.e. subordinated). In section 5.2.2.1 it was noted that a slight pause followed by a body shift in between two conjoins is a typical strategy for coordinating CLUs; in the case of relative clauses, it is also non-manual features that
typically indicate the clause relationship but here the pause and body shift is accompanied by a backwards head tilt, which combines with the other non-manual features to mark its grammatical function. Liddell (2003) also found that relative clauses (in ASL) are nonmanually marked, and there are no relative clauses in the data analysed for this study that make use of a manual relative marker. In the following example, signer N12n articulates the following non-restrictive relative clause (20), where the verbless clause SAME SCHOOL NEWCASTLE modifies the antecedent noun phrase (DEAF GIRL) and is embedded within the matrix clause:


OTHER


DEAF


GIRL


Pause+shift+htb
[SAME
There was another
There was another deaf SCHOOL NEWCASTLE]

\subsection*{5.2.2.3 Dependent clause constructions}
(21)



We had to go to China first because you can't fly straight to North Korea
Corpus Reference: N21n


In the discussion of example (21), it was noted that a subordinated CLU may be embedded inside a matrix CLU in BSL via juxtaposition and a change in non-manual marking. Analysis of the data also indicates that a subordinated CLU can perform a dependent function and such constructions appear frequently in the data. The subordinate CLU in this example (THROUGH FLY STRAIGHT KOREA CAN'T) is functioning as a "connective of reason" (Waters and Sutton-Spence, 2005: 10). As Waters and SuttonSpence note, in this type of subordinate CLU, "one conjoin is the logical outcome of the other" (ibid.) and the reason for the outcome (i.e. there being no direct flight to Korea) is always situated to the right of THROUGH, as is the case in this example. Subordinating CLUs are frequently introduced by a manual sign, such as THROUGH or BECAUSE, in
the data, although the option to articulate a dependent CLU by virtue of juxtaposition only is possible.

Like coordinating compound constructions (seen in section 5.2.2.1) and subordinating embedded constructions (as in section 5.2.2.2), dependent subordinating constructions can consists of any combination of predicate types: two of the same type (i.e. two fully-lexical, two partly lexical or two non-lexical predicate constructions) or a combination of two different predicates from any of the three types (such as in example (21) here, where a fully-lexical predicate (FLY) is dependent upon a matrix clause where the verb 'go' is not overt. Analysis of the data also indicates that dependency enables conditional constructions to be expressed in BSL. Conditional constructions are typically marked non-manually by raised brows and a backwards tilt of the head over the subordinate clause, though there are times in the data when the conditional clause begins with a subordinating conjunction, i.e. the lexicalised fingerspelt sign I-F. The following example (22), taken from token N21n, illustrates this function. Here the sentence-initial subordinate clause (IF ME IGNORE THAT) describes the 'condition' that may lead to the possible event (WILL BAD TROUBLE) expressed in the main clause:


\subsection*{5.3 Conclusion}

The central focus of this research has been a process of identification, description and analysis of clause structure in British Sign Language. The research project has proceeded with caution due to the limited description of BSL syntax available and the inherent difficulty in assigning grammatical classes, and in turn syntactic processes, to the features of the language. It is clear from the analysis, however tentative it may be, that British Sign Language is a well-developed, sophisticated language with a rich syntactic system suited to the natural cognitive functioning of Deaf people. The complex interrelation of manual and non-manual features, and the intricate use of the signing space, allows the signer to construct meaningful articulations of events and experiences.

With regards to the first research question related to the types of syntactic structures found in BSL, analysis of the data has found that utterance units comprise simple or complex constructions made up of fully lexical, partly lexical and/or non-lexical predicates, which combine in various ways to express arguments. The constructions have been noted as best understood as posited along a lexicalisation continuum, where fully lexical predicates are highly conventionalised with regards to the relationship between form and meaning, partly lexicalised predicates are less conventionalised and rely on context for their correct interpretations, and non-lexical predicates are fully contextualised, non-conventionalised gestures. In the case of all predicate constructions, signers have the option to employ any combination of the three predicate types when combining CLUs, and these combinations facilitate the capacity to express compound, embedded and subordinated constructions. Furthermore, signers may employ manual or non-manual means in order to mark constituents. Paying explicit attention to the number of arguments controlled by a verbal predicate, this study has also shown that the three predicate types can make use of any of the number of argument combinations.

