Auslan Corpus Annotation Guidelines

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Note: Interlinear written examples (based on informal observation and memory) are slowly being re-placed with example screen grabs from the corpus. (In order to save space, these grabs are relatively small. You will need to enlarge this pdf by up to 200% in order to read the annotations.)

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Preamble

The creation of signed language (henceforth SL) corpora—as modern linguistic corpora—presents special challenges to linguists. SLs are face-to-face visual-gestural languages that have no widely accepted written forms or standardized specialist notation system that can be used to represent what is being uttered. Until recently, transcription and glossing practices have created datasets that have been small, non-representative or not machine-readable in any meaningful sense. This naturally raises questions about grammatical descriptions or theoretical claims based on these data.

Detailed phonetic or phonological transcription has consumed the efforts of many research teams over a considerable period of time yet have resulted in relatively modest texts that still lack the identification of type-like units at any other level of linguistic organisation beyond the individual sign. Similarly, SL texts that are represented by contextually sensitive glosses, rather than phonetic or phonemic notation and transcription, have also proved problematic due to idiosyncratic practice (e.g., the same sign form actually being glossed in different ways in different usage contexts) and the fact that glossing itself usually gives little or no indication of sign form.

In these guidelines, I describe the way in which multimedia annotation software is being used to transform an archive of Auslan recordings into a true machine-readable linguistic corpus. I describe the structure of the annotation files in the Auslan Corpus and the glossing and annotation conventions used to create them. Details of the methodology used in the collection of the Auslan Corpus can be found elsewhere (Johnston & Schembri 2006, 2007b; Johnston 2008a, 2008c, 2008b). Detailed argumentation for prioritizing annotation over transcription in the creation of the Auslan Corpus can also be found elsewhere (Johnston 2010b, 2010a).

Corpus-based SL research

The need for a corpus-based SL linguistics arises from two major sets of concerns. The first applies equally to spoken language (henceforth SpL) and relates to 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. I will not repeat them here (see, e.g., Penke & Rosenbach 2004; McEnery, Xiao, & Tono 2006). The second set concern the nature and the impact of the acquisition and usage environments typical of SL users brought about by the shallow historical depth of signing communities, the absence of written forms, few institutional or 'schooled' language norms, interrupted intergenerational transmission, few native signers, language contact, and limited access to primary data for peer review. For detailed discussion of these factors in relation to SL transcription, annotation and corpora (see Johnston 1991, 2010a, 2012). Some of these are typical, if not unique, to SL-

using communities (e.g. intergenerational transmission, access to primary data) but the others may also characterise other language communities. Trudgill (2011), for example, has raised the issue of the impact of the social characteristics of speech communities on language structure in terms of the social determinants of linguistic complexity, variation and rates of language change (Schembri, Cormier, Fenlon, & Johnston 2013).

The abovementioned factors undoubtedly contribute to the fact that SL use is commonly reported to be highly variable (Schembri & Johnston 2013) and, apart from items of core basic vocabulary and cases of clear violations of logical or spatio-temporal coherence, it is often difficult to get consensus even from native signers with respect to what is phonologically, lexically or grammatically acceptable, typical or marked. The previous reliance on the intuitions of small numbers of informants in SL research is thus problematic. Together, these concerns make testing generalizations against attested usage particularly relevant in the field of SL linguistics.

A final consideration is theoretical. I am sympathetic to a broadly construction-based cognitive-functional approach to language structure, i.e., a framework that characterises language as a system of form-meaning symbolic units (constructions) of various sizes across the lexicon and grammar seen as a continuum (a lexico-grammar). Furthermore, I am sympathetic to usage-based theory and the notion that these constructions are an emergent property of language that are created and fed by repeated usage events. Usage-based theory demands that researchers attend to language-in-use (Bybee & Hopper 2001; Bybee 2010) hence the need for naturalistic data-sets.

It is relevant in this context to note that it has been taken as axiomatic by many SL researchers that almost all of the symbolic communicative behaviour of signing deaf people is language-dedicated. However, this is actually a working assumption, not an established fact. If gesture plays a significant role in face-to-face communication (spoken or signed) then some symbolic behaviour may not be linguistic in the sense of being part of a highly conventional, systematic, ordered, rule-governed system in which most of the forms—in either primary modality—are actually language-specific. Possibilities in wording and morpho-syntactic coding are often highly constrained by the very nature of linguistic systems, i.e., some constructional schemas are obligatory in certain contexts and thus many aspects of linguistic symbolic behaviour can be sampled from relatively small numbers of users precisely because of this. However, if the substantive symbols are not actually linguistic in the sense we have described then it is unlikely that any single individual, or small sample of individuals, will provide data upon which can be generalized core constructional schemas of the language. There is reason to believe that some aspects of signing behaviour (like mouth actions) fall into this category. Thus it is incumbent on researchers to accommodate this possibility, rather than generalize in an a priori fashion.

A central aim of SL corpus linguistics, therefore, is to empirically ground SL description in usage in order to validate previous research and generate new observations. Other aims are to document the linguistic community to aid in language maintenance in situations

of endangerment and for the preservation of a cultural artefact for its own sake; and, much more immediately, to create teaching and learning materials for SL-using communities because it is often difficult for learners to get adequate exposure to the language.

What does doing SL corpus linguistics entail? In the first instance, it entails creating documentary language recordings of well-described (i.e., with comprehensive and accurate metadata) naturalistic and representative texts produced by native signers. Secondly, it involves transforming and adding value to these recordings by making them machine-readable and by ensuring the resulting corpora are accessible for meaningful peer review.

Value-adding is achieved thorough notation, transcription, annotation and tagging. The distinction between each of these has been explained in depth elsewhere (Johnston 1991, 2010). In the context of these guidelines, it is sufficient to note that annotation is the appending of various labels to segments of a text (transcribed or not) for a multitude of reasons. In linguistic research, the labels relate to categories or concepts relevant to language analysis. Multi-media annotation software makes it is possible to gain instant and unambiguous access to the actual form of the signs being annotated—the raw data of the video recording—because annotations and media are time aligned. Provided there are spoken or written documentary recordings of a language which are available and accessible to the researcher, this eliminates the necessity for linguists to transcribe language data *first* before they are able to share data or commence a range of investigations into the lexicon and grammar.

Creating a SL corpus from a digital documentary archive

Though the annotation conventions describe here are not meant to be treated as proposals for standards that should necessarily be adopted in all SL corpora, there is, however, one convention that I believe *should* be adopted in every SL corpus in order for it to be properly constituted and machine-readable: sign types should be uniquely and consistently identified. I refer to the unique gloss-based annotations used in the Auslan Corpus as *ID-glosses*.

In addition, annotating should be seen as open-ended in two senses: first, it is never completed in the sense of being immune from correction; second, it is never completed in the sense that differing perspectives (theoretical or practical) can always be taken on the same piece of text, allowing for it to be annotated in another way. In short, we expect the annotations in the Auslan Corpus to be revised and augmented over time.

At minimum, annotations are reviewed by a second annotator and corrected or improved in some way. Similarly, existing annotations can be expanded and enriched by various researchers through subsequent different annotation passes of the video. In an enriching annotation pass the annotator either identifies individual signs or multi-sign constructions (phrases or clauses), prosodic elements or other intentional communicative behaviour that have previously been overlooked, or they attach a new linguistic annotation or tag to units already identified in an earlier annotation pass. Repeated annotation passes make each annotation file—and the whole corpus—a rich source of data for research.

In the revision of annotations, if an error is identified a time aligned comment annotation is added on the general *comments* tier. The comment is preceded with the word *error* to facilitate locating all possible errors quickly before deciding if a correction is warranted, e.g., by comparison with a lexical database, or in discussions with the corpus manager, the original annotator, the research team, groups of signers, etc., as money, time, human resources and research project time-lines and guidelines allow. This avoids the risk of changes having unforeseen knock-on effects with annotations on other tiers leading to inexplicable inconsistencies which corrupt the integrity of the data. It also saves time in that it avoids a situation in which one annotator or researcher may 'fix' something that another annotator, who does not think it is an error, may then later undo, and so on and so forth, in an unproductive cycle.

Finally, annotations are never really formally seen as final and "validated" by any person or entity, such as a committee of language experts, be they native users, teachers, or linguists. Nonetheless, it is imperative fluent, preferably native signers, be involved in all stages of corpus annotation. In any event, experience tells us that over time the annotations files tend to stabilize over time: fewer and fewer corrections are proffered because the annotations eventually reflect a broad consensus.

1   The Auslan Corpus and the Auslan Archive

The Auslan Corpus is based on a digital video archive of a representative sample of the SL of the Australian deaf community collected from 256 participants. The archive consists of two datasets.

One consists of data collected as part of a project investigating sociolinguistic variation in Auslan conducted by Trevor Johnston and Adam Schembri (2003-2005)[1] The second, the major part, consists of data collected through the Endangered Language Documentation Project funded by the Hans Rausing Endangered Languages Documentation Programme (ELDP) at the School of Oriental and African Studies (SOAS), University of London.[2] This archive was created during 2004-06 and deposited in the Endangered Languages Archive (ELAR) in 2008. The majority of the video clips (and some of the annotation files) have been accessible since 2012 from the ELAR. Both datasets together represent about 200 hours of sign language production by deaf native or near-native users of Auslan.

The Auslan deposit at ELAR (the *Auslan Archive*) is being slowly transformed over time into a true corpus, as described here. The Auslan Corpus consists of these video data and appended annotation and metadata files (Johnston & Schembri 2006). As of August 2019, 478 of the approximately 1,100 video clips in the Auslan Archive had received primary processing, i.e., basic annotation by way of ID-glossing with free translations. This represent about 14 hours of the 200 available hours and more than 105,000 glossed sign tokens.

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[1] Australian Research Council (ARC) research grant #LP0346973 Sociolinguistic Variation in Auslan: Theoretical and applied dimensions.
[2] Grant #MDP0088.

Some of the Auslan Corpus files with basic annotations are accessible on application by registered users to the ELDP Auslan Archive. Registered researchers may be able to access these editable corpus annotations for their own research or for proposed collaborative research with the depositor, Trevor Johnston. Researchers are usually asked to agree to share with the Archive any annotation files to which they have added new annotations. The new annotations may be specific to their study or they may extend or enrich the existing and original basic annotations.

A subset of the corpus files have received some degree of secondary and tertiary processing (see 1.1.4 below).[3] Of these, 50 clips as part of a research project investigating the grammatical use of space in Auslan,[4] another 50 as part of a research project investigating the grammaticalization of FINISH-related signs in Auslan (in which the mouth actions associated with all FINISH-related signs was annotated),[5] and another 100 in which clause level units, i.e., clause-like units, have been delimited with constituent arguments identified, where applicable (originally as part of the grammaticalization project and now being extended as part of a comprehensive study of the syntactic integration of pointing signs in Auslan).[6] This represents about 10,500 clauses in total (about 4,000 of which the full range of annotations attempted to date).

1.1 The annotation files

The Auslan Corpus is being annotated using digital video annotation software called ELAN (Crasborn & Sloetjes 2008)[7]. The software allows for the precise time-alignment of annotations with the corresponding video sources on multiple user-specifiable tiers.
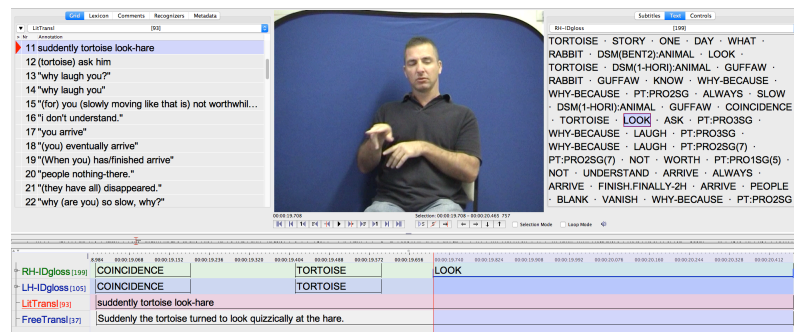
Figure 1 An open ELAN window showing media viewer with glossing and translation tiers (the time frame selected, shadowed in blue, is the duration of the sign LOOK).

ELAN allows one to create, edit, visualise and search annotations for video data. It supports display of video with its annotation; time linking of annotations to media streams; linking of annotation to other annotations; unlimited number of annotation tiers defined by users; different character sets; export of annotations as tab-delimited text files and a complementary ability to import text file annotations and controlled vocabularies (henceforth CVs). Relevant metadata for the digital recordings is appended to media files.

1.1.1   File naming conventions

Corpus files need to be named in a systematic fashion so that the original digital video tapes from which the clip has been sourced can be easily identified if ever data needs to be re-edited or re-digitized (Table 1).

Table 1 Filename structure

Example STJ_A1_c3_LH.eaf						
City	Initials (scrambled)	Partner code	Tape #	Activity code	Handed-ness	File type
S = Sydney	TJ = Trevor Johnston (scrambled in filename when publicly accessible)	A = signer on the left (B = signer on the right)	1 = "tape # 1"	c3 = "clip activity number 3"	LH = left handed	.eaf = ELAN annotation file

Signers are assumed to be right hand dominant and suffixes are appended to the file name only if they are not: LH for left handed and AMBI for ambidextrous (there is only one case of the latter). Recording sessions in the collection of the Auslan Corpus were composed of dyads. The person on the left was assigned the code A, and the person on the right the code B. The recording sessions lasted 3 hours and require 3 one-hour digital video tapes. The tapes are numbered #1, #2 or #3. The activities themselves (interview, conversation, retell, etc.) were numbered c1 (c = "clip") through to c9.

File names are exactly the same across related file types, e.g., media files (.mov, .wmv, .dv, .mp4, etc.), annotation files (.eaf), or metadata files (.imdi). (The imdi metadata function has not yet be used for the Auslan deposit. Metadata is kept in a separate spreadsheet.) In the working copy of the corpus (and not the publicly accessible copy) the data file names also include some appended metadata codes for gender (_M, or _F), age (_#) and nativeness (_NN for "near native" and _N for "native"). For the example above this would appear thus: STJ_A1_c3_M_60_N_LH.eaf. This means in many operations of searching and data export in ELAN, the results can be easily processed with reference to sociolinguistic variables without further time-consuming coding.

1.1.2   The tiers

The annotation files are created in ELAN using a template file that specifies the type of tiers that are available regardless of whether or not they are used in any particular annotation file. Additional study-specific tiers can be added at any time to an annotation file, but it is

advisable to have a template that can meet the needs of many researchers so that the same annotation file may be easily and repeatedly used for different purposes. The Auslan Corpus template uses the tiers shown in Table 1.

Table 2 Main tiers used in the Auslan Corpus

Parent tier ↳ Child tier	Expanded name	Linguistic type
RH ID-gloss	**Gloss**	**BasicAnnotation**
↳ RH-Mean	Meaning	BasicTag
↳ RH-GramCls	Grammatical class	GramCls
↳ RH-Transcrip	Transcription	BasicTag
↳ RH-Handsh	Handshape	BasicTag
↳ RH-Orient	Orientation	BasicTag
↳ RH-Loc	Location	BasicTag
↳ RH-Move	Movement	BasicTag
↳ RH-NonMan	Other non-manuals	BasicTag
↳ RH-OtherPhon	Other phonetic/phonological	BasicTag
↳ RH-ModOrVar	Citation modification or variation	ModOrVar
↳ RH-Freq	Lexical frequency	BasicTag
↳ RH-CAco	Co-occurrence of sign with CA	BasicTag
LH ID-gloss	**Gloss**	**BasicAnnotation**
↳ LH-Mean	Meaning	BasicTag
↳ LH-GramCls	Grammatical class	GramCls
↳ LH-Transcrip	Transcription	BasicTag
↳ LH-Handsh	Handshape	BasicTag
↳ LH-Orient	Orientation	BasicTag
↳ LH-Loc	Location	BasicTag
↳ LH-Move	Movement	BasicTag
↳ LH-NonMan	Other non-manuals	BasicTag
↳ LH-OtherPhon	Other phonetic/phonological	BasicTag
↳ LH-ModOrVar	Citation modification or variation	ModOrVar
↳ LH-Freq	Lexical frequency	BasicTag
↳ LH-CAco	Co-occurrence of sign with CA	BasicTag
ClauseLikeUnit(CLU)	**Clause-like unit ('utterance/meaning unit')**	**BasicAnnotation**
↳ RH-Arg	Argument identification	ClauseArguments
↳ RH-MacroR	Macro-role of argument	MacroRoles
↳ RH-SemR	Semantic role of argument	SemanticRoles
↳ RH-overtSUBJ?	Overt subject?	overtSUBJ?
↳ LH-Arg	Argument identification	Arguments
↳ LH-MacroR	Macro-role of argument	MacroRoles
↳ LH-SemR	Semantic role of argument	SemanticRoles
↳ LH-overtSUBJ?	Overt subject?	overtSUBJ?
CLUcomplex	CLUs overtly related to each other	BasicAnnotation
↳ OvertDependencyType	Nature of expression of dependency	BasicTag
CLUwithinCLU	Complement and embedded CLUs	BasicAnnotation
↳ OvertEmbeddedType	Nature of expression of embeddedness	BasicTag
CLUcomposite	Sentence complexity	BasicAnnotation
CLUmood	Mood	BasicAnnotation
CLUaktionsart	Event type or Aktionsart	BasicAnnotation
CLUtransitivity	Transitivity type	BasicAnnotation
LitTransl	Literal translation	BasicAnnotation
Non-manual & other		
CA	Constructed action or constructed dialogue	BasicAnnotation
↳ CA-Arg	Argument identification	ClauseArguments
↳ CA-MacroR	Macro-role of argument	MacroRoles
↳ CA-SemR	Semantic role of argument	SemanticRoles
↳ CA-overtSUBJ?	Overt subject?	overtSUBJ?
Body	Body	BasicAnnotation
Face	Global description of facial expression	BasicAnnotation
Head	Head movements	BasicAnnotation
Gaze	Direction of eye-gaze	BasicAnnotation
Eye&Brow	Eye and brow movements	BasicAnnotation
Mouthing	Mouthing (of words)	BasicAnnotation
↳ MouthingGCl	Grammatical class of mouthed English word	GramCls
MouthGestF	Mouth gestures form	BasicAnnotation
↳ MouthGestM	Mouth gestures meaning	BasicTag
FreeTransl	**Free translation**	**BasicAnnotation**
Comments	**Comments**	**BasicAnnotation**

Most tiers have yet to have any annotations entered in them for the vast majority of video files. The absolute minimum number of tiers in an annotated file in the corpus should be three: one ID-gloss tier for each of the hands, and one for free translations. (However, due to time constraints many annotation files in the Auslan Corpus have yet to be given a translation even though they have already been glossed.)