Having established the typical structures present in the data, the analysis next examined the frequencies of the predicate types and clause structures in order to answer the second research question. It is possible to conclude that all grammatical structures occur with significant frequency across the data, though the findings have shown interesting results. Significantly, \(64 \%\) of the constructions examined contain predicates that are either partly lexicalised or non-lexicalised, and this includes a fairly even distribution of indicating and depicting verb signs, and less use of gestural predicates. In terms of clause structure, a large amount of the data (49\%) is made up of complex subordinated constructions, with
slightly more dependent CLUs than embedded ones infiltrating the data. A further (33\%) of the data comprises coordinated CLUs and both coordinated and subordinated constructions can be marked manually or non-manually. The signers also make use of independent, single constructions and this counts for the remaining 18\%.

The ordering of arguments is of particular interest, as the data reveals a tendency for fully lexical predicate constructions that contain transitive plain or indicating directional verbs to appear in SVO order, i.e. a tendency for the subject and the object to appear either side of the verb. In the case of the partly lexical constructions, the constituent order of constructions containing depicting verbs of motion and location, or size and shape specifiers, have been noted as reflecting general cognitive principles, as the backgrounded, non-moving object (the ground) is often produced first so that the foregrounded object (the figure) may be described in relation to it, hence an order of either SOV or OSV. This visual orientation places the object in a pre-verbal position, before the action/experience, in order to articulate what is being acted upon/experienced before the event takes place, influencing this different ordering of constituents and answering the third research question. It was also noted that non-lexical predicate constructions frequently exploit simultaneous functions, where arguments are head-marked (Slobin, 2008) by being incorporated into the verb do not need to be overtly specified. Examination of periods of constructed action has also shown a tendency in BSL for the subject and/or object of the verb to be omitted when they are apparent already in the discourse, or can be inferred from the utterance or wider discourse context, and this must be taken into account when considering the syntactic structure of CLUs. With regards to the fourth research question, then, the morphological make-up of BSL, i.e. the high use of simultaneity and spatial grammar, enable verb-only and verbless constructions to be very frequent in the data. Clearly, then, the preferred syntactic structure depends on the content of the clause and on the amount of overt arguments specified. In fact, in the case of the small data-set analysed for this study, it appears that there may be no single preferred sign order and that various orders are necessary for the expression of grammatical relations.

While this study has dealt with predicate construction types and combined clause types as single entities, it is important to note in this conclusion that signers continually combine the available linguistic configurations into complex depictions and enactments that exploit the visual-gestural modality to the full. It is also evident that non-manual features play a crucial role in the syntactic make-up of BSL, with head and body movements, certain facial expressions, and pauses working to mark syntactic relations
within CLUs and among combined CLUs also. As the future brings further advances in our understanding of the make-up of sign languages, and deeper insight into the natural cognitive orientation of Deaf people towards those languages, this study can only conclude with the hope that deaf children of the future will be afforded the option of acquiring their native language, for language is the greatest gift we can give.

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\section*{Appendix 1 - Full Metadata Record}

\section*{BL13+14n}
\begin{tabular}{|c|c|}
\hline Title: & BL13+14n \\
\hline Identifier: & BL13+14n \\
\hline Creator: & British Sign Language Corpus Project \\
\hline Subject: & CAVA Repository \\
\hline Subject: & BSLCP \\
\hline Date: & 2009-01 \\
\hline Identifier: & BL13+14n \\
\hline Content Genre: & One:One \\
\hline Content Subgenre: & Adult and Adult \\
\hline Content Communication Context: & Narrative \\
\hline Primary Actor ID: & BL13 (Right), BL14 (Left) \\
\hline Primary Actor Age: & BL13 26, BL14 29 \\
\hline Primary Actor Sex: & BL13 Female, BL14 Male \\
\hline Primary Actor Occupation: & BL13 Dog walker, sign language teacher, BL14 Unemployed \\
\hline Primary Actor Notes: & BL13: Native signer \\
\hline Primary Actor Condition: & BL13 \& BL14: Deaf \\
\hline Primary Actor Family History: & BL13 Grandparents, parents and siblings (deaf), BL14 None \\
\hline Primary Actor Handedness: & BL13 \& BL14: Right \\
\hline \begin{tabular}{l}
Primary Actor Sign Language \\
Experience:
\end{tabular} & BL13 \& BL14: <7 (age of acquisition) \\
\hline Primary Actor Education Model: & BL13: Primary school (sign, speech, sign \& speech), secondary school (sign, speech, sign \& speech), BL14: Primary school (sign \& speech), secondary school (sign \& speech) \\
\hline Condition Onset: & BL13 \& BL14: Born deaf \\
\hline Country: & United Kingdom \\
\hline Location: & Bristol \\
\hline Number of languages: & 1 \\
\hline Sign language: & BSL \\
\hline Communication modes: & Cultural gestures, Deictic gestures, Enactment, Eye gaze, Signs \\
\hline School type: & BL13: Primary school (for the deaf, PHU), secondary school (for the deaf, mainstream), BL14: Primary school (for the deaf), secondary school (for the deaf) \\
\hline Age Group: & BL13 \& BL14: 20-40 \\
\hline
\end{tabular}