The Auslan Archive deposit in the ELAR at SOAS only has annotation files that have either two glossing tiers (RH-IDgloss & LH-IDgloss), three tiers (the glossing tiers and free translation), or four tiers (the glossing and free translation tiers, and the literal translation tier). There are no other annotations in the deposit.

1.1.3   The linguistic types

For parent tiers that do not have an associated stereotype and do not use a CV we assign the linguistic type called *BasicAnnotation*. If a parent tier uses a CV we assign it to a linguistic type which is named after that CV.

Child or dependent tiers tag an annotation on a parent tier for phenomena we hypothesise are part of linguistic coding in the language or which are otherwise relevant in the analysis of the lexicon and grammar of the language. When a child tier has no associated CV we define it as the linguistic type BasicTag with the stereotype *Symbolic Association*. When a child tier has an associated CV we name after its CV. These tiers also have the stereotype Symbolic Association, except the RH-Arg ('right hand argument') and LH-Arg ('left hand argument') daughter tiers of the clause level tier which have the linguistic type ClauseArguments which has the stereotype *Included in* (Table 3). The clause level tier is referred to in these guidelines as the 'CLU tier' which stands for "clause-like unit" (explained further below at 2.2.2.1).

Table 3 Current linguistic types in the Auslan Corpus

Type Name	Stereotype	Use Controlled Vo...	DC ID	Time-align...	References...
BasicAnnotation	–	–	–	✓	~
BasicTag	Symbolic Associat...	–	–	~	~
GramCls	Symbolic Associat...	GramCls	–	~	~
ModOrVar	Symbolic Associat...	ModOrVar	–	~	~
MacroRoles	Symbolic Associat...	MacroRoles	–	~	~
SemRoles	Symbolic Associat...	SemanticRoles	–	~	~
ClauseArguments	Included In	ClauseArguments	–	✓	~
Gaze	–	–	–	✓	~
Eye-brow	–	–	–	✓	~
Body	–	–	–	✓	~
overtSUBJ?	Symbolic Associat...	overtSUBJ?	–	~	~
Frequency	Symbolic Associat...	–	–	~	~
CA-co	Symbolic Associat...	–	–	~	~
Face	–	–	–	✓	~
HypotacticType	Symbolic Associat...	HypotacticType	–	~	~

1.1.4   The three phases of annotation

The transformation of archived media into a linguistic corpus effectively occurs in three phases of primary, secondary and tertiary processing that are described in these guidelines.

1.1.4.1   Primary processing

Primary processing occurs in two phases or at two levels: basic annotation or detailed annotation.

Basic annotation The basic level of corpus annotation involves *segmenting* the Auslan text into sense units that a free translation into written English aligns comfortably with, and *segmenting* and *tokenising* the Auslan text into individual signed units and then *glossing* these units.

Detailed annotation The detailed level of corpus annotation involves annotating other levels of linguistic and communicative activity, including those involving non-manual activity. As can be seen from Table 2, there are dedicated tiers for all of these aspects of non-manual behaviour. All these non-manual behaviours need to be able to be annotated in order to assist in the determination of their role in the lexico-grammar of any SL.

1.1.4.2   Secondary processing

Secondary processing entails the addition of further information ('tags') to the annotations already created in primary processing (sign tokens or CLU tokens). They involve the sub-categorization of constructions of various sizes (from individual signs to phrases, clauses, and complex sentences) and the identification of their constituents. Secondary processing thus adds phonological, morphological, semantic, syntactic, pragmatic and discourse information about linguistic forms, depending on the purpose of the analysis. Some tiers use CVs.

1.1.4.3   Tertiary processing

The opportunities opened up by annotating digital video SL corpora in the ways outlined above mean that it is possible to manipulate through searching and sorting the primary and secondary annotations to extract information, such as frequency characteristics or co-occurrence patterns. This information can then, in turn, be added to the corpus, e.g., by way of additional tags to existing ID-glosses or CLU annotations, to enrich it further and make possible further more sophisticated analyses taking these values into account.

2   Primary processing

Primary processing occurs in two phases or at two levels: basic annotation or detailed annotation. The basic level of corpus annotation involves segmenting the Auslan text into sense units that a free translation into written English aligns comfortably with, and segmenting and tokenising the Auslan text into individual signed units and then glossing these units. The detailed level of corpus annotation involves annotating other levels of linguistic and communicative activity, including those involving non-manual activity.

2.1   Basic annotation

The preferred minimum number of tiers in an annotated file in the corpus is three: one for the free translation and two ID-gloss tiers. All new annotated files are created this way. However, in the early years of annotation (2004-2008) only ID-glossing was added in an attempt to create as much glossed text as possible in the shortest amount of time. Those gloss-only annotation files are being enriched with translations whenever time and resources become available. Our experience with the Auslan Corpus has taught us that it is preferable to do free translations during the initial primary annotation parse of the data, not later.

2.1.1   The free translation tier

A written free translation is provided as the very first step in creating a basic annotation file for a video. The free translation is placed in annotation fields that are time aligned with 'chunks' of the signed text that appear to form a coherent unit based on meaning or delivery. With respect to meaning, one chooses a stretch of signing that comfortably aligns with what one might potentially say, or write, in an English sentence. With respect to delivery, the translation unit is likely to be bounded or delineated by pauses, head nods, or changes in visual-gestural intonation and rhythm. However, experience tells us that a typical English translation unit is likely to span several Auslan clauses. *In other words, these English-like translation sentences are not attempts to segment the Auslan text into its potential language-specific syntactic or grammatical units. That is done with the annotation of ClauseLikeUnits (2.2.2.1).*

A written translation is preferred to dubbing in spoken English as it provides an immediately and easily searchable text. This is a practice that has also been adopted in other corpora, see (Crasborn, Zwitserlood, & Ros 2008; Cormier, Fenlon, Rentelis, & Schembri 2011). The creation of a translation is also meant to create a type of Rosetta Stone-like parallel text: even if no other processing of the SL documentation should occur in the short term, it may still be possible to use the translation to investigate the SL at some other time when funds, expertise or time becomes available.

2.1.2 The glossing tiers

Next the video recording is segmented, tokenized and glossed. Two tiers, one for each hand, are used to gloss signs. For a right-handed signer, if the left hand is involved in articulating a normally two-handed sign then that hand is also glossed (it has the same gloss as the right hand). Naturally, a one-handed sign is only annotated on the hand that articulates it. The independence of each tier can then be exploited to show if two different signs are being articulated at the same time or if the articulation of one hand spreads over the time interval of more than one sign of the other hand when this appears to be meaningful.

A note on hand dominance and handedness All multi-media recordings of face-to-face language need to deal with issues of simultaneity (intonation, gesture, conversational overlap etc.). Though this issue is not unique to SLs the fact that signers use two hands means the issue is particularly important. After all, one hand can intentionally articulate a sign when there is nothing articulated on the other hand, or simultaneously with a second sign on the other hand. Therefore, provision must be made to annotate each hand independently when required. The two hands may be identified simply as the left and right hand or labelled the dominant (or strong) and the subordinate (or weak) hand respectively according to the handedness of the signer. The Auslan Corpus adopts left and right hand labels while the Swedish SL corpus labels each as the strong or weak hand, following the handedness of the signer. We prefer simply to annotate the activity of the left and right hands of the signer (naturally inverting from the video image—we do not mean 'the left hand in the video' but 'the left hand of the signer') because doing this means that annotators only need to make one type of reversal regardless of the actual left or right handedness of the signer (rather than constantly thinking 'is the signer right-handed or left-handed, so should I put the annotation on the strong or weak hand tier'). As described below, there are simple procedures within ELAN for aggregating all the annotations according to the hand dominance of the signer even if one has adopted the literal left and right hand labels

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It is imperative that signed units of the same type are consistently and uniquely identified: each token of a type should have the same identifying gloss which is unique to that type. A gloss which uniquely identifies a lexical sign is called an *ID-gloss* (Johnston 2001, 2008d, 2010b).
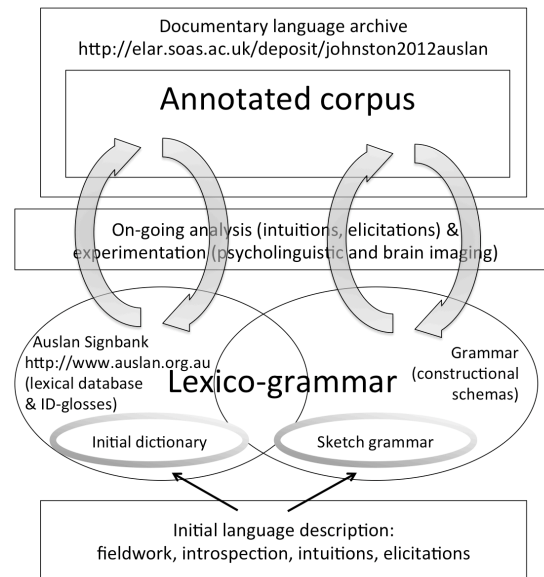
Figure 2 The relationship of ID-glossing using a lexical database to corpus-based SL research

In order to do this effectively and efficiently, one needs a reference lexical database that documents the lexical items (lexical types) of the language. The Auslan Corpus annotators use the Auslan lexical database which is publicly viewable as the Auslan Signbank website (www.auslan.org.au). Of course, no dictionary (or grammar) is ever complete so if novel sign tokens are encountered in the corpus which are believed to be unrecorded conventional lexical units of the language, they are added to Auslan Signbank. The process is necessarily circular (Figure 3).

In the ideal corpus-building situation, it is not expected that one would begin to gloss a SL text[8] without first having conducted basic lexicographical and lexicological research into the language and recording and describing the resulting (tentative) lexicon in a database or dictionary.[9]

As we have seen, identifying sign types involves relating tokens to the lexicon. However, not all signs encountered in a SL text are conventional signs that should be listed in a dictionary. Signs vary in degrees of conventional specification and range from the fully-lexical, through partly-lexical to non-lexical signs. See (Johnston 2010b; Johnston & Schembri 2010; Johnston 2013) for a detailed description of sign types.

Briefly*, fully-lexical* signs are highly conventionalised signs 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.

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[8] By text we mean any planned or unplanned coherent stretch of language (in this case, therefore, a video recording) and not something which is necessarily written or transcribed.

[9] In circumstances of critical language endangerment, there may be no time to do this before there are no speakers/signers remaining. One would then have to rely on the parallel translation to begin the difficult process of tokenizing the text and identifying possible form-meaning pairs and attempt to construct a lexicon.

Partly-lexical signs are combinations of conventional and non-conventional (highly contextual) elements. In the SL linguistics literature, most signs described as depicting signs (also known as classifier or polymorphemic signs) and indexing signs (or pointing signs) belong to this category. They cannot be listed in a dictionary in any straightforward way, nor, consequently, can they be easily assigned an ID-gloss. Signs which are *partly-lexical* have one or both of these two important characteristics: (i) they have little or no conventionalised or language-specific meaning value *in addition to* that carried by their formational components (e.g. handshape, location, orientation etc.); (ii) they have a meaning that is incomplete in some way—one needs to refer to the context of utterance (the unfolding text and/or the actual utterance space) in a non-trivial way to 'complete' the meaning of the sign. They cannot be listed in a dictionary in any straightforward way, nor, consequently, can they be easily assigned an ID-gloss.

	Fully-lexical sign	**Partly-lexical sign**
Fully-lexical meaning	**As a Noun** 1. The choice you make at an election, or at a meeting where decisions are made. English = vote 2. An organized process in which people vote to choose a person or group of people to hold an official position or to represent them in government. English = election. **As a Verb** 1. To make your choice in an election or at a meeting, usually be writing on a piece of paper. English = vote. 2. To choose a person to hold an official position or to represent you in government by voting. English = elect.	n/a
Partly-lexical meaning	'put something small into a cylindrical container, or any thing or activity associated with this'	'eat/put-in-mouth something small from a cylindrical container, or any thing or activity associated with this'
Contextual meanings that complete partly-lexical meaning	*Only if context forces abandonment of default fully-lexical meaning and where context motivates and narrows interpretation to…* money-box, put coin in money-box sewing-kit, put something into sewing-kit pin-cushion, put pin into pin-cushion drill-bit, crane lowers drill-bit into wellhead and so on...	*Only where context motivates and narrows interpretation to…* popcorn, eat popcorn nuts, eat nuts nibbles, nibble finger food, eat finger food pin-in-mouth, take pin from pin-cushion and place in between your lips and so on…
Corpus gloss	VOTE	DSH(F):describe-as-appropriate

Figure 3 A comparison of a fully-lexical and partly-lexical sign in Auslan

Non-lexical signs are essentially gestures that appear to have no *language-specific* conventionalized form/meaning pairing of their own (Figure 4). In this context, we mean by gesture

any intentional communicative bodily act (both manual and non-manual) with little or minimal conventionalization of meaning and form (cf. Kendon, 2004).
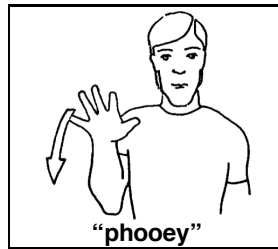
Figure 4 A dismissive gesture

Gestures rely on context to be construed as signs and to be correctly interpreted, e.g. that the signed act illustrated above is actually a dismissive gesture, rather than, say, an attempt to disperse some cigarette smoke. Gestures can fulfil a range of functions in SLs and SpLs: they may act as or substitute for a verb or a noun, they may augment or modify the meaning of nouns and verbs, they may modulate and express the mood or attitude of the speaker, and they may regulate the discourse and interaction. If a mimetic enactment or iconic depiction found in a SL text is similar to the type of production typical of hearing non-signers in the same culture in a similar communicative situation, it is assumed the act is gestural. Of course, the highly conventionalized gestures found in speech communities are not gestures in this sense, they are signs or, more precisely, emblems (Kendon 2004). Within the embedded SL-using community these emblems are indistinguishable from other conventional lexical signs (Johnston 2013).

The glossing conventions are different for each of these different types of signs in order to make them easily identifiable and thus easy to include or exclude in any corpus-wide searches and sorts.

2.1.2.1   Fully-lexical signs (conventional symbolic units)

Lexical signs are easily identified using an ID-gloss written in upper case or small caps, e.g.

(1)

The ID-gloss is retrieved from *Signbank* or assigned if no entry exists. To retrieve the ID-gloss the annotator searches the database using one of the English keywords (i.e., translation equivalents) associated with the sign. (The ID-gloss of a sign is usually one of the keywords associated with the sign.) If a sign needs more than one distinct English word to gloss it, hyphens are placed between the words (spaces are not used), e.g.,

(2)

An attempt is made to make each ID-gloss a distinct and unique English word (or words). However, at times, some common high frequency English words may need to be used more than once to gloss equally common or high frequency Auslan signs because the association of a particular English word with more than one Auslan sign form is so strong for Auslan signers it may demand the word be 'reused', i.e., they both have the same standard mouthing. In these cases, a word (or less often a handshape letter code or a number) is appended to the gloss, after a period. The added word, handshape code or number hints at the form or meaning of the sign in question. This appended hint helps annotators remember the ID-gloss.[10] As a general rule, therefore, any word or symbol after a period in an ID-gloss should not be construed to be part of the "meaning" of the ID-gloss but rather some kind of hint to discriminate which of several possible signs is associated with the meaning gloss that comes *before* the period.

For example, there are at least two signs in Auslan that are best glossed as FINISH. One is made with the 'good' (or 6) handshape and one is made with the 'spread', 'five' or 5 handshape. They are glossed as follows:

(3) FINISH.GOOD

(4) FINISH.FIVE

A note on ID-glossing and glossing: ID-glosses are an essential tool in creating a machine-readable annotated linguistic corpus. When Auslan examples appear in print in a publication, however, ID-glosses need not be used, or at least not used alone. ID-glosses are likely to confuse a general audience because they might not closely reflect (literally "gloss") the meaning of the sign. That is not the purpose of an ID-gloss. A gloss which is the best translation equivalent for a given context is much more appropriate for this situation. One of the keywords associated with an ID-gloss is probably going to be the most suitable word to use in these cases. However, 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 may well be counter-productive.

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[10] In earlier versions of the annotation guidelines for ID-glossing, the primary glossing words were reused and sequence numbers were simply added to it, in order of their creation (e.g. BEFORE1, BEFORE2, BEFORE3). This system proved to be too opaque. Annotators found the numbers too difficult to remember. These types of ID-glosses are being progressively replaced in the corpus with hint word or symbol added after a period.

2.1.2.1.1 The meaning tier

There are two main uses for the meaning tier. First, it records the meaning of a sign when no ID-gloss appears to be available because the appears to be a new and unrecorded lexical sign. The annotator chooses the simplest English word to gloss that sign as appears to be appropriate given the context, appends their initials to that temporary gloss, and adds a few words of meaning explanation on the 'meaning' tier. In the following example, the ID-gloss CONTRITION has been assigned by an annotator (e.g., TJ, Trevor Johnston) to a sign and it means something like 'contrition', 'remorse', 'regret' or 'sorrow'.

(5) ID-gloss CONTRITION-TJ
     Meaning   contrition/remorse/regret/sorrow

If the newly identified sign is subsequently recognized as a new or unrecorded sign, an entry is created in the lexical database and an appropriate ID-gloss assigned to the sign form. The existing glosses in the corpus for this sign are then corrected through a universal search and replace.

Second, the tier records a meaning for a sign which has yet to be listed as a keyword for that sign in the lexical database, i.e., this is potentially a simple omission in the database, but it may also be a nonce usage of the sign. At least the tag allows for the annotator's 'act of interpretation' to be recorded at the token of the ID-gloss for future consideration. Over time, a larger corpus may help resolve the issue.