\section*{Appendix 2 - CAVA Consent Proforma}

Consent for participant (adult) to be recorded + recordings archived and used for future research and teaching
NB If the adult has a communication disorder, the content of this form must be presented to her/him in an accessible format.

\section*{CONSENT TO BE VIDEOIAUDIO-RECORDED, AND FOR STORAGE AND FUTURE USE OF DATA}

Please initial box
I agree to be video/ audiotaped for this project.
I know that my video/audiotapes will be stored in the UCL human Communication AudioVisual Archive (CAVA) held at the UCL Library:

\section*{Initial one box only to show how long you want recordings to be kept for}

EITHER
2a) For as long as the Library exists, for future research. I know that
future researchers will sign a CAVA Repository End User Licence Agreement to respect my confidentiality, rights and dignity, and use my data in a responsible way.
OR
2b) until the project team have finished their work in [date]. Then they will be destroyed.
3. I know that when the project team labels my recordings, writes articles and talks about the project they will use a false name, not my real name.
4. I agree that my data can be used for presenting research findings (e.g. at conferences); for further analysis in future research projects [and/or for teaching purposes].
5. I know that the information collected about me may be audited by the research sponsor, [name], to check that the research is being conducted properly.
Name of participant \(\qquad\)
Signature
Date
http://www.ucl.ac.uk/ls/cava/docs/consent-form-adult.doc

\section*{Appendix 3 - Annotated data}

\section*{A3.1 BL13n}



\section*{A3.2 BL14n}



\section*{A3.3 BL15n}




\section*{A3.4 BL16n}






\section*{A3.5 BM7n}




\section*{A3.6 BM8n}





\section*{A3.7 BM15n}



\section*{A3.8 BM16n}




\section*{A3.9 CF9n}



\section*{A3.10 CF10n}
```

1
2//ME HAVE CAT// START BABY 8 WEEK OLD // ME HOME/ME LAUGH ix3 // [ME TRY
3//S V O // V O // S V / S V O // S V
1
2 [RELAX COMPUTER]/ CAT COME / LOOK SCREEN COMPUTER / TOUCH / [TRY [CATCH
3[O]V / S V / V O / V / V [O]V
1 ca
2 MOUSE]// ME LAUGH // PAT / MOVE / PUT-DOWN // COME-BACK / [LOVE [PLAY]// ME
3 O // S V // V / V / v // V / V [O] V // S
1
2 LAUGH ix3 // NEXT LATER GROW / ME PLAY++ / RUN-AROUND / BALL THROW / FETCH //
3 V O // V / S V / V / O V / V //

```



\section*{A3.11 CF23n}


\section*{A3.12 CF24n}
```

1
2//[KNOW [ix3 p-r RABBIT 8 LAST-WEEK LOSE 8]// [LOSE 8 [POSSIBLE]/HAPPEN n-o-r-t
3// V [O] S O V // V O [O] N/O / V
1
2 h-a-m-p-t-o-n AREA // NOW RECENTLY THERE f-o-r-d THERE 8/b-u-t LOOK/BIT CRUEL/
3 // N/O / V / N/O /
1
2 ALL LIKE PUT-IN/STRANGLE / DIE // NOTHING GUN NO ix3 // SAME SHUSH POACH /
3 O V / V / V // N/O // V /
1 but-mp
2 CRUEL/[ WORK [p-r NEVER CONTINUE]// [KNOW [PREGNANT++]/RABBIT PREGNANT /
3 N/O / V [O]S V // V [O] N/O / N/O /