2.1.2.1.2 Variant forms

Since no word or sign is ever pronounced or produced absolutely in the same way at each utterance event, it should be self-evident that minor individual variations in sign form are ignored when glossing. However, individual variation of this kind has to be distinguished from the many changes or modifications in word or sign form that are deliberate and meaningful, conveying significance which may be considered to be grammatical (inflectional) or lexical (derivational) in some way.

Where modifications are grammatical or inflectional in character they are also ignored at the ID-glossing level: the ID-gloss of the basic citation form of the sign is given in the annotation that identifies the sign. Other information about the grammatical class of the sign, the type of modification, and its significance, are entered on other child annotation tiers, as a part of secondary tagging (see 2.2.2.2).

Where modifications are derivational in character they are associated with a new or separate conventional lexical sign form, which is thus listed in the lexical database and assigned its own ID-gloss.

Sometimes a sign form appears to be a minor variant of a more common or standard form, using a slightly different handshape, movement pattern or location and these variations may appear to be neither grammatical nor idiosyncratic. For a large number of signs in Auslan, the possible variant forms of this type have already been identified and recorded in the Auslan lexical database in one way or another. For example, the types of handshapes

that commonly substitute for others and the environments in which this is likely to occur has been described in the various dictionaries of Auslan (Johnston 1989, 1997, 2004). At this level these modifications are reasonably well understood and there is thus often nothing new to be learned in explicitly coding for this either in the ID-gloss or in secondary tagging in the corpus.[11]

Nonetheless, if the frequency and environment of variant forms *is the very focus of corpus analysis* then this can be, and should be, explicitly dealt with through secondary tagging on the transcription tier and its daughter tiers. Briefly, these tiers can be tagged with specific phonological features describing the actual form of a particular sign token. It goes without saying that even if form variation is not the focus of study, it may deserve to be explicitly annotated because the form may not actually be recorded in the Auslan lexical database, or it may appear to be particularly noteworthy for other reasons, e.g., the environment in which it is observed.[12]

A note on form. The priority in corpus annotation should be the creation of a reference machine-readable text. Of course, sign form is not unimportant. However, the best strategy for a multi-purpose corpus is to tokenize a text into its major symbolic units (signs) *first,* before *then* adding detailed time aligned information on sign form to the existing reference 'text' (basic annotation of the video) on other dependent or independent tiers.

2.1.2.1.3 One-handed and two-handed forms

The corpus does not label the right or left hands as 'dominant/strong' or 'subordinate/weak'. They are labelled literally as right hand (RH) and left hand (LH). The hand dominance of the signer (right handed or left handed) is recorded in the metadata for that individual *and* in the name of the actual annotation file (see above 1.1.1).

If the sign is two handed (e.g. OWL), the ID-gloss is written on two tiers (or lines), one for each hand.

(6)

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[11] Partly-lexical signs, on the other hand, regularly include a code for the instantiated or variant handshape, e.g. see the discussion of pointing signs and depicting signs below.

[12] In earlier annotation templates, the type of 'unexpected' variation was coded in the ID-gloss, e.g. SUGAR(K) signified SUGAR made with a K handshape, or HOUSE(W) signified HOUSE made with a W handshape. This type of annotation is only meant to be temporary. It is stripped from the ID-gloss when it has been analysed or accounted for, i.e., some record of this variability is made within Signbank. It is our intention to discontinue this practice, as handshape variation, for whatever reason, can be coded on the appropriate transcription tier.

If it is one handed, it is annotated on the hand the sign is on, even if it is the signer's non-dominant hand. Nothing appears during the time span on the non-active hand tier.

(7)

If a different sign occurs on each hand, a different annotation gloss is made on each hand, as appropriate.

(8)

In the current form of the Auslan Corpus, if a sign is entered in the dictionary and database as normally one-handed but is actually made with two hands, the annotation is suffixed with -2H after the gloss.

(9)
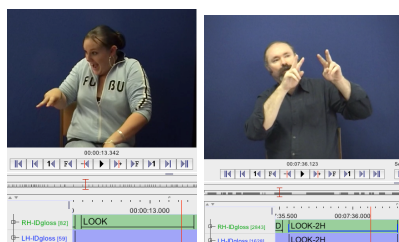
Conversely, if a sign is entered in the dictionary and database as normally two-handed but is actually made with one hand, *-1H* is suffixed after the gloss on the hand that is articulating the sign.

(10)
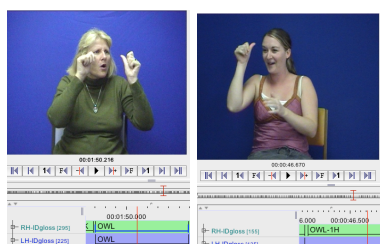
As with all information in the Auslan lexical database, the expansion and enrichment of the corpus will make it possible to confirm or disconfirm information recorded in the database. For example, many signs have one-handed and two-handed forms and it is often difficult to establish which is the most common or unmarked form (or the citation form). Thus, evidence of usage from the corpus that GLASSES is actually more frequently produced as a one-handed rather than a two-handed sign would lead to the database dictionary to be revised accordingly, and the annotations in the corpus similarly adjusted.[13]

A note on the use of an integrated lexical database with ELAN: improvements and extensions of ELAN are expected in the future. For example, using a lexical database linked to annotation files, one could use a multi-tier search query like "is the gloss on the dominant tier the same, different or empty as the annotation on the weak hand tier". Such an ability to search would make no longer necessary to note if a token of a type found in the lexical database was or was not like the citation form. One could also identify the environments in which it was not like its citation form in terms of the use of one or two hands.

If a form of a sign involves changes to both handshape and the number of hands used, handshape is coded first, followed by information about the number of hands, thus:

(11)

The ID-gloss PT:PRO1SG(B)-2H refers to the sign PT:PRO1SG ("I" or "me") produced with the B (flat) handshape (rather than the 1 or point handshape), using both hands (rather than just the one hand). This type of additional formational information is usually only attached to pointing signs or depicting signs (see below for further details).

Table 4 The use of hyphens, periods, parentheses, and numbers in ID-glosses

Form of gloss	Meaning
GLOSS	An English word used as a gloss for a sign
GLOSS-GLOSS	If more than one English word is needed to gloss a sign, and each word contributes to the sense, they are separated by hyphens.
GLOSS.HINT	If one cannot avoid using the same English word to gloss two or more signs a period is used to separate a second word after the common first gloss to distinguish them (i.e., the second word "hints" at which one of

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[13] In a working research copy of the corpus, this practice can be adapted and exceptions made to suit research questions. For example, research into variant forms for FINISH-related signs has coded each token of any FINISH sign as -1H or -2H regardless of what is listed as the citation form in the Auslan Lexical Database. These signs are being studied in detail and we wish to know the frequency and distribution of different variant forms of all tokens (one- vs two-handed, five vs six handshape, etc. etc.). It is thus useful to include this information in all ID-glosses. Universal search and replace functions in ELAN make this easy to implement (and undo when required).

Form of gloss	Meaning
	the two is intended, according to any critiera that easily helps the annotator). The second word is not part of the "sense" of the gloss.
GLOSS1, GLOSS2, ETC.	This type of numbered gloss has been discontinued and is being replaced. Originally, it was used in this situation: A gloss for a sign which uses an English word has also been used to gloss another. The GLOSS.HINT convention now replaces numbers.
GLOSS-2H	A gloss for a sign that normally one handed, but appears with two hands.
GLOSS-1H	A gloss for a sign that normally two handed, but appears with one hand.
GLOSS(..)	A gloss for a sign which is in a form which is not the expected or default one. The material in parentheses (..) describes the modification or variation by using either symbols (e.g., HamNoSys) or letters and abbreviations (e.g., B, H, BENT2, etc.).

2.1.2.1.4 Numbers, digits and number incorporation

If a signer uses a number to refer to anything (e.g. the year 1987) it is glossed using words, and not with digits.

(12) NINETEEN-EIGHTY-SEVEN   *not* 1987 or

(13) ONE-NINE-EIGHT-SEVEN   *not* 1987

If a number is incorporated into a sign (e.g. signs for clock times, years, weeks, days, age, etc.), it is also glossed using words, and not with digits. Usually, unit signs that incorporate numbers have a default sign that also means one unit of the measure. For example, the sign WEEK also means 'one-week' even tough it is simply glossed as week. When it incorporates another number, the number is appended in the parentheses after the sign.

(14) WEEK(TWO)   *not* TWO-WEEKS   or   2-WEEKS

(15) WEEK-AGO(TWO)   *not* TWO-WEEKS-AGO   or   2-WEEKS-AGO

(16) AGE-YEARS(FOURTEEN) *not* FOURTEEN-YEARS-OLD or   14-YEARS-OLD

(17) O'CLOCK(TWO)   *not* TWO-O'CLOCK   or   2-O'CLOCK

(18) YESTERYEAR(THREE)   *not* THREE-YEARS-AGO   or   3-YEARS-AGO

(19) YESTERDAY(FOUR)   *not* FOUR-DAYS-AGO   or   4-DAYS-AGO

The main reason for this is that when annotations are exported as tab or comma delimited text to be sorted, counted or otherwise treated in a database program, digits can confound some programs into processing records as number records rather than text records. Also, simple sorting of all glosses is not possible as numbers are treated differently to character symbols.

2.1.2.1.5 Negative incorporation

Many Auslan verbs that have a negative sense achieve this by the incorporation of a sign element that denotes negation. The ID-gloss for these signs is entered in the dictionary by a general meaning gloss followed by a gloss for the negation. This makes it easier to search and sort signs by meaning and name than if they were glossed as, say, DON'T-KNOW rather than KNOW-NOT, i.e., KNOW and KNOW-NOT will be next to each other if sorted alphabetically.

Any newly identified negative signs that appear to have a final negative component should be glossed using this pattern.

(20) KNOW-NOT *not*   DON'T-KNOW

(21) WANT-NOT *not*   DON'T-WANT

(22) WILL-NOT *not*   WON'T

2.1.2.1.6 Proper names

Proper names in Auslan (also known as *name signs* or *sign names*)[14] are prefixed with NS: followed by the proper name. Thus a name sign for a person called *Peter* would be written as follows:

(23) NS:PETER

Additional information may be added, but is not required. For example, if the sign name is based on fingerspelling the relevant letter(s) or a hint regarding sign form can be added after the gloss.

(24) NS:PETER(P-shake)

If the sign name is identical in form to a lexical sign, the relevant sign may be identified after the name in brackets.

(25) NS:MISSKENTWORTH(HAIR-BUN)

2.1.2.1.7 Signed English signs and foreign borrowings

Lexical signs which appear to be borrowed from a signed system (e.g. Australasian Signed English) or another SL and which are generally not considered to be a part of Auslan have an ID-gloss that includes this information appended after a period. Thus

(26) GAVE.SE

is the ID-gloss of the Signed English sign GAVE. If the sign appears to be a recent or idiosyncratic borrowing from another SL it will not be found in the lexical database of Auslan and will thus not have an assignable ID-gloss. One gives the best gloss possible in the context followed by the name of the SL from which it is borrowed. For example, the borrowed ASL sign COOL would be written:

(27) COOL.ASL

2.1.2.2 Partly-lexical signs (symbolic indexical signs)

The assignment of ID-glosses to *partly-lexical* signs is not at all straightforward. One cannot simply refer to a lexical database and extract the ID-gloss for some signs because there is no citation form. Instead of using standard identifying glosses to identify the token as a token

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[14] In earlier versions of the guidelines the prefix was SN. It has now been changed to NS simply because no English word begins with this letter combination. This makes sorting and counting ID-glosses quicker and more efficient.

of a type (i.e., a lexical sign). Tokens of partly-lexical signs are glossed using a combination of general and idiosyncratic elements because each token is essentially unique. Partly-lexical signs, such as pointing signs and depicting signs, can thus still be extracted from the corpus for analysis and comparison even though each token is, in a very real sense, a "singularity" (a token without a reference type) rather than a "regularity" (a token of a type). Searches for frequency and collocation can be conducted using sub-string matches, based on the component of the gloss which is the general identifier.

2.1.2.2.1 Pointing signs[15]

As can be seen from Table 5 most glosses for points begin with PT (for 'point'). This is followed by additional specification as to the type of pointing sign it is (see 3.1.2.2 for further explanation of grammatical class categories).

It is often difficult to make the more detailed further specifications of point type during a first pass of a text, so many pointing signs will initially only be identified as PT on the ID-gloss tier. Expanding the gloss further actually involves the type of analysis normally performed for tagging on the grammatical class tier because one is trying to determine its function or role. To this extent, it is thus also true that the more detailed specification added to the ID-gloss of pointing signs is somewhat redundant because it repeats the type of information found on the grammatical class tier. However, it is quite useful to have this information included in the PT gloss so that sorts and frequency counts of all ID-glosses, including PTs—as a single category of annotation—can be done in an individual run.

If the handshape used in the pointing sign is different to what is normally expected of a pointing sign in the context in which it appears, and the annotator wishes to include this information, it can be placed in parentheses at the end of the gloss. (See the appendix for a table of handshape codes.) For example:

(28) PT:PRO1SG(B)   = 'I/me' made with a flat handshape
(29) PT:POSS1SG(5)   = 'my' made with a five handshape

2.1.2.2.1.1 Notes and clarification about pointing signs

Location: every pointing sign appears to imply location is some way. Thus a pronominal pointing sign—one that primarily points to a referent/participant—is not automatically labelled as PT:LOC/PRO even though it may also imply location. Location is implied in such a large percentage of pronominal points that we have decided that the PT:LOC/PRO label is used only if it is actually impossible to decide what is the most salient intended meaning—an entity or a location. Consequently, PT:PRO means '*clearly primarily* points to a referent/participant' and *not* 'has *no* locative implication also'.

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[15] Alternatively called *index signs* by many SL researchers. Consequently, may researchers prefer to use IX in the glossing of various types of pointing signs. Any abbreviation is appropriate provided that it is applied systematically within a corpus.

Plurals: preliminary corpus data suggests that the plurality of a pointing sign is determined from context, and not obligatorily encoded in sign morphology, i.e., if that which is pointed at represents multiple entities, the point is not usually modified. These signs nonetheless include a PL component in their gloss so that corpus annotations can be used to test how often plural sweeps (arcing), repetitions (with or without re-location), handshape modifications or number incorporations do in fact indicate plurality.

Table 5 Different annotations for pointing (indexing) signs

Point type	Description of function
Major types	
PT:PRO(person,number)	Points to a referent, i.e., the pointing action appears to ***primarily*** intend to identify a participant, not the location of the participant. It is thus like a pronoun (e.g. 'he', 'they'). It is further specified as first (1), second (2), third (3) person; and singular (SG) and plural (PL).
PT:LOC(number)	Points to a location, i.e., the pointing action appears to ***primarily*** intend to identify a location, not a participant at a location. It is thus like a locative adverb or locative predicate (e.g. 'here', 'there'). It may be further specified as plural (PL) but is normally assumed to be singular.
PT:DET(number)	A point made immediately next to (or simultaneously with) another sign that names a referent. The referent appears to be known, assumed, or familiar, especially if it has already been mentioned in the text. It is like as a determiner. It may be further specified as plural (PL) but is normally assumed to be singular.
PT:LOC/PRO(person,number)	Points to a referent/location, i.e., the pointing action appears to mean both equally. It is thus like a pronoun *and* a locative and it appears impossible to prioritize or separate either of these two meanings (e.g. 'it-there'; 'it-here', etc.). It seems that both senses and functions need to be attributed to the pointing action for the utterance it occurs in to be accurately described, even if it would be unnecessary to give both types of meaning expression in an English translation. It may be further specified as plural (PL) but is normally assumed to be singular.
PT:DET/LOC(number)	A point made immediately next to (or simultaneously with) another sign that names a referent. The referent appears to be known, assumed, or familiar, especially if it has already been mentioned in the text. It is like a determiner but it has some underlying locative sense as well, i.e., the pointing action also points towards the general location of the previously identified referent if it was assigned a location in the signing space during previous mentions. Thus the pointing action appears to determine and locate equally, functioning as a determiner *and* locative and it appears impossible to prioritize or separate either of these two meanings (e.g. 'the-there'; 'the-here', etc.). It seems that both senses and functions need to be attributed to the pointing action for the utterance it occurs in to be accurately described, even if it would be unnecessary to give both types of meaning expression in an English translation. It may be further specified as plural (PL) but is normally assumed to be singular.
PT:DET/LOC/PRO(person,number)	A point made immediately next to (or simultaneously with) another sign that names a referent. It is like a determiner, yet it also contains locative information, as well as having some pronominal sense. The referent usually precedes the point and has a topic-like marking, but the NP PT:DET/LOC/PRO string is ***not*** a separate predication in itself because prosody shows it is clearly a constituent of the rest of the clause-like unit (CLU). For example, BOY PT:DET/LOC/PRO YELL WOLF ("boy the-there-he laugh"). The following translations in English could all be felicitous: *the boy laughed; the boy over there laughed; the boy over-there, he laughed*. The pointing action appears to determine, locate and pronominalized all at the same time, and it appears impossible to prioritize or separate any of these three meanings, i.e., in a very real sense it means 'the-there-it' or 'the-here-it', etc. It seems that all senses and functions need to be attributed to the pointing action for the utterance it occurs in to be accurately described, even if it would be unnecessary to give all types of meaning expression in an English translation. It may be further specified as plural (PL) but is normally assumed to be singular.