```
```

1}2\mathrm{ FOLLOW _?_ FINISH // j-a-n-u-r ix3 BORN / f-e-b-r-u-a-r-y BORN /m-a-r-c-h BORN / a-p-r
3 V -?- // O S V / O O V / O V / O
1
2 BORN / m-a-y STOP // j-u-n-e STOP //j-u-l-y STOP / a-u-g SEPTEMBER OFF++ / CATCH++ /
3 V / O V // O V // O V / O O V / V /
1_rhq
2 WHY i-f MAYBE j-u-n-e CATCH / OPEN / THERE BABY / LOOK AWFUL // BETTER ALL MUST //
3 O V / v / N/O / v O // N/O //
1 _aff
2 i-f POLICE CATCH/WILL FINE 200 t-o 500 POUND FINE// ME AGREE/WHY VARY/
3 S V / V O // S V / V /
1
2 BECAUSE [KNOW [LINK _-?_]// UNDER LIKE FRESH // OTHER THERE NOTHING / OLD
1
2 BRING // SMELL AWFUL // MUST FRESH // [YOU KNOW [OPEN / RED INSIDE / HARD TEAR] //
3 V // V O // N/O // S v [O] V / N/O / O V //
1
2 FRESH RECOGNISE EASY //
3 O V //

```

\section*{A3.13 L11n}



\section*{A3.14 L12n}



\section*{A3.15 L13n}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{11}{|l|}{1 //ME FIMSH WORK // ME WALK HEAVY BAG BOOK + ix3 CHILDEN SChOOL BOOK //} \\
\hline 2 //ME & FINISH & WORK // ME & WALK & HEAVY BAG & BOOK++ ix & ix3 & CHILDREN & SCHOOL & & \\
\hline \(3 / / \mathrm{S}\) & V & O // S & V & \(\bigcirc\) & 0 & & & & & \\
\hline 1 & & & & & & & & & & \\
\hline 2 [ME & MARK [W & ANT HOME]// & / PUT-IN & N / WALK / TH & EN SLAB J & JUT-U & -UP / ME FALI & FALL / BAN & NG- & -FA \\
\hline 3 S & \(\checkmark\) [O] & V O // & / V & / V / & S & & V / S & V / & & \(\checkmark\) \\
\hline 1 & & ca & & & nmf & & & & & \\
\hline 2 BAG & FALL / BO & OOK SCATTER & // PEOP & LE-PASS / ME & STUN // G & GET-U & -UP / [SOME & E HELP [PI & PICK & K-U \\
\hline 3 S & V / & S V // & // & V / S & V // & V & \(\checkmark / \mathrm{S}\) & V [0] & [0] & V \\
\hline
\end{tabular}


\section*{A3.16 L14n}



A3.17 M13n





\section*{A3.18 M14n}
```

1
2//[ME REMEMBER ME [SOME-TIME-AGO ABOUT FEW YEARS AGO MY FRIEND IN
3 // S [O] S
1
2 PRESTON FRIEND GO [WORK ix3]// THAT TIME STUDY ME // ME STRESS / LIVE DEAF ix++ /
3 V [O] V S // V S // S V / V O /
1__n nmf that's-mp

``` \(\qquad\)
``` cd
2 BOTHER++ // [NEED [FOCUS / STUDY / EXAM COME] / [WHY [LEAVE ME] // [TAP FRIEND
3 V // V [O] V / V / S V V / N/O [ V O ]// V O
1
CAN ME USE YOUR _cd+q _cd
2 [CAN ME USE YOUR HOUSE / STAY // [FRIEND [FINE]// PERFECT ME STAY // xi3 GO
3[O] S V O / V // N/O [N/O]// S S V // S V
1 __nmf
2 WORK // [ME TRY [STUDY / TYPE]/LATER ME HUNGRY / ME FANCY WANT CHIP ME //
3 O // S V [O] V / V / N/O / S V O //
1
2[SO GO [CHIP PUT OVEN]// [ME BACK [TYPE]/[ME REALISE [REALLY WANT BREAD]/
3 V [O]O V O // S V [O]V / S V V [O] V O /
1
                        neg _nmf
                                    mcs
2 [LOOK [NO BREAD NOTHING AHH // SHOP NEAR THAT'S-IT // CHECK CHIP / LOOK
3 V [O] N/O // N/O N // V O V
1
```

$\qquad$

``` mcs
2 ALRIGHT / BECAUSE SHOP NEAR THAT'S-IT // ME OUT FINE / CLOSE-DOOR PERFECT //
3 O / N/O // S V / //
1
2 WALK / BUY BREAD BEEN // WALK BACK / FEEL-POCKET / NOTHING KEY NOTHING // [ME
3 V / V O // V O / V N/O / N
1 that's-mp
2 THINK [IMPORTANT CHIP ix3]/ [WHY [THINK FIRE]// MY FRIEND GO WORK //
3 V [O] N/O / N/O [ V O // S S N //
1
2 THAT TIME NOTHING MOBILE // [ME THINK [WHAT-DO]// [ME KNOW [FLAT ix3
3 N/O // S V [O] V // S V [O]
```



```
1
2 EMBARRASS // ME OUTSIDE / WALK/LOOK/SEE KEY // ME SHIT STAND-ON-KEY MUST /
3 V // S V / V / V / V O // S /
1
2 ME PICK-UP CAN'T // MUST STAND-ON // ALRIGHT GO / PLEASE GO / THANK-YOU COME //
3 S V // V // V / V / V //
1
```