Point type	Description of function
PT:LOC(TEMP)	Points to a period in time which has been associated with a location in the signing space (or becomes so through the very act of pointing). It is thus like an adverb of time (e.g. 'yesterday', 'then', 'at that time').
PT:POSS(person,number)	A sign that points to the possessor or the thing possessed (points with palm of a fist handshape or a flat handshape). Further specified as first (1), second (2), third (3) person; and singular (SG) and plural (PL).[16]
PT:SELF.PRO(person,number)	A sign that points to someone or something with the palm of an IrishK or one-hand letter-D handshape as it flicks open. The referent either does some related action alone or by itself (without assistance) or does it to itself (the action is reflexive). Further specified as above for person and number.
PT:BODY(bodypart)	A sign that points to a body part which is not considered to be a lexical sign, e.g., pointing to one's right shoulder simply means "that which I am pointing at, which happens to be a body part" and is glossed PT:BODY(right-shoulder) to reflect this fact. Like points to buoys these are arguably sub-types of PT:LOC or PT:PRO. (An example of a lexical point in Auslan is HEAR (one points to one's ear). EAR is signed by holding one's earlobe between the thumb and index finger.)
PT:GESTURE	A sign that points as part of an involuntary/unconscious gesture (e.g., showing surprise at something) or as part of an enactment of someone doing this.
Points to buoys	
PT:LBUOY	A sign that points to a list buoy handshape. A list buoy is a hand held up with a number of extended fingers, each representing an item 'in a list' which is being discussed or referred to (Liddell 2003).
PT:FBUOY	A sign that points to a fragment buoy. A fragment buoy is the final handshape of a sign that has just been performed which is then held in the signing space while other signing activity continues on the other hand (Liddell 2003). In this case, the other activity is a pointing sign to that fragment buoy.
PT:TBUOY	A sign that points to a theme buoy. A 'theme buoy' according to Liddell (2003) points 'abstractly' marking a theme (it often seems to point upwards). It is held while signing activity continues on the other hand.
Points that are buoys	
TBUOY	A sign that points 'abstractly' marking a theme (it often seems to point upwards). It is held while signing activity continues on the other hand. These are called 'theme buoys' by Liddell (2003), and it is as yet a tentative category, awaiting corpus confirmation of its

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[16] It should be remembered that possessives in Auslan point with the palm of a fist (A) or flat (B) handshape. There is uncertainty regarding any meaning difference between these two forms in Auslan (or if one is a marked form). Handshape changes could potentially signal subtle meaning changes, a possibility which has been raised in BSL, a closely related sign language (Cormier & Fenlon 2009). Corpus data that might help resolve this question for Auslan is not yet available.

Point type	Description of function
	distinctiveness. They would be difficult to distinguish from a depicting sign handshape representing an (abstract) entity (the upright or diagonal one handshape).
FBUOY:PT:(point-type)	A pointing sign which is held while the other hand signs something related to that pointing sign, i.e, a fragment buoy which is itself a pointing sign. These are called 'pointing buoys' by Liddell (2003) but we find they are difficult to distinguish from a co-articulated PT:PRO, PT:LOC or PT:DET signs. Potential candidates are glossed like other fragment buoys, e.g., FBUOY:PT:POSS and FBUOY:PT:PRO3 are possible glosses for fragment buoys of pointing signs. See 2.1.2.2.4.2 below for a discussion of fragment buoys and how they are glossed.

Predication: Types of point can be difficult to keep separate and apply consistently. Consider a pointing sign that immediately follows a referent. In this position, the point may be assigning a locating to an entity ("X is at LOC-Y") or specifying or determining which referent is intended ("X the-there"). In the former case, prosody and pausing tends to indicate if the combination is one stand-alone unit (proposition) and thus it would be coded as an instance of PT:LOC; whereas in the latter case, when the unit is part of a larger CLU determined by no isolating or distinctive prosody over the combination and the presence of a core verb and perhaps a second argument, the point primarily 'points out' the recoverability of the referent, e.g., BOY PT:DET PLAY JOKE 'the boy plays a joke') in which it is coded as an instance of PT:DET. PT:DET is reserved for pointing signs that regularly accompany a lexical sign (before, after or simultaneously with) and together the two signs form a unit which is an argument of an identifiable verb. Interestingly, as a general observation, PTs 'point out' what they refer to (i.e., they specify or determine their referents) so a 'determining' function may be said to be inherent to all points to some extent, even if coded as PT:LOC or PT:LOC.

Demonstratives: It is an open question as to whether Auslan has a distinct category of demonstratives. In Auslan, the demonstrative function appears to be expressed by pointing signs generally (and especially determiners), that have associated with them additional stress, repetition or particular eye-gaze behaviour (a fixed gaze or stare at the target of the point). This sub-type may be distinguished on the grammatical class tier—pending further analysis—but it is not encoded in the ID-gloss. Part of the rationale of the annotation schema proposed here is to test the applicability of grammatical class categories over a large number of instances. It is anticipated that these categories may need to be revised in the light of corpus data.

Reflexives: The expression of reflexivity in Auslan takes on several forms that appear to be confounded by the semantics of English reflexive pronouns that express similar meanings. Until the relationship between the various Auslan forms becomes clear through an analysis of corpus examples—e.g. as subtle meaning differences, or as various stages of lexicalization or grammaticalization—the labels should be treated as tentative. Frequently it is expressed with the lexical sign SELF, directed appropriately, like a pointing sign or an indicating sign, around the signing space. It begins with the mid-finger (IrishK) handshape (or with a one-handed fingerpspelling letter-D handshape) which opens to a spread handshape as it is moved in the direction of the target. It is glossed: PT:SELF.PROetc. The letter-D form often appears to hold the first part of the sign slightly longer than the first form, and has a stronger sense of autonomy (i.e., 'singleness', 'aloneness' or 'without assistance', rather than simple reflexivity). An apparently related form appears to consist of two separate signs: PT:PROetc followed by SEFL.PROetc., (literally "me self" or "you self" etc.); or PT:PROetc and PT:POSSetc(B) (literally "me my", "you your" etc.). These are treated, for now, as two separate signs with two separate glosses. The last mentioned form, it would seem, may actually be the origin of all the above forms (each a reduced from of the preceding, ending in the single sign SELF).

> **A note on 'flying points':** Signers often form a relaxed hand that resembles a pointing hand during continuous signing. The index finger is extended more than the other fingers that are in various degrees of 'closure' yet it is obvious that this is ***not*** a true pointing sign at all because it makes no obvious or congruent contribution to the unfolding discourse. This often occurs on the weak hand, or on the strong hand when there is a switch of hand dominance, while the second hand continues to sign. Like 'non-meaningful' perseveration of handshapes or sign fragments, we do not annotate these 'flying points'.

2.1.2.2.2 Depicting signs[17]

Generally speaking, depicting signs do not have a meaning which can sensibly be listed in a dictionary because their meaning is either too general and predictable (thus uninformative) or too narrow and context specific (thus not *sufficiently* lexicalised). To accommodate this, the gloss annotation for these types of signs is divided into two halves—type-like information precedes a colon and token-like information follows the colon. They begin with the prefix *DS* with an additional letter identifying sub-type—by L for locative, M for movement and displacement, H for handling, and S for size and shape or descriptive, similar to the types described by Liddel (2003):[18]

Prefix	Name	Explanation
DSL	Depicting Sign: Location	Depicts the location of entities
DSM	Depicting Sign: Movement or displacement	Depicts the movement or displacement of entities
DSS	Depicting Sign: Size and shape	Depicts the size and shape of entities
DSH	Depicting Sign: Handling	Depicts the handling of an entity

It should be noted that size and shape depictions, and handling depictions, are sometimes difficult to distinguish from gestures.

A fifth type of depicting sign is recognized and coded in the Auslan Corpus data:

Prefix	Name	Explanation
DSG	Depicting Sign: Ground	The two hands are in a 'figure/ground' relationship. The 'ground' hand is likely to be the signer's weak hand: it may represent a point of departure of a movement or trajectory which is depicted with the other hand. It may be a metaphorical or abstract 'point of reference'.

The depicting sign prefix (DSL, etc.) is followed by a handshape code in parenthesis, as the handshape is one of the most salient features of these signs. Specifying the handshape assists in sorting and analysis of these signs. It may also be followed by and orientation code,

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[17] In many descriptions of SLs these types of signs are often referred to as 'classifier' signs. See Liddell (2003) for a detailed discussion of depicting signs, and Johnston and Schembri (2007a) for how depicting signs are described for Auslan.

[18] In earlier annotation schemas we used the initials PM (for 'property marker'). The terminology was borrowed from Hoiting and Slobin (2002). Indeed, any abbreviation or symbol, consistently applied, would be appropriate, e.g. @ or *CL:* for 'classifier sign'.

especially when describing the most common and repeated types of depictions (see below 'type-like' depicting signs).

The prefixing matter is followed, after a colon, by a description of the meaning of the sign, thus:

(30) DSL/S/M/H/G(HANDSHAPE):BRIEF-DESCRIPTION-OF-MEANING-OF-SIGN

This description can be quite general (e.g. *UPRIGHT-HUMAN-MOVES*), but should certainly not be too specific (e.g. *THE-PERSON-ON-THE-RIGHT-WITH-LONG-HAIR-MOVES-SLOWLY-DIAGONALLY-TO-THE-LEFT-OUT-THE-DOOR-IN-ANGER*). A balance should be struck between the general and particular in each gloss, e.g.

(31)   DSM(1):HUMAN-MOVES   rather than   DSM(1):SHEPHERD-RUNS-LEFT
(32)   DSM(B):ANIMAL-CRAWLS/PADDLES   rather than   DSM(B):TURTLE-MOVES-SLOWLY

Sub-type categorizations are not mutually exclusive, so more than one choice may appear appropriate in some circumstances. For example, many of the DSL types could also be coded as DSM because the annotator may prefer DSM as the appropriate descriptor given the context. One simply gives the best fit for any given example: in the following two exmples the same sign form on the dominant hand is given handling status (DSH) in one but size and shape specifier status (DSS) in the other, as a result of considering the type of sign that immediately precedes each instance (pronominal in the first, verbal in the second):

(33) RH ID-gloss   <u>PRO1SG</u>   <u>DSH(BC):HOLD-CYLINDER(cup)</u>
     LH ID-gloss   <u>DSS(B):FLAT-SURFACE(shelf) </u>
     FreeTrans   I put a cup on a shelf.

(34) RH ID-gloss   <u>HAVE</u>   <u>DSS(BC):OBJECT-CYLINDER(cup)</u>
     LH ID-gloss   <u>DSS(B):FLAT-SURFACE   </u>
     FreeTrans   There's a cup on the shelf.

It should be noted that a literal ground (a low horizontal surface) represented with a flat hand and with reference to which the active hand moves is described/coded here as DSS(B):FLAT-SURFACE rather than as DSG. DSG is used for 'ground' in the abstract or metaphorical sense, or in the perceptual sense (figure/ground), as described above.

The majority of depicting signs usually involve the use of both hands. Often one single object or action is depicted, especially in a two-handed symmetrical depiction of an object. In these cases the gloss annotation of both strong and weak hands will be identical. However, many depictions are complex simultaneous constructions in which each hand usually carries its own semantic load, so the annotator may describe the meaning of each and/or categorize each hand differently, e.g., the dominant as H and the subordinate as S.

The glosses for depicting signs are regularly reviewed and where it appears that the form and general meaning of depictions that are glossed slightly differently are essentially the same, then the glosses are 'regularized' (made more general or abstract) so that they are more easily identified (counted, sorted, etc.) as essentially tokens of the same 'type' of depiction (Johnston, 2010).
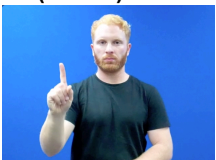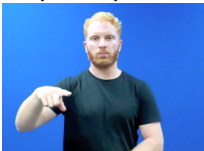
A note on depicting signs and clause argument structure, macro- and semantic-role of constituents: depicting signs often represent a complete 'state of affairs' and many may be regarded as CLUs in their own right. Each hand represents a participant/argument and the movement or placement of the hands represents an action or the relative location of the entities. When this is the case, the grammatical class of the depicting sign as a whole is coded as VD (for 'Verb Depicting'). See section 3.1.2.2 for more details.
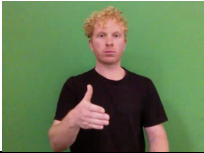
2.1.2.2.3 Type-like depicting signs
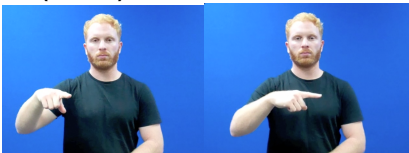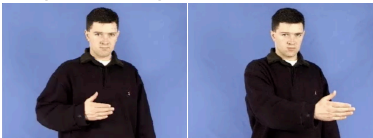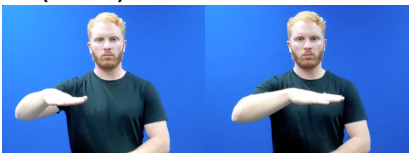
Both the handshape configuration and general orientation of the handshape is added to the type-like description of the most common and reoccurring depictions, e.g., the one handshape held vertically is coded as (1-VERT). A limited set of descriptors is used for these common depictions (Table 6). This list is subject to constant revision and expansion. The semantic weight of the handshape component in depicting signs is known to vary from SL to SL, even though there is considerable overlap. Therefore, the following table is meant to apply to Auslan only. We make no claims for other SLs.
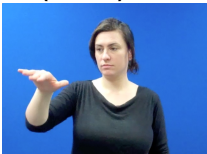
Table 6 A glossing and categorization guide for type-like depictions in Auslan

Regularized gloss of most common depictions	Explanation
Locative depictions	**Used to locate an entity**
DSL(1-VERT) =	"Something tall-ish and thin-ish located at X"
DSL(1-VERT):HUMAN-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located is human. The palm side is assumed to be the front of the person. Additional information can be added (e.g., who, where), but it is not essential.
DSL(1-VERT):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located is an animal. The palm side is assumed to be the stomach side of the animal. Additional information can be added (e.g., what, where), but it is not essential.
DSL(1-VERT):ENTITY-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located is inanimate (real/imagined, concrete/abstract, literal/metaphorical). The palm side is assumed to be the 'front' of the entity, if that is relevant. Additional information can be added (e.g., what, where), but it is not essential.
DSL(1-HORI) =	"Something longish and thin-ish located at X"
DSL(1-HORI):HUMAN-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located (lying down) is human. The fingertip is assumed to be the head of the person and the palm side the front or stomach of the person. Additional information can be added (e.g., who, where), but it is not essential.
DSL(1-HORI):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located (lying down) is an animal. The fingertip is assumed to be the head of the person and the palm side the stomach side of animal. Additional information can be added (e.g., what, where), but it is not essential.
DSL(1-HORI):ENTITY-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is placed in the signing space. It can face in any direction. Use this if the thing that is located ('horizontally') is inanimate (real/imagined, concrete/abstract, literal/metaphorical). If the thing has a front it is associated with the palm side. Additional information can be added (e.g., what, where), but it is not essential.

34

Regularized gloss of most common depictions	Explanation
DSL(2-DOWN) =	"Something two-legged and standing located at X"
DSL(2-DOWN):HUMAN-details	This is the basic form of the annotation for a depicting sign using the two handshape with the fingertips pointing downwards which is placed with a certain orientation in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is human. The knuckle side is assumed to be the front of the person, and the fingertips the feet. Additional information can be added (e.g., who, where), but it is not essential.
DSL(2-DOWN):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the two handshape with the fingertips pointing downwards which is placed with a certain orientation in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is an animal. The knuckle side is assumed to be the front of the animal, and the fingertips the paws/feet. Additional information can be added (e.g., what animal, where located), but it is not essential.
DSL(2-HORI) =	"Something two-legged and reclining located at X"
DSL(2-HORI):HUMAN-details	This is the basic form of the annotation for a depicting sign using the two handshape with the fingertips pointing horizontally which is placed with a certain orientation in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is human. The palm side is assumed to be the front or stomach side of the person, and the fingertips the feet. Additional information can be added (e.g., who, where), but it is not essential.
DSL(BENT2-HORI) =	"Something two-legged and reclining located at X"
DSL(BENT2-HORI):HUMAN-details	This is the basic form of the annotation for a depicting sign using the bent two handshape with the fingertips pointing downwards which is placed with a certain orientation in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is human. The knuckle side is assumed to be the front of the person, and the fingertips the feet. Additional information can be added (e.g., who, where), but it is not essential.
DSL(BENT2-HORI):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the bent two handshape with the fingertips pointing downwards which is placed with a certain orientation in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is an animal. The knuckle side is assumed to be the front of the animal, and the fingertips the paws/feet. Additional information can be added (e.g., who, where), but it is not essential.

35

Regularized gloss of most common depictions	Explanation
DSL(B-LATERAL) =	"Something vehicle-like located at X"
DSL(B-LATERAL):VEHICLE-details	This is the basic form of the annotation for a depicting sign using the flat handshape with the palm facing sideways (laterally) and the fingertips pointing horizontally which is placed in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is a vehicle. The fingertips are assumed to be the front of the vehicle and the little finger edge of the hand the underside. Additional information can be added (e.g., what, where), but it is not essential.
DSL(B-HORI) =	"Something vehicle-like located at X"
DSL(B-HORI):VEHICLE-details	This is the basic form of the annotation for a depicting sign using the horizontal flat handshape with the palm facing downwards (supine) and the fingertips pointing horizontally which is placed in the signing space. It can face in any direction and be placed in any location. Use this if the thing that is located is a vehicle. The fingertips are assumed to be the front of the vehicle and the palm side the underside of the vehicle. Additional information can be added (e.g., what, where), but it is not essential.
Movement depictions	Used to show the movement of entities
DSM(1-VERT) =	"Something tallish and thin-ish moving from X to Y"
DSM(1-VERT):HUMAN-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is human. The palm side is assumed to be the front of the person, and the fingertip the head. Additional information can be added (e.g., who, how), but it is not essential.
DSM(1-VERT):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is an animal. The palm side is assumed to be the front of the animal, and the fingertip the head. Additional information can be added (e.g., name of animal, how it moves), but it is not essential.