$\qquad$

``` cd ca
2 ALRIGHT / OFF // ME LOOK / [MAKE-SURE [PEOPLE IN++]// ME PICK-UP / BAD EMBARRASS //
3 N/O / V // S V / v [O]S v // S v / v l / 
1
2IN / SHUT-DOOR // SHIT++ HAVE-TO INFORM FRIEND / BECAUSE DOOR DAMAGE // ME
3 V V // V O / V S V // S
1
                                    mcs
2 WAIT++ / [TRY [CARRY-ON [TYPE]/ FRIEND HOME/GO-MAD / SCOLD // [ME [SORRY]//
3 V / V [O] V [O] V / S V / V / V // N/O[ N/O ]//
```


## A3.19 M17n





## A3.20 M18n






| 1 |  |  |  |  |  |  | ca |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 [WIFE | E TELL | [DAU | UGHTE | ER ix3 | PLAY | MAT | TCH] | // [REM | MEM | MBER |  | BEEN |  | ATHER | TEACH] | // [ | [NOW |
| 3 S | V | [0] |  | S | V |  |  | // |  |  | [0] | O] |  | S |  | // |  |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 ME D | DAUGH | TER |  | SHOW | [SAME | E ix3] | 3] // | THEN | MY | s-o |  | SAM | E / | / FROM | HAPPE | // |  |
| 3 S | $\bigcirc$ |  |  | V | [0] | N/O | // |  |  | N/O |  |  | ) |  |  | // |  |

## A3.21 N11n




## A3.22 N12n






## A3.23 N21n









## A3.24 N22n

```
1
2 //ME FRIEND [WHEN ME SCHOOL] NAME s-u-s-a-n-g-o-o-d-w-i-n // MY PAL YEAR++/
3 // N/O- [ N/O ] -N/O N/O /
```





## A3.26 BF15n

```
1
2 //ME LAST YEAR SUMMER a-u-g _?_ b-b-c b-l-a-s-t / LINK WITH n-d-c-s ix3 FILM
3 //
                    N/O / V
1
2 PROJECT ix3 // ME GO/ME SIT / PRESENT STORY [WHAT DO THROUGH 1 WEEK]// ME
3 // S V/ S V / V O [O] V V O N
1 1 / \mp@code { m c s }
2 SIT // [ME SEE [2 GIRL WALK / ARRIVE LATE]// ME LOOK-UP-DOWN OOH / 2 PASS-BY /
3 V // S V [O] S V / V // S V V S N V /
1
2 ME WHATEVER // [TIME-PASS THEY TELL [WORKSHOP DIFFERENT GROUP++]/[ME [OK]//
3 N/O S V [O] N/O N/O [N/O]//
1
2 ME SIT WITH NS:CURLY-HAIR/[ME THINK [ix3 INTERPRETER ix3 NS:CURLY-HAIR/ME
3 S V O / S V [O] N/O S
1
2 SIT // 2 GIRL COME-ROUND / SIT-NEXT-TO-ME // ME LOOK / MAYBE BEEN SEE BEFORE //
3 V // S V / V // S V / V O //
1 [\mp@code{_rhq }
3 V [O] N/O / N/O [N/O ]// N/O // N/O [N/O]// S
1
2 TELL [NAME t-i-m]// [AFTER THAT 2 ALL-THROUGH WANT [KNOW [LEARN SIGN
3 V [O] N/O // S V [O] V [O] V O
1 __cd
2 MORE]/LIKE LINK DEAF EMPATHY // [ME [FINE]/TEACH SIGN / BUT THEY DON'T-
3 / V O // N/O [N/O]/ V O / S
```




## A3.26 BF16n

```
1
2//[KNOW [WHEN ME SMALL/WANT DOG SMALL WANT++]// MOTHER-FATHER NO/
3// V [O] N/O / V O // N/O /
1
        mcs
2 [TELL [BECAUSE DON'T-CARE / MOTHER-FATHER LOOK-AFTER]// MINE // ME PATIENT /
3 V [O] V / S V // N/O // N/O /
```





## A3.27 BF21n






## A3.28 BF22n

```
1
2 //LAST WEEKEND FRIDAY NIGHT GO BED LATE / SLEEP // WAKE-UP TIME 6-O-CLOCK /
3 // V O / V // V O /
1
2[FATHER SHAKE [GET-UP / 6-O-CLOCK]// ME WAKE-UP MOOD BAD MOOD // GET BAG /
3 S V [O] V / N/O ]// S O V O O // V O /
1 then-mp
2 IN CAR READY // ARRIVE FERRY / TRAVEL SCOTLAND / HELP m-a-p / WHERE GO ix3
3 V O // V O / V O N / V V N / N
1
2 n-c // TRAVEL / AT-LAST ARRIVE n-c ABOUT 12 1-O-CLOCK ABOUT // SISTER ix3 EXCITE /
O // V / V O // S V /
```





```
1 __mcs
2 COME AT-LAST // OFF HOME / QUICK HURRY HOME //
3 V // V / N/O //
```

A3.29 G11n

```
1
2//ME TALK ABOUT d-o-n-n-e-I---y SCHOOL ix3 // REALLY t-e-a-c-h-e-r TEACH POOR //
3// S V O // S O //
1}2\mathrm{ GROW-UP / TEACH NO SIGN ORAL/b-u-t STILL MISUNDERSTAND // WRITE ix3 / BECOME
3 V / V O O / V // V S/
1
2 WOMAN HALF-HOUR ix3++ //TEACH // YOUR HUSBAND SAME ME ix3/TEACH POOR
3 N/O // V // N/O / V O
1
2 YEAR++ // SOMETIME GOOD / PLAY FOOTBALL SNOOKER GOOD / b-u-t TEACH POOR //
3 // N/O / V O / N //
1
2 SCHOOL ME IN/BREAK LUNCH BREAK SOMETIME GO OUTSIDE/ALL PLAY FOOTBALL//
3 O S V/ V O / S V O //
1 ca
```

$\qquad$

```
2 FIELD SLOPE / RUN-SIDEWAYS++ // FOOTBALL SIDEWAYS EVERYDAY // NOT-BOTHER / RUN
3 N/O / V // N/O // V / V
1 ___neg
2 NOT-BOTHER // FOOTBALL ROUGH DIRTY /TACKLE // ME IN / SEE BUSH++ // ME PLAY
3 // N/O / V // S V/ V O // S V
1
                                nmf
2 GOAL-KEEPER / ix3 FEEL WARM-ARM++ // ME LOOK/JUMP / WASP-NEST // [ME TELL
3 O / O V O // S V / V / N/O // S V
1 __cd
                                    ca
2 DEAF / WAVE [NO++]/ BALL ix3 KICK/HIT/FLY-ALL-OVER // ALL-OVER // ME SHORT / ON
3 O / V [O]N/O/ O S v / v / V // N/O // N/O / V
1
2 LEG++ / SHORT-SLEEVE / ON ARM++ // RUN++ UPHILL / RUN / WASP++ ATTACK // RUN / IN //
3 O / N/O / V O // V / V / S S V // V / V //
```





## A3.30 G12n



```
1 2 DOCTOR // FINE // NO NO MEDICINE _-nOOD / SAME COUGH // [CAN HEAR [ME COUGH]//
3 O // N/O // N/O / V // v [O]S V //
1
2 PUT-ASIDE / [ANOTHER TABLET TRY [f-o-r CONTINUE / IMPORTANT STRONG] // STRONG
3 V / O V [O] V / N/O //
1 _ca
2 FINE // HOME / TAKE / SAME COUGH++ // LATER THINK ME CHEST / DON'T-KNOW // NEXT-
3N/O// V / V / v // v S O / V //
1
2 WEEK GO/[DOCTOR ASK [YOU EVER w-a-s SMOKE]// [ME [NEVER MY LIFE SMOKE
3 V/ S V [O]S V // N/O[ O O
1
```