Regularized gloss of most common depictions	Explanation
DSM(1-VERT):ENTITY-details	This is the basic form of the annotation for a depicting sign using the upright index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is an entity which is not animate (not human and not animal), concrete and/or literal, i.e., it may be inanimate, abstract or metaphorical. The palm side is assumed to be the 'front' of the entity, and the fingertip the 'top'. Additional information can be added (e.g., what type of entity, what type of literal or metaphoric movement), but it is not essential.
DSM(1-HORI) =	"Something longish and thin-ish moving from X to Y"
DSM(1-HORI):HUMAN-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is human. The index fingertip is assumed to be the front of the person, and the fingertip the head. Additional information can be added (e.g., who, how), but it is not essential.
DSM(1-HORI):ANIMAL-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is an animal. The index fingertip is assumed to be the front of the animal, and the fingertip the head. Additional information can be added (e.g., what, how), but it is not essential.
DSM(1-HORI):ENTITY-details	This is the basic form of the annotation for a depicting sign using the horizontal index handshape which is oriented and moved around the signing space. It can face in any direction and move in any direction. Use this if the thing that moves is an entity which is not animate (not human and not animal), concrete and/or literal, i.e., it may be inanimate, abstract or metaphorical. The index fingertip is assumed to be the 'front' of the entity. Additional information can be added (e.g., what, how), but it is not essential.
DSM(B-LATERAL) =	"Something vehicle-like moving from X to Y"
DSM(B-LATERAL):VEHICLE-details	*This is the basic form of the annotation for a depicting sign using the sideways flat handshape with the palm facing sideways (lateral) and the fingertips pointing horizontally which is located and moved in the signing space. It can move in any direction. Use this if the thing that moves is a vehicle. The fingertips are assumed to be the front of the vehicle. Additional information can be added (e.g., what, where), but it is not essential.*
DSM(B-HORI) =	"Something vehicle-like moving from X to Y"

37

Regularized gloss of most common depictions	Explanation
DSM(B-HORI):VEHICLE-details	*This is the basic form of the annotation for a depicting sign using the horizontal flat handshape with the palm facing downwards (supine) and the fingertips pointing horizontally which is located and moved in the signing space. It can face in any direction and be moved in any location. Use this if the thing that moves is a vehicle. The fingertips are assumed to be the front of the vehicle. Additional information can be added (e.g., what, where, how), but it is not essential.*
DSM(5-HORI) =	"Multiple/many things"
DSM(5-HORI):MANY-HUMANS-details	This is the basic form of the annotation for a depicting sign using the horizontal five handshape with the palm facing downwards (supine) and the fingertips pointing horizontally which is located and moved in the signing space. It can face and be move in any direction. Use this if the thing that moves is many humans. The fingertips face the direction of movement, and may wiggle. Additional information can be added (e.g., who, where, how), but it is not essential.
DSM(5-HORI):MANY-ANIMALS-details	This is the basic form of the annotation for a depicting sign using the horizontal five handshape with the palm facing downwards (supine) and the fingertips pointing horizontally which is located and moved in the signing space. It can face and be move in any direction. Use this if the thing that moves is many animals. The fingertips face the direction of movement, and may wiggle. Additional information can be added (e.g., what, where, how), but it is not essential.
DSM(5-HORI):MANY-ENTITIES-details	This is the basic form of the annotation for a depicting sign using the horizontal five handshape with the palm facing downwards (supine) and the fingertips pointing horizontally which is located and moved in the signing space. It can face and be move in any direction. Use this if the thing that moves is many entities (real or imaginary, concrete or abstract) that are not human or animal. The fingertips often face the direction of real or metaphorical movement , and the fingers may wiggle. Additional information can be added (e.g., what, where, how), but it is not essential.

2.1.2.2.4 Buoys

A buoy is a handshape that is held throughout a stretch of discourse, usually on one's non-dominant hand, and is used as a physical reference point for a referent. There are several types of buoys (Liddell 2003). The handshape can be held in space throughout the articulation of each item, or appear and reappear if two-handed signing demands it be removed in order to produce certain signs. The first part of the annotation gloss for a buoy, begins with a label in upper case that identifies the type of buoy being used. This is followed by a label of the handshape being used in brackets if there is no expected default handshape for the type of buoy, and, finally, after a colon, a short description of what the buoy stands for.

2.1.2.2.4.1 List buoys

When producing a list buoy a certain number of fingers are held stretched out. Each finger refers to entities or ideas that are all related, often sequentially. A handshape code is placed after the gloss LBUOY to indicate the handshape formed by the extended fingers, with a sequence word after a colon to indicate which entity in a series is being indicated. For example, an index finger held up to indicate the first of a series of items would be annotated LBUOY(1):FIRST, as in:

(35)

As each finger is added for each item they are annotated accordingly in turn:

(36)
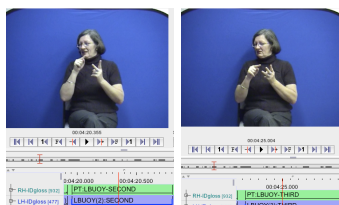
As can be seen from examples (35) and (36), a point (usually on the strong hand) which is directed to a list buoy (usually on the weak hand) is also annotated.

In some cases, the number of extended fingers may not correspond to the number of entities, e.g. if an I handshape buoy (the "bad" handshape in Auslan) were representing the fourth of four objects it would be written:

(37) LBUOY(I):FOURTH

2.1.2.2.4.2 Fragment buoys

In a fragment buoy, the signer uses the fragment or handshape of a previous sign (cf perseveration and shadowing) as a buoy, i.e., it has significance and is referred to, e.g. by pointing or by other signs interacting with it. It is labelled as FBUOY. The ID-gloss of the sign of which it is a fragment is given after the colon. So, for example, if a signer were to leave the non-dominant hand from the sign AEROPLANE in place and then point at it, it would be annotated as follows:

(38)
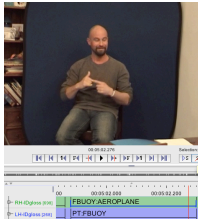
2.1.2.2.4.3 Theme buoys

In theme buoys, the signer uses an extended finger to mark a "theme" or subject, or even moment in time (Vogt-Svendsen & Bergman 2007). These are coded as TBUOYS, and assumed to have a default 1 (index finger) handshape unless otherwise specified.

> **A note on "pointer buoys":** Sometimes, rather than the signer using a finger to represent an entity—as a LBUOY or as a DSL(1):ENTITY—signers point to a location in space that represents that entity or idea and then continue to point to that location while signing something related to that referent. Liddell (2003) calls these "pointer buoys". This could be annotated as PBUOY or PTBUOY, followed by the meaning (from context) of the location or referent. The default handshape is, once again, an extended index finger unless otherwise specified. So, for example, if a signer were to discuss a man and then point to a location referring to that man and hold that handshape and point while continuing to sign on the other hand, this could be annotated as PTBUOY:MAN etc. However, from our experience with corpus annotations in Auslan many of these are indistinguishable from TBUOYS (and are thus glossed as such) or can equally be seen as instances of any one of other point types listed in Table 5 (PRO, LOC, DET) which are held and relevant to the discourse as it unfolds, i.e., they are FBUOYS. So the example just given above would be annotated as FBUOY:PT:PRO3SG instead of PTBUOY:MAN during the period in which the initial point is subsequently held.

2.1.2.2.4.4 Other hand/pointing/holding etc.

In list buoys primarily, but also sometimes with theme buoys or fragments, the signer usually grabs or points to a relevant finger of the buoy for each item in the list. The dominant hand usually does the pointing, most often at a specific finger of the buoy (or it may hold or pinch it). This is annotated on the dominant hand according to the finger identified and whether it is a pointing or holding action. PT is used for 'point' and HOLD is used for 'hold'. After a colon

one writes *buoy* and the finger (i.e., the sequence order) which has been singled out in the act of pointing or holding.

(39)
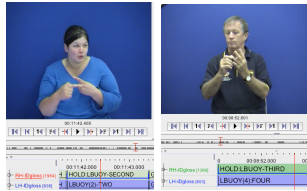
There is no need to repeat information about the buoy itself (handshape and/or number of entities) on the annotation for the dominant pointing hand because the annotation for the subordinate (weak) hand has that information about the buoy encoded.

Explanation of placement of handshape information in depicting and buoy sign glossing strings: Unlike other glosses, the handshape code specification for depicting signs and buoys is not placed at the end of the glossing string; rather, it comes at the beginning of the string immediately after the sign type specifier (DS, LBUOY, etc.). The reason is that even though there are a number of known typical handshapes used in many depicting signs (e.g., the 'classifier'—proform—handshapes such as the upright 1 for *person*, or horizontal sideways B or *vehicle*) and list buoys (e.g., the 3 handshape for 'three entities'), a wider and more diverse range of handshapes than have hitherto been identified, e.g., feet may be represented with B, H, or P handshapes, and the 8 handshape can also be used for 'three entities'. The convention assists in searching and sorting depicting signs and buoys by similarity of form and thus identify form/meaning correspondences. One cannot, and should not, assume that because the description of the depiction mentions a car, for example, that B handshape, held sideways, has been used. It needs to be stated explicitly. Of course, this applies to all parameters of any depiction. We do however prioritize handshape in the glossing because of the importance of debate about 'classifier' handshapes in the SL linguistics literature.

2.1.2.3 Non-lexical signs (non-conventional symbolic units/gestures)

As with ID-glosses, a relatively small set of annotation and glossing conventions need to be followed in order to ensure that similar types of non-lexical signs are glossed in similar ways. Without such conventions, these categories of signs cannot be easily extracted from the corpus for analysis and comparison.

2.1.2.3.1 Manual gestures

When communicating in a SL, signers do not simply produce one conventionalized sign after another, to the exclusion of gesture, as if all their bodily movements and articulations were, by definition, 'linguistic'. (In this context I mean by 'linguistic' *fully conventional language-specific signs.*) Gestures, which can be culturally shared or idiosyncratic, occur commonly in signed discourse just as they do in spoken discourse. It is an empirical question as to whether the major identified categories of co-speech gesture (to the degree to which these categories are accepted among gesture researchers)—such as gesticulations (including beats), mime/enactments, and emblems—also occur in naturalistic stretches of communication in a SL and if they are or can be manifested in a SL in the same kind of way.

Some gestures common in the majority SpL culture are highly conventionalized (they are *emblems*) and are shared with the deaf community. Accordingly, they are not classified as gestures and are listed in a dictionary of a SL and can thus be given an ID-gloss. Indeed, they often undergo further language-specific lexicalization in the SL and this is also recorded in the dictionary.

Other culturally shared gestures may be 'pre-emblematic' within the speaking community, yet fully emblematic (i.e., lexicalized) within the signing community. They are similarly listed in the lexicon and not classified as gestures here.

However, there are yet other gestures, some of them culturally shared also, that have not become lexical Auslan signs. They will not be listed in a dictionary of the language and will therefore not have an assignable ID-gloss. These are what are classified as (manual) gestures here. It is these non-lexicalized gestures, which may be culturally shared or idiosyncratic, that need to be identified in the basic primary gloss-based annotation.

There is no reason for annotators to be reluctant to categorize as gestures manual and non-manual behaviours that do not appear to fit easily or readily into the category of conventionalized or depicting signs. Large scale corpus analysis of identified gestures will play an important part in determining how these gestures function within Auslan.

As with depicting signs, one can identify elements of both the meaning and the form of a gesture, depending how regular the gesture appears to be, in this general pattern:

(40) TYPE:MEANING

However, because gestures are to a large part non-conventional signs, in the majority of cases when one identifies the sign as a gesture in an annotation also needs to describe its meaning (heavily dependent on the context precisely because it is essentially non-conventional.) An annotation begins with a type code 'G' for 'gesture',

e.g. G:DESCRIPTION-OF-MEANING, as in:

(41) G:HOW-STUPID-OF-ME   *not*   G:HIT-PALM-ON-FOREHEAD

Since one can see a sign's form in the linked movie clip, it is not essential to have formational information separately encoded in an annotation. By annotating the types of meanings encoded in gestures, it will be possible to see (a) the types of meanings commonly expressed through gesture and (b) the degree of conventionalization a gesture-meaning pairing may be undergoing by comparing annotations of similar meanings.

2.1.2.3.2 Type-like gestures

Both the handshape configuration and general orientation of the handshape is added to the gloss for some of the most common and reoccurring types of gestures in the follow format:

(42) TYPE(FORM):MEANING

For example, the 5 handshape with palm down is coded as (5-DOWN). It is found in a common dismissive gesture (the hand is waved downwards in front of the signer). There is a recurrent pattern in form and meaning, yet the sign is not a lexical Auslan sign (it appears to be a culturally shared gesture). It is thus written as G(5-DOWN):PHOOEY, rather than simply as G with a context specific description of its meaning, e.g. G:OH-FORGET-IT. A limited set of descriptors is used for these common gestures are described in the following list. The list is not fixed or final and continues to grow as semi-regular gestures appear to emerge from the corpus. (Users logged in to Auslan Signbank with researcher privileges, can see video clips of these gestures if they search for the keyword used on the meaning half of the ID-gloss. These are not publicly viewable.)

Table 7 A glossing and categorization guide for recurring gesture 'types'

Gloss annotation	meaning
G(5-UP):WELL	relaxed spread hand(s), palm up
G(5-DOWN):RIGHT	relaxed spread hand(s), palm down (right = "okay, then")
G(5-DOWN):PHOOEY	relaxed spread hand(s), palm now, hand drops
G(5-WIGGLE):UMM	relaxed spread hand(s), fingers wiggling
G(1-LIPS):ERR	index finger held to the lips, palm facing signer
G(5-TOWARDS):AHH	relaxed spread hands, palm towards each other, fingers up
G(5-AWAY):HOLD-ON	relaxed spread hand, palm away from signer

In so doing, it becomes possible to identifying the most common gesture form/meaning pairings. Some may be reclassified as lexicalized signs, some may simply be identified as gestures identical with the surrounding speaking community and fairly stable in form and meaning, but not properly classified as signs unique to Auslan.

Take the example of 'well'. The gesture with upturned hands is called *G(5-UP):WELL*. However, this is a very common gesture both cross-culturally and cross-linguistically (e.g. East/West, deaf/hearing, NGT/Auslan). It can have many different meanings and functions, even in a SL. In Auslan, it is often a discourse marker meaning 'well'. In other environments it means something like 'don't know', and it yet others it means something like 'shocked'. When hundreds of annotation files have been created and a large number of examples are available for comparison, some of these gestures may be seen as having subtly distinct forms or functions that may justify re-categorisation and re-glossing. For example, some instances of forms of *G(5-UP):WELL* may be reassigned as instances of a lexical sign of a certain type (e.g. WELL as a discourse marker).

This is one of the benefits of using a corpus as part of empirical language description but in order to do so, it requires that annotators are as consistent as possible in assigning ID-glosses or glossing conventions to all types of signed units: fully-lexical signs, partly-lexical signs, non-lexical signs, and gesture. Once again, as with depicting signs, reviewing and regularizing of sign annotations helps identify recurrent gestural patterns.

Of course the annotation conventions described here for gestures are simply identifying unit-like bounded articulatory events in the signing stream. There may be every reason to believe that some manual gestures may occur simultaneously with the articulation of some signs, e.g. pointing actions 'inside' indicating verbs. These behaviours are captured in the

annotation conventions for sign modification and sign transcription. It is the theoretical analytical framework that interprets these modifications as gestural in nature. The conventions for annotating gesture units described above is not meant to preclude this type of analysis.

2.1.2.3.3 Non-manual gestures

Some gesture units are not hand-centred (they are body-centred, head-centred or face-centred) and involve no new manual activity. They are usually produced during periods of constructed action (CA) (see 2.2.2.2) and often also involve body partitioning events (see 2.2.2.3). Since the ID-glossing tiers are primarily dedicated to glossing bounded sign-like manual articulations, these non-manual gestures would not normally appear on the ID-gloss tiers unless an exception was made.

Making an exception is precisely what is recommended and practiced in the Auslan Corpus annotations. Otherwise, if the production of a non-manual gesture is the only new and most salient activity occurring during a given period of time in an utterance, and a gesture annotation gloss placeholder is not created on one of the glossing tiers, one may misunderstand the significance of these empty periods on the glossing tier, especially if doing complicated tier searches in ELAN or reviewing a section of annotations in an open ELAN window. In the former situation, searches conducted across ELAN annotation files that involve the glossing tiers may miss significant numbers of non-manual gesture units—when they are the only activity taking place—and thus create the impression that 'nothing of significance' was occurring during this period. In the second instance, it is not easy to view all tiers at the same time in ELAN because there are simply too many of them. Thus including some reference to fairly obvious and important non-manual activity on the ID-gloss tier that is not accompanied by a manual sign is helpful.

(Despite the fact that the corpus annotations are not intended to function as a transcript of the text (see (Johnston 2010b)), this mistaken impression is particularly likely to happen if one was to look at ID-glosses alone—as a kind of pseudo 'transcript'—divorced from the primary media, e.g. if looking at a file of exported annotations from the ID-gloss tier.)

Of course, the non-manual behaviour/gestures do also appear as annotations on the head, face, mouthing, and body tiers respectively when necessary (this is dealt with below in the discussion of these tiers). We need only mention here that the gesture prefix, G (for 'gesture'), can be used with NMS (for 'non-manual sign') in parentheses to remind the casual observer that there is important non-sign non-manual gestural activity at that point in the text, further details of which can be found on other relevant tiers, e.g.[19]

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[19] Henceforth, in multi-tier examples, only dominant hand glosses will be shown unless both need to be seen, e.g., because there is a switch in hand dominance or two signs are articulated at the same time, one on each hand.

(43)

ClauseLikeUnit(CLU) [45]	00:00:09.500	00:00:10.000	00:00:10.500	00:00:11.000
	AVB_c7a_A_F_64_N_CLU#05			
Face [1]				SHOCK/SURPRISE
MouthGestF [2]				ON3(OPEN WIDE)
RH-IDgloss [109]	TOMORROW	MORNING		G(NMS):LOOK-SURPRISED
LitTransl [45]	next morning (boy) looked-down shocked-and-surprised			
CA [28]				[CA:BOY]

If the stand alone non-manual gesture involves the mouth alone then M (mouthing) or MG (mouth gesture) prefixes are used instead of G, as in (44) and (45).

(44)

ClauseLikeUnit(CLU)	00:00:47.600	00:00:47.800	00:00:48.000	00:0
	AFL_c3_A_F_52_N_CLU#43			
Mouthing [29]	BECAUSE			
RH-IDgloss [158]	M:BECAUSE	GOOD	EXPERIENCED	
LitTransl [54]	because (christmas party) good experience			

(45)

ClauseLikeUnit(CLU) [55]	08.000 02:08.200 02:08.400 02:08.600 02:08.800 02:09.000 02:09.200 02:09.400 02:09.600 02:09.800 02:10.000	02:10.200 02:10.400 02:10.600 02:10.800 02:11.000 02:11.200 02:11.400 02:11.600 0
	BKP_c3_B_F_36_N_CLU BKP_c3_B_F_36_N_CLU#17	BKP_c3_B_F_36_N_CLU#18
Mouthing [7]	M(EAN) MEXICO	HOME
MouthGestF [4]	OPEN	BLOW
RH-IDgloss [423]	PT:PRO3SG PT:PRO2SG SIGN FS:MEXICO	MG:BLOW LUCKY ALRIGH ARRIVE GOOD-2H
CA [6]	[CD:TEACHER]	[CD:TEACHER]
LitTransl [16]	he (surprised say) "You mean in Mexico?!"	"oooo! lucky alright arrive home ok"

Of course manual and non-manual gestures of all types, i.e., including mouth gestures and mouthing, may also be part of periods of CA or dialogue, as in (45).

2.1.2.3.4 Fingerspelling

Any time a signer uses fingerspelling, this is annotated with the prefix *FS* for 'fingerspelling' followed, after a colon, by the word spelled.

(46) FS:WORD

Often not all the letters of a word are spelled through sheer speed of fingerspelling yet it is clear what that target word is. In most of these cases, just the target fingerspelling is annotated. Reduced or incomplete fingerspelling is far too common in naturalistic signing to be precisely recorded each time in a primary annotation. (Indeed, it is often difficult to see that letters are missing without actually slowing down the video playback.)

Other times, missing or incorrect spelling may be due to an interesting slip of the hand, or a consistent orthographic error and may be noteworthy, e.g. it may be a pattern found across many singers, or an emerging shared abbreviation. In these cases, the actual fingerspelled letters can be put in brackets after what is clearly the target fingerspelling, thus:

(47) FS:WORD(WOR) *not* FS:WOR

(48) FS:WORD(WRD) *not* FS:WRD

(49) FS:SO(SI)   *not* FS:SI

Of course, consistently reduced fingerspelling, on the same pattern across most signers, is often an indication of nativisation and lexicalization of a fingerspelling routine. Glosses may need to be adjusted at some later time to reflect this fact, if corpus evidence warrants it.

It is often difficult to know with any certainty if the omission of letters in the finger-spelling of a word constitutes an 'error' with respect to expected English word classes. Unless clearly incomplete as judged from the context (e.g. there is a clearly identifiable mouthing that conforms to a word in English belonging to a particular word class), fingerspellings that are acceptable strings in English should be left alone. Missing letters at the end of a word are particularly problematic and would normally only be completed if something in the production or context clearly indicates the target word, e.g. if mouthing indicates awareness of the appropriate word form and spelling, or English requires another form.

(50) FS:CURLY(CURL)

(51) FS:TOO(TO)

If the fingerspelling is for multiple words, *a new annotation* per word is begun even if it is one continuous act of fingerspelling.

(52) FS:MISS   FS:KENTWORTH   *not*   FS:MISSKENTWORTH

By following these conventions, it makes it possible for the number of fingerspellings to be counted and the types of words that are fingerspelled to be identified.

If the form of a lexical sign is a single (and sometimes doubled) fingerspelled letter which could mean various things according to context, the letter and the word it stands for are written in the annotation. Unless the gloss-based annotations for these signs follow a consistent pattern, it will not be possible to easily compare these signs to determine which meanings/words are conveyed using single letter 'initialisation'.

(It should be remembered that some doubled letter forms are lexical signs in their own right and have their own unique ID-glosses in the database, e.g. doubled letter 'd' is DAUGHTER. The fact that these signs are derived from fingerspelling is already recorded in the lexical database, Signbank.)

(53) FS:M-MONTH, FS:M-MINUTE, FS:M-MILE

(54) FS:Y-YEAR, FS:Y-YARD

(55) FS:GG-GOVERNMENT, FS:GG-GOVENOR-GENERAL, FS:GG-GARAGE

2.1.2.4 Indecipherable signs

If it is evident that a participant in the text is making a sign of some kind but its form is unclear and it is impossible to determine what that sign is, let alone if it is fully-lexical, partly-lexical or non-lexical, one creates an annotation field for that sign and glosses it as INDECIPHERABLE. This means its form and meaning cannot be clearly determined.

2.1.2.5 Tokenization of the video for basic glossing

Speaking and signing produces a continuous stream of words and signs and, just as there are no silences between words when we speak (except, of course, when there are natural or deliberate pauses), there are no real gaps between signs when signing. Signers do not (and cannot) crisply articulate one sign after another, returning to a neutral position between each

sign, nor can a sign sequence be articulated without any transitional movements between each sign. Ignoring or editing out transitional movements falsely implies periods of no signing activity ('silence'). [20]

There should therefore be relatively little space (i.e., time) between each sign annotation field, unless there is an obvious or deliberate pause. However, it is recommended that some kind of gap (at least a frame) be left between sign annotation fields to ensure that time overlaps or alignments are correctly identified during multi-tier searches. There have been reports that abutting annotation fields can result in false or unexpected search results based on overlaps.[21]

As a general rule a sign starts:

a.   when the hand or hands appear to change direction, having completed all movement relevant to articulation of the just articulated sign, and/or

b.   when the hand or hands start to change handshape, assuming one that is not part of the just articulated sign.

A sign ends:

a.   just before the hand or hands appear to change direction, having completed all movement relevant to articulation of the current sign, and/or

b.   just before the hand or hands start to change handshape, assuming one that is not part of the current sign.

c.   when the hand or hands begin a return to a rest position (e.g. folded arms, hands on hips, laps, or some supporting surface or object, or arms resting at the side of the body).

A pause in which the hand or hands are held steady in a location (with the same handshape being maintained) is considered to be a continuation of the articulation of the sign if it appears deliberate and meaningful. The annotation field continues until the hold is released and the hands return to rest or move in order to perform other sign.

2.1.2.5.1 Shadowing, anticipation and perseveration

For the purposes of primary gloss-based annotations, if the non-dominant hand is merely shadowing one or more features of what is considered to be a one-handed sign on the dominant hand (e.g. partially forming the handshape, or partially copying the movement) in an apparently involuntary way, or at least without any apparent communicative intent or discernible addition to meaning, then the activity on the non-dominant hand is ignored. Similarly, if the non-dominant hand appears to be anticipating or preparing for the next sign in a very minor way while another sign is still being produced on the dominant hand, this minor activity is

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[20] This could have serious consequences when calculating the ratio of the co-temporal duration of non-manual prosody (e.g. facial expressions, eyebrow raise, etc.) or spatial displacements (e.g. body shifts) with manual articulations as a part of total text time.

[21] For example, if the end time of one annotation field is the start time of another and this is mapped on more than one tier, then it appears that a query based on annotations being fully-aligned or overlapping can give unexpected results with adjacent annotations also being counted.

not normally annotated as part of the articulation of the sign that is eventually produced. An annotation for the non-dominant hand may, however, begin 'early' in circumstances in which the non-dominant hand actually goes on to articulate a one-handed sign on the non-dominant hand—alone or with a second sign simultaneously articulated on the dominant hand.

If weak activity on either hand appears to be a perseveration (the continuation of part of a just articulated sign as it slowly relaxes a neutral handshape or rest position), one does not normally prolong the annotation field for that sign to include all this fading activity, especially if another sign has clearly begun or is being articulated on the other hand, and that hand is articulated without any apparent reference to the perseverating hand. One only annotates information for the dominant hand in these cases, because the hand movements on the non-dominant hand are not meaningful.

If, however, the production of the next sign on the clearly active hand appears to be articulated with reference to the 'perseveration' in some way, then both hands are part of a simultaneous co-articulation of two signs and the hand that is held needs to be annotated. The period of continuation is annotated separately as a fragment buoy (or point buoy if it is a pointing sign), rather than simply extending the duration of the annotation field for that hand/sign. (We have found this approach makes it simpler to deal with exported annotations in spreadsheets, e.g., for quantifying or sorting the instances of this phenomenon.)

In brief, one always creates annotations for both hands in two-handed signs, or when each appears to be doing something deliberate and meaningful even if the sign is not two-handed.

It goes without saying that shadowing, anticipation and perseveration are not ignored when temporal phenomena of this kind are the very subject of investigation. Studies of this type would add this information to an existing annotation file (e.g. by duplicating the ID-gloss tiers, renaming them as, say, 'phonetic duration tiers' and adjusting the duration of annotation fields accordingly).

2.1.2.5.2 Repetition or reiteration

Sometimes a sign is repeated and sometimes the movement component of a sign is modified by repeating it. It is often difficult to distinguish between the two. Each has different consequences on the meaning of a sign. If a sign looks like it would be translated with a single English word that would have grammatical modifications (e.g. WAIT repeated translated by 'waiting' instead of 'wait') or by a phrase (e.g. WAIT repeated translated by 'wait for a really long time') then one annotation and gloss is used. In this case the gloss would be WAIT. The modifications (repetition) of the sign are treated as *grammatical* in nature. Grammatical information is coded on other dedicated tiers of the annotation file.

However, if a sign looks like it really is being repeated (i.e., is said more than once) and would equally be translated by a repeated English word, then each instance should be annotated separately. (If unsure, it is recommended that annotator makes a comment on the *comments* tier.)

(56)

2.1.2.5.3 Compounds and collocations

Two signs that are regularly signed together may simply be collocations but may also be multi-word lexical items or conventional compounds in Auslan.

Collocations are an habitual pairing of two signs or words—the appearance of one leads one to expect the other, in a particular order (e.g. 'black and white' or 'I think' in English or KNOW PRO2SG in Auslan). Collocations are written as two separate annotations, no matter how frequently they appear together, or how rapidly the two are signed in sequence.

By contrast, a multi-word lexical item is an erstwhile collocation of two separate signs that have become lexicalized as a unit. For example, in English the sequence of words *cash machine* or *cash dispenser* are multi-word lexical items (they mean an automatic teller machine or ATM). An ATM cannot be referred to as *money machine* (which would mean a machine for making money). This appears to be unlike the sequence of signs CASH MACHINE or CASH DISPENSER in Auslan because one appears able to reverse the order (MACHINE CASH) as well as refer to the object as a MONEY MACHINE, or MACHINE MONEY. If the annotator does come across any sequence that does appear fixed and lexicalised the two signs would be treated as a unit and a gloss created (it may well be a complex gloss in which the words were separated by a hyphen if no single word exists in the glossing language, English).

In order to determine if two signs may be fused into an independent lexical item one needs to satisfy the following conditions:

- the meaning of the whole is not predictable from the elements
- it is not possible to insert another sign between the two elements at all, or without changing the meaning of the particular utterance.

If these two conditions apply to an observed collocation, the signs can be annotated as a (multi-word) lexical item.

If additionally, there is some kind of phonological reduction between the two members it would be treated as a compound. A compound would usually be written as one single sign annotation. Most compounds will already be found with distinct ID-glosses in the Auslan lexical database, e.g. MOTHER^FATHER is a standard Auslan compound meaning PARENTS, and WRONG^MIND is a compound meaning GUILTY. The ID-glosses are PARENTS and GUILTY, respectively. If a pairing of signs cannot already be found in the dictionary as a compound, and the above criteria appear to apply, the sign should be written as one sign with the two sign elements separated by a caret symbol (^). A comment should be made on the *comments* tier that this is a potential compound. A unique ID-gloss will be assigned later if its compound status is subsequently recognized.

2.1.2.5.4 False starts and repairs

In spoken and SL discourse, especially in unplanned face-to-face communication, there can be many instances of false starts: a speaker or signer begins to articulate a word or sign but does not complete it for various reasons. It is usually followed immediately or a few words or signs later by a repair—what was apparently intended in the first instance. When this is clearly the case the convention is to suffix the ID-gloss with the words 'false-start', in parentheses, thus:

(57)

Identifying false starts in this way helps one quickly see why some referents are not or should not be included in argument structure tagging. It also enables one to later extract these types of errors from the corpus for further analysis as to their characteristics, and the timing and nature of the subsequent repair.

2.2 Detailed annotation

SLs are not simply produced on the hands. SL users recruit the space around the signer as well as non-manual behaviours such as body postures, head movements, eye gaze, facial expressions, mouthing of SpL words and mouth gestures. Non-manual activity may be localised at the level of the individual sign, but it is a phenomenon that often spreads over more than one sign and is thus equally associated with phrases, clauses or larger meaning units, including enactments. For this reason, all these tiers in the ELAN annotation file are independent tiers because the time alignments are not bound by any lexical or clausal unit. The alignment or co-occurrence of these prosodic annotations with sign or multi-sign units can be subsequently identified and quantified by searches and used as evidence of their role in the lexico-grammar.

2.2.1 Annotation of non-manual features or prosody

The major tiers used in the annotation of non-manuals are listed in Table 8.

Table 8 Non-manual behaviour tiers

Parent tier ↳ Child tier	Expanded name	Linguistic type
Body	Body	BasicAnnotation
Face	Global facial expression	BasicAnnotation
Head	Head	BasicAnnotation
Gaze	Direction of eye-gaze	BasicAnnotation
Eye&Brow	Eyes and brow	BasicAnnotation
Body	Body	BasicAnnotation
Mouthing	Mouthing (of words)	BasicAnnotation
↳ MouthingGCl	Grammatical class of word mouthed	GramCls
MouthGestF	Mouth gestures form	BasicAnnotation
↳ MouthGestM	Mouth gestures meaning	BasicTag

2.2.1.1 The body tier

There appear to be several functions of body movements in Auslan and the corpus annotations are intended to help describe and categorize these functions further (see section 2.2.2.2 for more discussion). The body tier is used to code movements that are salient and appear to be linguistically meaningful. Changes are described with respect to the neutral position which is assumed to be upright, centred on the vertical axis, and facing the addressee. The annotations in the tier delimit the time span of the described behaviour. Body movement includes leaning or shifting the torso in a particular direction and/or swivelling or rotating the torso—often very subtly—so that it orients in a particular direction.

Briefly, these body movements are usually used to indicate that a part of a text (a single sign or a sequence of signs) is to be associated with a referent, a participant or a location which is indicated by direction of a movement or the orientation of the torso (e.g. left, right, back, or front of the signing space). The referent(s) may be real or imagined, concrete or abstract, animate or inanimate.[22]

The body shift may itself establish a referent at a location, but usually it exploits an association which has already been established in the text by (i) locating a referent at a location by pointing to that location when that referent is topical or in focus (i.e., has just been signed), (ii) articulating a non-body anchored sign at or towards a location; or (iii) by a previous body shift. In the following example, in a discussion of teaching and communication methods used with deaf children, the use of speech and hearing is assigned to the left of the signer and the use of sign language is assigned to the right of the signer:

(58)

2.2.1.2 The face tier

This tier is used to describe facial expressions in a global way. The annotations on the tier delimit the time span of the described expression. The expressions may be given more detail descriptions on the other non-manual tiers (e.g. head, gaze, eye, brow, and mouth).

2.2.1.3 The head tier

This tier is used to code head movements that appear to be salient and/or linguistically meaningful. Like other non-manual tiers, the head tier is coded with respect to the neutral

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[22] The referent may even be a linguistic entity, such as a clause (see Johnston 1992).

position—head level and upright, facing the addressee. The annotation tier delimits the time span of the described non-manual behaviour.

2.2.1.4 The gaze tier

This tier is used to code eye gaze movements that appear to be salient and/or linguistically meaningful. It is coded with respect to the neutral position—the signer facing and looking at the addressee. The annotation tier delimits the time span of the described non-manual behaviour. As at June 2010, this tier has only been used to annotate the gaze behaviour during the production of pointing signs. The codes used are: a for 'addressee', t for 'target', o for 'other' or z for 'cannot be coded', i.e., is not visible or can't be determined.

2.2.1.5 The eye and brow tier

This tier is used to code eye and brow movements that appear to be salient and/or linguistically meaningful. Like other non-manual tiers, it is coded with respect to the neutral position—in this case, relaxed and open. They are combined into one tier as only the most salient or obvious movements are likely to be coded in the first instance (e.g. raised eyebrows with widened eyes, lowered eyebrows with narrowed eyes). As with the manual transcription tiers further independent or daughter tiers may need to be created for more detailed analysis of these behaviours. The annotation tier delimits the time span of the described non-manual behaviour.

2.2.1.6 Mouth actions: mouthing[23]

Mouthing, the movement of the lips as if saying a word or part of a word of the ambient SpL (in this case, English) is annotated on this tier. Even though this is an independent tier, all mouthings are annotated by selecting the ID-gloss first, before clicking on the mouthing tier under the ID-gloss when adding the annotation (the annotation field will be automatically aligned with the ID-gloss annotation field). Different types of mouthings are given different annotations (Table 9).

Table 9 The annotation schema for mouthings

M-type (mouthing)	Annotation	Examples
Complete articulation	COMPLETE-WORD	RACE, RABBIT, VILLAGE, FAR
Initial segment	I(NITIAL)	V(ILLAGE), SA(ME), DIFF(ERENT), SH(EEP)
Medial segment	(ME)DI(AL)	(NO)TH(ING), (RE)MEM(BER) , (B)E(ST)
Final segment	(FI)NAL	(SUCCESS)FUL, (FIN)ISH, (IM)PROVE. (TO)DAY
Initial & final segment only	IN(I)TIAL	F(INI)SH, D(EA)F, S(UC)CESFUL
'suppressed' articulation*	(SUPPRESSED)	(LADY), (HAVE)
unreadable*	unreadable	
anticipatory (regressive) spreading	MOUTHING-regr	ID-gloss PT:PRO1SG EXPLAIN Mouthing EXPLAIN-regr EXPLAIN = *"I explained…"*
delayed (progressive) spreading	MOUTHING-prog	ID-gloss FINISH PT:PRO1SG Mouthing FINISH FINISH-prog = *"….I finished"*

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[23] As used in the study of mouth actions in Auslan: Johnston, van Roekel & Schembri (2016).

* A 'suppressed' mouthing annotation is used in a few instances where the annotators are convinced there is underlying movement congruent with articulating a word associated with a sign, however the mouth does not actually open, e.g. the 'y' of 'lady' when signing LADY. They are identified to distinguish them from mouth gestures, e.g. a EE-like mouth gesture. Where annotators were certain a word was being mouthed—there are articulatory motions— but were simply unable to lipread it, it is annotated as *unreadable*.