$\qquad$

``` cd
2 NEVER MY LIFE]// NEVER MENTION ALL-THIS-TIME/NEVER STOP // WAIT/WILL ME
3 // V / V // V / S
1
                cd
2OTHER 1 BRING/PILL DIFFERENT THROW /OTHER 1//[MEAN [ME INSIDE MIX-UP PILL
3 O V / O V / N/O // V [O]S V
1
2 DIFFERENT++]/[MIX-UP [THINK]/s-o PUT-ASIDE / OTHER TAKE TABLET DIFFERENT / OTHER
3 O / V [O] V / V / V O /
1
                                    cd
21 TABLET TAKE SAME //GO/[DOCTOR [BEST GO x-r-a-y f-o-r CHEST]// [CHEST ME
3 O V // V / N/O [ V O O l// O S
1 2 HOPE [ALRIGHT]// ME WANT ILL/BECAUSE CATCH BRONCHITIS COLD LUNG // DOCTOR
3 V [O]N/O // S V O/ V O O // S
1
2 POST/GO x-r-a-y PHOTO/WAIT t-i-I 4 WEEK// 4 WEEK IMPOSSIBLE/RATHER 1 WEEK
3 V / V O / v O // N/O / O
1
22 WEEK RECEIVE/[WANT [HEAR]// CAN`T WAIT t-i-I 4 WEEK/BECAUSE ME SLEEP STILL
3 V / V [O] V // V O / S
1
2 TOSS-TURN / THINK++ // BREATHE / HURT LUNG // ME FAMILY NOTHING / ONLY 1// \overline{WHAT}
3 V / V // V / V O // N/O / N/O //
```



```
1}2\mathrm{ NOW / PATIENT // 3 WEEK BACK APPOINTMENT WITH ix3 HOSPITAL s-c-a-n / ME FEEL-
3 O / N/O // V O / S V
1_mcs
                                nmf
2 SICK // SIT // LOT PEOPLE / SEEM TURN++ // FIRST NAME / ME FIRST-UP THANK-YOU //
3 // V // N/O / V // N/O / N/O //
1
2[THINK [ME WAIT]/[ME [THANK-YOU]/SIT // DOCTOR CHECK EVERYTHING // YOU
3 V [O]S V / N/O[ N/O ]/ V// S V V O // S
1 __cd+q ___cd never smoke-mp
2 SMOKE // NEVER SMOKE MY LIFE // CAN HEAR ix3 / ME NOTHING / // BETTER
3 V // V O // V O / N/O / V //
1
2 THUMB-PRICK BLOOD/THEN WAIT//ME GO/SIT// [ANOTHER DOCTOR DOCTOR TELL
3 V / V // S V/ V // S V
1
2[ME FROM PARIS SELF PARIS]/SKIN INDIA // SIT/TALK/[ME [ix3 c-c-a-n]// NEVER SAY
3[O] N/O / N/O // V / V / N/O [ N/O ]// V
1_cd+neg
```

$\qquad$

``` cd
2 s-c-a-n / AIR MOUTH PUMP // [ME [s-c-a-n THINK++ FOR NOTHING]/WASTE o-f MY
3 O / O V // N/O [ O V l | V O
1
2 TIME // BUSY YESTERDAY / ME BATH / CLEAN / HOPE GOOD FOR ix3 / NICE INSIDE ALL
3 // N/O / N/O / V / v O O N/O
1 ___cd
2 READY // s-o ME RUBBER IN-MOUTH // SPEAK/ME HEAR NOT/[INTERPRETER [NO ME
3 // S O V // V / S V / N/O [ S
1
```

$\qquad$

``` cd nod
2 EXPLAIN / ix3 DEAF] // DOCTOR // ME CAN EXPLAIN ix2 HIGH LOW / [ME [ALRIGHT] //
3 V / N/O ]// S V // S V O / N/O[N/O ]//
1
                                    cd
2 LIKE BATH SHOWER b-o-x BOX IN / SIT // CLOSE g-a-t-e CLOSE // [DOCTOR [NO OPEN] //
3 O V/ v // v O O // N/O [ v ]//
1 ____cd
2[THINK [ME BLOCK]/OPEN / THANK YOU // SIT // ix3 PLUG IN-MOUTH / CAN'T BREATHE /
3 V [O]S V / V / N/O // V // S O O V l l
```