2.2.1.7 Mouth actions: mouth gestures

Mouth gestures are all other mouth actions that are not mouthings. The types of mouthings recognized to date in the annotation of the Auslan Corpus are illustrated in Figure 5.
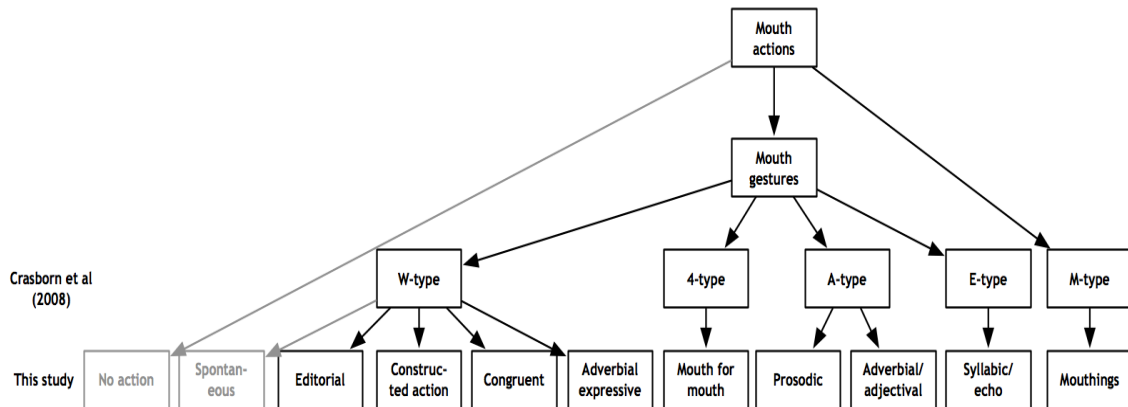
Figure 5 Types of mouth actions annotated in the Auslan Corpus

A brief description of the form of the mouth gesture is inserted in the MouthGestF (Mouth gesture form) annotation field. The meaning of the mouth gesture can also be entered on the daughter tier *MouthGestM*. The type of annotation depends on the mouth gesture type (Table 10).

Table 10 The annotation schema for mouth gestures

Mouth gesture	*MouthGestF* tier begins with	*MouthGestM* tier contains
E-type (echo or empty)	SYLL:GLOSS (= Syllable)	various meanings as needed Tag tier: -IM (imagistic), -MI (mimetic), -ME (metaphorical)
A-type (modifying)		
prosodic	GLOSS/CODE(H) (H = held) (see Table 3)	meaning glosses: ACTIVITY, EMPHASIS or
prosodic (non-specific)	No annotation	Tag tier: -MH (*mouthing held*)
adverbial	Mouth gesture code (see Figures)	meaning glosses: LARGE-AMOUNT, CARELESS, UNPLEASANT, SMOOTH, EASE, EFFORT, SMALL-AMOUNT Tag tier: -IM (imagistic), -MI (mimetic), -ME (metaphorical)
4-type (mouth for mouth)	CMO (= Congruent Mouth Only)	ENACTMENT
W-type (whole-of-face)		
spontaneous	no annotation	
editorial	COMMENT	no further annotation or various meanings as needed
CA (constructed action)	CA: (= Constructed Action)	no further annotation or various descriptions as needed,

Mouth gesture	*MouthGestF* tier begins with	*MouthGestM* tier contains
CA using an A-type	CA:GLOSS/CODE (Table 3)	add after the CA: the A-type mouth gesture gloss/code
congruent	CWF (=Congruent Whole Face)	meaning glosses: EXPRESSION, ENACTMENT, EMPHASIS
adverbial expressive	CA:ADV (= Adverbial)	EXPRESSION
Spreading mouth gesture	ANNOTATION-cont	on all subsequent co-articulated manual sign(s)

The codes that are used are listed in (Table 11)

Table 11 Mouth gesture form codes and glosses used in this study and their equivalents in the BSL coding schema (Sutton-Spence & Day 2001) from which they were adapted.

'Closed' mouth gestures			'Open' mouth gestures			Tongue-related mouth gestures		
Auslan study codes	SS&Day	Auslan study glosses	Auslan study codes	SS&Day	Auslan study glosses	Auslan study codes	SS&Day	Auslan study gloss
CN1	CN14	LIP-CURL	ON1	OL12	OPEN	OT1TL	OL18	TONGUE
CN2	CN16	WIDE	ON2	OL13	OPEN	OT1TM	OL19	TONGUE
CN3	CN15	N/A	ON3	OL13	OPEN	OT1TR	OL20	TONGUE
CN4	CN17	DOWN	ON4	N/A	DOWN	OT1BL	OL18	TONGUE
CN5	CN18?	LIPS-PRESSED	ON5	N/A	N/A	OT1BM	OL19	TONGUE
CN6	CN18	N/A	ON6	OL12	SLIGHTLY OPEN	OT1BR	OL20	TONGUE
CN7	CN19	TRILL	ON7	OL13	WIDE	OT1WL	OL18	TONGUE
CN8	CN20	BLOW	ON	OL13	WIDE	OT1WM	OL19	TONGUE
CN9	CN22	TRILL	ON9	N/A	DOWN	OT1WR	OL20	TONGUE
CN10	CN21	TRILL	ON10	N/A	LIP-CURL	OT2	OL15	TONGUE
CN11	CN23	LIPS-OUT	ON11	OL14	BOTTOM-LIP-OUT	OT3	N/A	TONGUE
CN12	CN7	LIPS-OUT	ON12	OL6	SLIGHTLY OPEN	OT4TL	OL9	TONGUE
CN13	CN8	LIPS-OUT/ TRILL	ON13	OT7	WIDE	OT4TM	OL9	TONGUE
CN14	CN9	LIPS-OUT	ON14	OL7	WIDE	OT4TR	OL9	TONGUE
CN15	CN12	TRILL	ON15	N/A	DOWN	OT4BL	OL10	TONGUE
CN16	CN13	LIPS-OUT	ON16	OL8	LIPS-OUT	OT4BM	OL10	TONGUE
CN17	CN10	TRILL	ON17	N/A	BLOW	OT4BR	OL10	TONGUE
CN18	CN11	TRILL	ON18	N/A	BLOW	OT4WL	OL11	TONGUE
CN19	CN2	TONGUE	ON19	N/A	BLOW	OT4WM	OL11	TONGUE
CN20	CN3	BOTTOM-LIP-OUT				OT4WR	OL11	TONGUE
CN21	CN4	PRESSED				OT5	OT1	TONGUE
CN22	CN5	DOWN				OT6	N/A	TONGUE
CN23	CN6	PRESSED				OT7TL	OL1,OT8	TONGUE
						OT7TM	OL2,OT8	TONGUE
CP1	CN1	PUFF				OT7TR	OL3,OT8	TONGUE
CP2	CP1	PUFF				OT7BL	OL4,OT9	TONGUE
CP3	CP3,4,5	PUFF				OT7BM	OL4,OT9	TONGUE
CP4	CP2	PUFF				OT7BR	OL4,OT9	TONGUE
CP5	N/A	TRILL				OT7WL	OL5,OT10	TONGUE
CP6	CP7	PUFF/TRILL				OT7WM	OL5,OT10	TONGUE
CP7	CP6	PUFF/ TRILL/ BLOW				OT7WR	OL5,OT10	TONGUE
CP8	CP8	PUFF/ BLOW				OT8	OT1	TONGUE
						OT9	N/A	TONGUE

The above codes can be 'translated' into more descriptive glosses (Table 12):

Table 12 Mouth gesture form codes and glosses used for typical exemplars

BLOW air moves inwards or outwards through the lips which may be pursed or rounded CN8, CN17, ON16-18	**BOTTOM-LIP-OUT** bottom lip is pushed forward, out or up CN3, CN20, ON11, ON14	**DOWN** the corners of the mouth are pulled down, mouth can be open or closed, lips can be pressed together, tense or relaxed CN4, CN22, ON4, ON9, ON15
LIP-CURL top lip is pulled up on one or both sides, as in a sneer CN1, ON5, ON10	**LIPS-OUT** lips pushed forward, as in a pout or "shh" CN11-14, CN16, ON16	**LIPS-PRESSED ('MM')** lips are pressed together but the mouth corners are relaxed CN5, CN6, CN21, CN23,
OPEN mouth is open ON1-3	**PUFF** puffed cheeks CP1-8	**SLIGHTLY-OPEN** mouth is slightly open ON6, ON12
SUCKED-IN cheeks are sucked inwards CN24	**TONGUE ('TH')** tongue pokes out or is visibly forward all OT codes & CN19	**TRILL ('BRRR')** lips vibrate CN7, CN9-10, CN13-15, CN18, CP5,
WIDE ('EE') corners of mouth are pulled wide, mouth can be open or closed,lips can be pressed together, tense or relaxed CN2, ON7, ON8, ON13, ON14		

A note on enactment of expressions and actions: Non-manual features are closely related to behaviours found during periods of CA and CD—periods of time during which the signer engages in what has often been referred to as 'role play' (or 'role shift') in the sign linguistics literature, especially in sign language teaching materials. These are both manual and non-manual in character but usually related to units larger than individual signs. It will be discussed after we introduce the treatment and annotation of multi-sign units.

2.2.2   Annotation of units larger than individual signs

Free translation and segmentation of the text into individual signed tokens is the most fundamental level of transformation required to make the raw data tractable. Of course, linguistic analysis of a corpus needs to take into account the utterance units in which language is packaged and messages exchanged, not just the individual signs. Utterance units usually contain more than one sign and are delineated or held together by their manner of delivery (as articulatory units), by their meaning (as coherent units), and by their linguistic structure (as constructional schemas). If they are not just interjectory fragments, basic utterance units are usually considered to be linguistic constructions of the type 'clause'. One possible very general definition of a clause is a meaningful symbolic utterance unit that asserts something about the world by using one element in that utterance to predicate something about another element. The predicating element is a verb or predicating adjectival element.

These utterance units are often thought of as being only propositions (information units) but linguists have long recognized that utterance units also simultaneously perform two other functions: (i) regulating interaction or relationships between the interlocutors; and (ii) managing or structuring the message output itself (Harman 1971; Halliday 1985). Because the elements of a multi-sign unit cannot all be uttered at the same time the units themselves form larger chains or sequences that need to be related to each other, i.e., the temporal unfolding of the message stream has itself to be managed.

A note on *clause* and *sentence*. The basic propositional and utterance unit of language is called the *clause*, especially when describing the morpho-syntax of a language. A *clause* is centred on a verb which denotes an event, state or relation which involves one or more participants (or arguments). When the proposition or utterance consists only of a single clause these units are also often called *sentences* (or *simple sentences*) by linguists and language specialists. However, propositions and utterance units are often not just simple single clauses—they can consist of two or more clauses and are called *composite clauses* or *complex sentences* (to distinguish them from *simple sentences*). *Composite clauses* (or *complex sentences*) include *complex clauses* (in which one clause is embedded in another), or *clause complexes* (in which two or more clauses are overtly joined into a larger unit). In *complex clauses (*or *complex sentences*), the embedded clause is part of a larger clause which called the *matrix clause* (or *matrix sentence*).

We use these utterance units to tell someone something in an act of communication. One 'tells' someone something by encoding it though the lexico-grammatical constructional schemas of one's language (i.e., in clauses exploiting lexis and morph-syntax as traditionally understood). However, it will be apparent to anyone who has ever tried to segment a stretch of naturalistic Auslan into utterance or propositional units that 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 usually referred to in the SL literature as 'constructed action'. As a consequence, some utterance units may be acts of telling while others are actually acts of showing, not telling in a narrow linguistic sense. Many of these showing units may have equal status as chunks of meaning as those units which are more easily identifiable as clauses. Indeed, it appears that many utterance units display a complex combination of both telling and showing.

In this annotation schema, the basic articulatory chunks of propositional meaning in the corpus are called *clause-like units* (CLUs) rather than *clauses* in recognition of the dual 'tell' or 'show' strategy approach apparently exploited by Auslan signers. The name makes the provisional nature of the unit absolutely clear—any CLU could be a 'telling' instance or a 'showing' instance, or a mixture of both. Both types seem to be concatenated or woven together into a seamless meaningful stream in the language. A major task of SL linguistics is to investigate and describe this phenomenon further.

One of the main reasons of annotating units larger than individual signs is thus to identify potential utterance units so that systematic and comparative analysis of them can begin, discriminating between acts of telling and showing, and identifying the constructional schemas instantiated therein.

The analysis of telling is based on the utterance unit as a clause and investigates the lexico-grammar as manifested in phenomena like word or sign order and patterns (or paradigms) of changes to word or sign morphology. It explains these as a function of, or realisation of, grammatical relations such as subject and object, on the one hand, or semantic, pragmatic and discourse factors, on the other. The typical number of arguments that occur with various verb types in clauses, and the way in which clauses are linked or joined together in the language to form clause complexes are also the focus of this type of grammatical analysis.

Traditionally, grammar analyses telling only, but there are good reasons why showing should also partly be included in the grammatical analysis. Section 2.2.2.2 will explain how argument roles of CA can be annotated on a par with grammatical roles of lexical and other signs. Thus, while CLU annotations do delimit *potential* clauses in the text, the CLU annotation is not a claim that the identified meaningful unit is, in fact, a traditional grammatical construction of the type 'clause'.[24]

2.2.2.1 Clause identification annotation on the CLU tier

The CLU tier and its child tiers are intended to assist in the process of identification, description and analysis of clause structure, where applicable (i.e., an act of telling), and to facilitate the comparison of clauses thus identified with other types of meaningful 'non-linguistic' (showing) utterance units in Auslan.

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[24] We will use both the terms *CLU* and *clause* depending on the context as appropriate throughout the remainder of these guidelines, but this important caveat should always be kept in mind.

Given that the structure of Auslan above the level of the individual sign is not well understood, the additional annotation undertaken at this primary processing stage is necessarily general, tentative and exploratory, relying heavily on meaning and form in the delineation and delimitation of units. Form at the level of utterance unit means features of production or delivery that relate to non-manual prosody—facial and other non-manual expressions like head movements, speed of articulation, body shifts, pauses and so on.

Our approach is thus once again 'circular' in what we believe to be in the positive and empirical sense discussed in Section 2 and illustrated in Figure 1, i.e., the whole annotation procedure involves repeated deductive and inductive phases. Of course, some annotations are more form/structure based and some are more meaning/function based but both form and meaning must be in every act of annotation, cf. Consten & Loll (2012). *No claim is being made that any of these CLU annotations—or any other annotations used in the Auslan Corpus—are somehow objective theory-neutral labels attached to the raw data.*

The duration of each CLU in the video data is identified with a file label and sequence number which is semi-automatically generated in ELAN (Menu > Tier > Label and number annotations), as in the following example:

(59)

The constituent signs of each CLU are later tagged on daughter tiers as a part of secondary processing in order to identify, describe and analyse clause structure, where applicable, i.e., as acts of 'telling'. Example (59) uses three lexical signs RABBIT ALWAYS and SPRINT. The CLU can be compared to other types of meaningful utterance units in Auslan that may be acts of 'showing', as in example (60) in which the signer shrugs their shoulders to show what the villagers did, i.e., the villagers shrugged their shoulders:

(60)

In example (61) there is a combination of telling (the fully lexical signs OVERNIGHT SAME and AGAIN), showing (the herding gesture), and showing-and-telling (the partly-lexical depicting sign for a group of things moving).

(61)

	00:00:26.000	00:00:26.500	00:00:27.000	00:00:27.500	00:00:28.000	00:00:28.500
ClauseLikeUnit(CLU)	BGMQB1c2aCLU#07					
Mouthing		SAME	AGAIN			
MouthGestF				BRR	BRR	
RH-IDgloss	OVERNIGHT	SAME	AGAIN	G(CA):HERDING-WITH-ARMS	DSM(5-HORI):ANIMALS-MOVE	
LH-IDgloss	OVERNIGHT	SAME		G(CA):HERDING-WITH-ARMS	DSM(5-HORI):ANIMALS-MOVE	
CA				CA:BOY		
LitTransl	next-day same again boy-herds-sheep they-all-go-up-hill					

2.2.2.2 The annotation of constructed action & constructed dialogue

The non-manual features discussed above are closely related to behaviour found during periods of time in which the signer engages in what has often been referred to as 'role play' in the general sign linguistics literature (and especially in the sign language teaching literature).

Recall from section 2.2.1.1 that body movements and shifts (sometimes called 'role shifts'), which are annotated on the body tier, simply exploit (or set up) an association between what is being signed and a location towards which the body is moved or shifted. The association may be with a discourse participant (a 'character') located or deemed to be located at that location, but in itself this association need not also entail any *enactment* of the actions or utterances of the associated referent, as already seen in example (58). By way of contrast, enactment is what we are concerned with here now. The use of enactment in SL discourse is referred to as constructed action, or CA.

2.2.2.2.1 Constructed action

Enactment of the external physical actions or behaviour of a character is the essence of *CA* (including the narrator's own). In the literature, CA refers to the use of shifted expressive elements and gestures that imitate the actions of someone other than the signer at the time of signing, i.e., it can also be the signer, but at another time and place. The term *constructed action* was introduced in the sign linguistics literature by (Winston 1991) because it refers to actions that are not just a direct imitation of the character's actions, but are actually a selective re-enactment, i.e., they are the signer's 're-construction' of another's actions.

During a period of CA the signer is 'copying' or 'quoting' actions or expressions. This is manifested in facial expressions, movements of the head and body, and/or actions of the hands and arms which are not part of the established Auslan vocabulary of lexical signs or depicting signs.[25] As mentioned above (2.1.2.3.1), many gestures are often actually instances of 'constructed actions': during such periods the signer is actually performing some action of a character in a role. For example, while producing a manual sign, such as SEARCH, a signer may squint and move his or her head from side to side to show the actions of a person looking for something; or, instead of producing the conventional sign WINK, a signer may choose to actually wink in order to show that a character winks.

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[25] The boundary between some types of depicting signs, such as handling depicting signs (i.e., so-called 'handling classifiers'), and CA is difficult to draw.

Once the period of CA has been identified, an annotation field prefixed with CA is created on the CA tier. This is followed, after a colon, by the name of the person or entity whose real or imagined behaviour is being enacted, e.g.