## A3.31 G13n

```
1
2 //ME BEFORE RELAX // BEFORE ME MEET DEAF SO-ON // [HAPPEN [ME 2 DAUGHTER
3 // S V // S V O // V [O] S
1
2 GO [SWIM a-q-u-a m-WELL ix3] // RUSH // DROP-OFF / OUT / WALK / DROP-OFF //
3 \ [O]V O // V // V / V / V V / V //
1 2 ALRIGHT BYE/WALK / IN CAR // [SEE [SET-UP COMMUNITY SERVICE] / WHAT ME - - HAVE-
3 N/O / V / V O // V [O] V O O S
1
2 A-LOOK / WALK OVER // IN / TALK // MEET HEARING / WRITE BACK-FORTH++ // THIS DEAF
3 V / V // V / V // V O / V // N/O
1_cd+q _cd
2 CLUB // NO // WRITE MONDAY TO FRIDAY THAT-ALL // OH THANK-YOU ME GET
3 //N/O// V O // S V 
1
2 INFORMATION GOOD // IN CAR/GO HOME // ME WRITE / TYPE / FAX // LATER FAX-BACK
3 O // V O / V O // S V / V / V // V
1 __mcs
2 AT-LAST // ME MEET / DISCUSS / [WANT [SET-UP ix3 DEAF CLUB GOOD f-o-r PEOPLE++
3 // S V / V / V [O] V O
1 __mcs _____nmf
2 SATURDAY] // AT-LAST APPROVE / BRILLIANT GOOD // TIME-PASS ME LET-ALL-KNOW /
3 // V / N/O // S N /
1 \mp@code { n o d }
2 SEND DEAF / PUBLICISE / AS-WELL FOOTBALL TRAINING ME EXPLAIN / ix3++ / AT
3 V O / V / O O S O V / S N /
1 __cd+q
2 WHERE // [ME TELL [MEET]// PEOPLE COME / CROWD 44 PEOPLE COME // GOOD SEEM
3 N/O // S V [O]V // S V / V V // V
1
2 GOOD / ME NOT THERE / HOSPITAL LIE // [ME TELL PERSON [ix2 PRESENT] // EXPLAIN
3 O / N/O / O V // S V O [O]S V // V
```



```
1
2 YEAR/MEAN g-a-l-a FOOTBALL THEIR DISCO CHILDREN ix3 CHRISTMAS GALA ALSO/
3 / N/O
1
2 NEXT VALENTINE // THINK MAYBE LADY GROUP FOOTBALL ix3 GROUP / WILL ORGANISE
3 N/O // V O / V
1
2 DISCO // GOOD // WELCOME / [TRY [ENCOURAGE]/[TRY [DEVELOP] // ALSO t-r-i-p COACH
3 O // N/O // v / v [O] v / v [O] V // O
1 for-mp
2 BEFORE GO BLACKPOOL NEWCASTLE SHOPPING CENTRE // SEEM GOOD // ANIMAL
3 V // N/O //
1
2g-a-l-w-a-y WILD-LIFE REALLY BEAUTIFUL// 1 PERSON SIGN/MEAN WORTH
3 N/O // S V / N/O-
1 ___ca ___ca
2 COMMUNICATION SPEAKER / ALL WATCH // SPEAK / MOVE++ / WALK // DIFFERENT ANIMAL
3 -N/O / S V // v / V / V // O
1
l DIFFERENT++ ix3++ EXPLAIN // PERSON POINT++ / REALLY FANTASTIC // ALL RELAX TEA
1
2 COFFEE / GIVE FOOD PERFECT // GOOD LOVELY SUN / BIT CLOUDY // [COME [EXPECT
3 / V O // N/O / N/O // V [O] V
1
2 FINISH]/RAIN LITTLE-BIT // SO-ON GOOD INTERESTING // WHEN IN COACH / [HAPPEN++
3 / V O // N/O // V O / V
1 nmf __ca
2 [TALK INTERESTING]/[ALL LOOK [TIRE SLEEPY]// DRIVE / ARRIVE a-t m-WELL // BEEN
3 V / S V [O]V // V / v O //
1
2 RECENTLY LAST YEAR ix3 SOUTH C p-a-r-k BARBEQUE b-b-q BARBEQUE ix3 SAME
3
                                    N/O-
1
2 TIME JUMP-CASTLE DIFFERENT STALL++ // BOUNCE SWING BARBEQUE BURGER DRINK/
-N/O
                                    // N/O

```

1 __neg want-mp
2 CONTINUE] // GOOD ix3 IMPROVE // WANT DOWN-UP++ / UP++ // [SINCE 2003
3 V // S V // V O / V P //
1
2 TO-NOW 2008 SEEM [5 YEAR REALLY ME THINK BAD]/NO REALLY BRILLIANT/SEEM
3 V [O] S V O / N/O /
1
2 WELL PROGRESS IN NS:? DEAF CLUB // EVERY-WEEK SATURDAY GO++ //
3 N/O // O V //

```

\section*{A3.32 G14n}






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[^0]:    ${ }^{1}$ Lidell (2003: 62) notes that the object of such transitive verbs may be indicated by a topic instead or may already be prominent in the discourse.