(62)
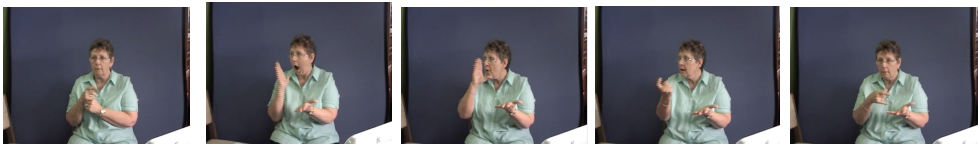
ClauseLikeUnit(CLU) [92]	SSN_c7a_S_M_30_N_CLU#64		
RH-IDgloss [280]	G(CA):HUMAN-HOLDS-SOMETHING	SOLID	DSS(4):MANY-THIN-OBJECTS-EXTEND
LH-IDgloss [169]	G(CA):HUMAN-HOLDS-SOMETHING		DSS(4):MANY-THIN-OBJECTS-EXTEND
CA [45]	[CA:BOY]		
LitTransl [92]	[boy] hold solid multiple-thin-upright-things		

In example (62) the CLU has three signs. The first co-occurs with a period of CA (indeed, CA is all of the activity during the first articulation event). It is followed by a single lexical sign (SOLID) and a partly-conventional depicting sign (DSS(4):MANY-THIN-OBJECT-EXTENDED).

A period of CA may occur in a CLU (i) at the same time as the articulation of manual signs of different types. In example (63), for instance, the CA spreads across several signs. Three of these are lexical signs (REAL, WOLF, COME) while the other two (the first and last manual articulations) are actually gestural enactments of the stance of the boy while he looks in surprise, i.e., the manual and non-manual components of the articulation at these intervals are parts of the CA.

(63)

ClauseLikeUnit(CLU) [58]	SSSc2a_S_F_60_N_CLU#40				
RH-IDgloss [150]	G(CA):LOOK	REAL	WOLF	COME	G(CA):LOOK
LH-IDgloss [78]		REAL			
CA [43]	CA:BOY				
LitTransl [57]	really wolf come (to the boy's shock and surprise)				

In example (64), the CA co-occurs with a single manual lexical sign (LOOK) in a very brief CLU.
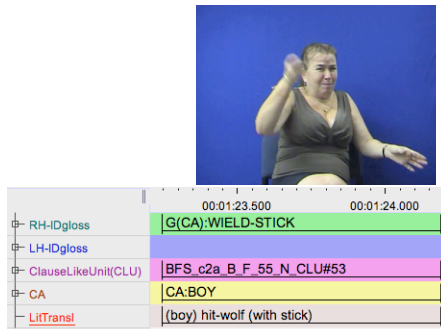
(64)

ClauseLikeUnit(CLU)	AAPc7a_A_F_51_N_CLU#112	
RH-IDgloss	IE	LOOK
LH-IDgloss		LOOK
CA		CA:BOY
LitTransl		[boy] look-down-at (frogs)

CA may be used instead of using any conventional or partly conventional signs at all as in example (65) where the entire, brief, CLU is an instance of CA with no conventional sign, i.e., the whole unit is a gestural enactment.

(65)
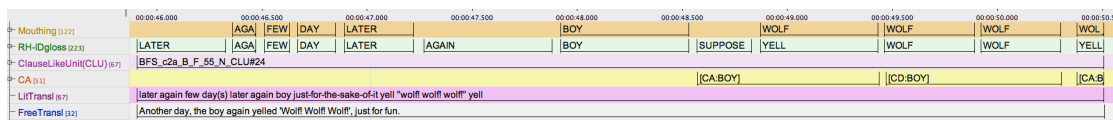
	00:01:23.500	00:01:24.000
RH-IDgloss	G(CA):WIELD-STICK	
LH-IDgloss		
ClauseLikeUnit(CLU)	BFS_c2a_B_F_55_N_CLU#53	
CA	CA:BOY	
LitTransl	(boy) hit-wolf (with stick)	

2.2.2.2.2 Constructed dialogue

Enactment of the external physical actions or behaviour of the character may actually present that character's *utterance* (in speech or sign). It is referred to here as *constructed dialogue* following Tannen (1986) and Roy (1989). The action one copies or quotes are those involved in someone else uttering something. It is a type of direct quotation and is very similar to the (supposedly exact) repetition of the words that someone utters, which may also include attempts at recreating the voice quality, intonation, volume and stress of the original, e.g. *He said "Soooo… WHO do you think YOU are?!"* rather than *He asked me who did I think I was* (which is a form of indirect speech). What speakers and signers are doing in CD is re-enacting the utterance, even if it is never exact. It is 'constructed'.

The most straight forward instances of CD identify the speaker, use a verb naming an act of saying or thinking (e.g., SAY, TELL, YELL, THINK, IMAGINE) and then quote the utterance or thought:
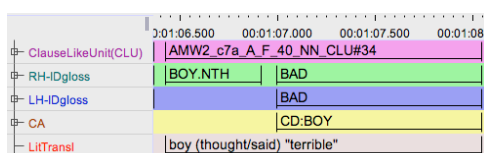
(66)

Often there is no verb of saying or thinking at all. The speaker or thinker is identified and this is immediately juxtaposed to the utterance or thought:

(67)

	0:01:06.500	00:01:07.000	00:01:07.500	00:01:08.
ClauseLikeUnit(CLU)	AMW2_c7a_A_F_40_NN_CLU#34			
RH-IDgloss	BOY.NTH	BAD		
LH-IDgloss		BAD		
CA		CD:BOY		
LitTransl	boy (thought/said) "terrible"			

In other cases, the speaker or thinker is omitted (assumed from context) with only a verb of saying or thinking introducing the utterance:

(68)

	00:00:54.000	00:00:54.500	00:00:55.000	00:00:55.500	00:00:56.000
RH-IDgloss [222]	SCREAM-2H	WOLF		WOLF	
CA [2]		[CD:BOY]			
ClauseLikeUnit(CLU) [14]	PDR_c2a_P_M_42_N_CLU#07				
RH-Arg [22]	V1	A		A	
RH-MacroR [9]	PROCESS	UNDERGOER		UNDERGOER	
RH-SemR [9]	ACTION	UTTERANCE		UTTERANCE	
LitTransl [14]	(the boy) yelled-out wolf, wolf				

Finally, the utterance may simply be performed with no overt manual marking of the who the speaker or thinker is or any specification of the type of utterance action it instantiates (thinking, imagining, saying, yelling, etc.):

(69)

	00:01:20.000
ClauseLikeUnit(CLU) [68]	BFS_c2a_B_F_55_N_CLU#49
RH-IDgloss [223]	REAL
LH-IDgloss [116]	REAL
CA [51]	[CD:BOY]
LitTransl [68]	(boy think/say) "(it's) true!"

The examples given above illustrate simple one or two word utterances which are not, in themselves, separate CLUs, i.e., the utterances are not embedded clauses. These types of CDs are described below in section §3.2.2.5 which deals with the annotation of relationships between clauses (and see also example (45) above).

2.2.2.2.3 Metaphorical or anthropomorphized CA/CD

The entity one mimics (or 'constructs') does not have to be human: it can be an animal, an object, or even something quite abstract. In other words, it is possible for Auslan signers to anthropomorphize non-human and abstract entities. This is contrary to what has been reported in the literature for some other SLs. Consider the following example:[26]

(70)

Head		RAPID-LITTLE-SHAKES		
Face		STARTLED-AND-WORRIED		
CA		CA:EGG		
ID-gloss	FS:EGGS	BOIL	BETTER	DSH(BENT7):TURN-DOWN

LitTransl *Eggs (are) agitated, startled (and) worried (that they'll break). (You'd) better turn-down (stove).*
FreeTransl *The eggs are boiling too vigorously so you should turn the stove down.*

One imagines the object or entity to be alive and the actions and expressions are assumed to be that of the 'animated' object. Thus, in addition to characters who actually can use speech or signs, signers may attribute to objects emotions and thoughts expressed through signed utterances, or represent ideas though an imagined dialogue between non-human abstract entities.

2.2.2.3 Body partitioning

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[26] I have to thank my mother for spontaneously producing this example at breakfast one day.

Body partitioning refers to the situation in which the body of the signer—meaning the head, gaze, face (eye aperture and brows, mouthings and mouth gestures) and torso—are associated with one referent while the manual signs themselves are associated of another (cf Dudis 2004). One of the most common environments in which this occurs is where the signs being articulated are depicting or indicating signs describing a scene, while body behaviours such as facial expressions are of an observer of this scene, or one of the participants (characters) therein. Note that the boiling egg example (70) is also an example of body partitioning—the signer's expressions have become those of an anthropomorphised, somewhat flustered egg in boiling water. Annotating body partitioning in examples can be managed using the conventions already described, as in example (70) above or (71) following:

(71)

	00:00:18.000	00:00:18.500	00:00:19.000	00:00:19.500	00:00:20.000	0
Face [1]					surprised	
Mouthing [5]		FROG	GONE	JAR	GONE	
ClauseLikeUnit(CLU) [100]	PTK7a_F_A_37_N_CLU#10					
RH-IDgloss [227]	GO-2H(	FS:JAR(FS:JA)(FALSE-ST	FROG	GO(5)-2H	FS:JAR	GO
LH-IDgloss [116]	GO-2H(	FS:JAR(FS:JA)(FALSE-ST		GO(5)-2H	FS:JAR	DSS(BENT5):OBJECT-SPHER
CA [49]						CA:BOY-LOOK-SURPISED/
LitTransl [55]	go.. jar.. frog gone jar, gone [he-is-surprised-to-see]					

The facial expression in example (71) is unambiguously associated with the boy (who has lost the frog). The CA therefore prompts a (slightly) different meaning simultaneously to the meaning of the signed elements. This additional meaning has been inserted in square brackets on the literal translation tier.

One can imagine complex scenarios in which it may be problematic to unambiguously assign non-manual behaviour to a specific character. It is evident that a detailed analysis of body partitioning using corpus data may reveal a need to refine annotation conventions in this regard. Indeed, there may be some unresolved issues regarding the nature of body partitioning. For example, 'body partitioning' of one kind or degree or another may be a constant presence in most signing because in the sense that a signer is always able to 'modify' or 'comment' on signs they are producing using non-manual elements or facial expression. In other words, body partitioning may be central to what is normally described and analysed as non-manual adverbial modification.

3 Secondary processing

Secondary processing entails adding to the annotations already created in primary processing (sign tokens or CLU tokens). It involves the sub-categorization of constructions of various sizes (from individual signs to phrases, clauses, or complex sentences) and the identification of their constituents. Secondary processing thus adds phonological, morphological, semantic, syntactic, pragmatic and discourse information about linguistic forms, depending on the purpose of the analysis. Some tiers use controlled vocabularies.

3.1 Sign-related tagging (tagging sign tokens)

Sign token tagging covers linguistically relevant information such as the specification of phonetic and phonological form, the degree of match of the token to the citation form, the disambiguation of the meaning of a specific sign token in a given context, the assignment of grammatical class membership, and so on.

3.1.1 Form tagging

With respect to sign form, the ID-glosses can be augmented with broad or narrow phonetic or phonological annotations on the transcription tiers.

3.1.1.1 The transcription tier and its daughter tiers

The coding of phonetic or phonological form may be done as one complete string on the transcription tier or on the multiple child tiers, where each significant aspect of phonetic or phonological form, such as handshape, orientation, movement, etc. can be transcribed independently (Table 13).

Table 13 Tiers that tag the RH ID-gloss tier

Parent tier ↳ Child tier	Expanded name	Linguistic type
RH ID-gloss	Gloss	BasicAnnotation
↳ RH-Mean	Meaning	BasicTag
↳ RH-GramCls	Grammatical class	GramCls
↳ RH-Transcrip	Transcription	BasicTag
↳ RH-Handsh	Handshape	BasicTag
↳ RH-Orient	Orientation	BasicTag
↳ RH-Loc	Location	BasicTag
↳ RH-Move	Movement	BasicTag
↳ RH-NonMan	Other non-manuals	BasicTag
↳ RH-OtherPhon	Other phonetic/phonological	BasicTag
↳ RH-ModOrVar	Citation modification or variation	ModOrVar
↳ RH-Freq	Lexical frequency	BasicTag
↳ RH-CAco	Co-occurrence of sign with CA	BasicTag

Transcriptions may or may not use a dedicated notation system, such as HamNoSys, which can be displayed in the ELAN file, as in:

(72)

ClauseLikeUn	MFK_c4a_M_F_55_N_CLU#12	
RH-IDgloss	PT:PRO1SG	REMEMBER
RH-Transcrip	⌐↓↕◊⊟ˣ	◔⋏◊⊓◻≻◠⁺
LitTransl[145]	i remember	

At present, the phonological features specified on the other tiers (e.g. handshape, orientation, etc.) are based on a flat parameter model of sign structure. If more sophisticated phonological studies of Auslan were to be use the Auslan Corpus, more specific phonological tiers would need to be added to could carry detailed phonological annotations.

The *NonMan* child tier of the parent *transcription* tier is for non-manual features that are specific to the particular sign and are not elsewhere coded. The *OtherPhon* child tier of the parent *transcription* tier contains sign-specific phonological features (i.e., not prosodic features that commonly spread over more than one sign) that are not easily accommodated on other tiers.

A note on sign duration: It is important to stress that the basic annotation using ID-glosses is primarily concerned with identifying symbolic units in the discourse. Temporal alignment between articulators is very much based on meaning and apparent intention to communicate. It bears repeating that when exact temporal phenomena are the very subject of investigation it will need to be made explicit in the annotations. Annotation data of this type can be added to an existing file by duplicating the ID-gloss tiers, renaming them as, say, 'phonetic duration tiers' and adjusting the duration of annotation fields accordingly. It is relatively simple to 'reuse' or 'enhance' basic annotations in this way for this phonetic and for other purposes. However, it appears more difficult to do the reverse, i.e., use phonetic transcriptions for other purposes.

3.1.1.1.1 The orientation tiers

To date, only tags for the palm orientation of pointing signs have been made on this tier. The tags that were used for non-possessive points are: d = down, s = sideways, u = up, o = other (e.g. when it can't be seen for whatever reason), z = not applicable, e.g., when pointing to oneself in first person points (PT:PRO1SG). For possessive points that point with the palm side of the hand, only two tags were used: t = target (palm is directed towards the target) or o = other (palm is not directed towards the target).

3.1.1.2 The citation modification or variation tier

ID-glosses simply identify the sign type and thus treat lexical signs as if they appeared in citation form. Of course, signs rarely appear in citation form because they are usually produced in utterances consisting of more than one sign. These other signs have an impact on the beginning and end states of each individual sign in terms of handshape, location, orientation, and direction. Signs may also deviate from their citation form because they have been deliberately and systematically modified—in conventionalized ways—to convey various

types of meaning. The *citation modification or variation* tier (abbreviated to *ModOrVar* tier) is used to tag a sign as unmodified (citation) or modified ("inflected") in this second sense.

One should also not forget that the token form of a sign type may also be influenced by each individual signer's pronunciation or signing style.

In the annotation files currently in the corpus, the *ModOrVar* tier has only been used to code for sign modification that involve spatial changes. If modified in this way, the type of the modification is specified in tags that makes a three-way distinction with respect to type of spatial modification (Table 14).

Table 14 An example of tagging used for modification in some annotation files

Tier tag		Expanded	Explanation
m	m	modified	The sign is modified spatially.
n		not modified	The sign is not spatially modified, and is in its citation form.
	n	not modified, not congruent	The sign is not spatially modified, and in its citation form. It is not congruent with the spatial framework. If it had been modified it would/should have looked different to the citation form.
	n/a	Not-applicable because body-anchored	The sign is not spatially modified nor can it be because it is a body-anchored sign.
	cg	not modified, but congruent	The sign is not spatially modified, and is in its citation form. It is, however, congruent with the established spatial arrangement. If it had actually been modified, it would/should still look like the citation form (if modification really was present, it would be invisible).

The actual form of the modification can be coded separately on one of the relevant transcription tiers, e.g., 'other phonological', but this has not been done to date.

3.1.2 Semantic tagging

3.1.2.1 The meaning tier

Recall from 2.1.2.1.1 that this tier for recording the meaning of a sign when the sign is not listed in the lexical database, or a meaning of a which is listed in the database but without the newly added meaning as one of its keywords.

3.1.2.2 The grammatical class tier

This tier is used to categorise signs very broadly into grammatical classes (aka 'word classes' or 'parts of speech'). However, rather than definitively identify a sign in a given context as a sign of a particular grammatical class, the grammatical class tagging is intended to help explain the assumed structure of a phrase, clause or complex sentence because this is not always obvious from the IDgloss. IDglosses are based on English words. In English word classes are often indicated in the form of the word, but this is usually not the case for Auslan signs so the grammatical class label is used to clarify the role each sign is assumed to be playing in the text.

Overall, the grammatical class categories are tentative because the very determination of grammatical class is itself the product of linguistic analysis. In practice, assigning grammatical class categories to individual signs cannot be done independently of context (meaning) and co-text (the clause in which it occurs). Given that a string of signs (a phrase,

clause, or complex sentence) may be parsed by different researchers in slightly different ways, more than one grammatical class categorization of one or more signs from the same string could be made by different researchers. Determining grammatical class is thus not a simple or straightforward procedure. Not only is the grammatical class of some kinds of signs, like pointing and depicting signs, still open to question, the range and type of grammatical sign classes found in Auslan have yet to be determined. This is also true of all other SLs (Schwager & Zeshan 2008).

Establishing empirically the type and number of grammatical classes in Auslan and the way this is manifested in the morphosyntax of the language is actually one of the central reasons for the creation of the Auslan Corpus: to make accountable and empirically ground the linguistic analyses that are proposed.

Table 15 The Controlled Vocabulary (CV) for grammatical class tags

CV tag	Expanded	Description
Signs that name, identify or show entities		
NorV	Noun or Verb	A sign which could be analysed as either a noun or a verb but there is not enough evidence to decide either way.
NP	Noun: Plain	A noun sign which cannot be re-located in space. These nouns are usually also body anchored.
NLoc	Noun: Locatable	A noun sign that can be re-located in space, but probably cannot be moved through space.
ND	Noun: Depicting	A partly lexical sign that denotes or describes an entity or participant.
Pro	Pronoun	Points to referent or to establish a referent.
Loc	Locative	Points to a location or to establish a location.
Signs that name or show processes		
NorV	Noun or Verb	A sign which could be analysed as either a noun or a verb but there is not enough evidence to decide either way.
VP	Verb: Plain	A verb sign which cannot be physically moved about in space. These verbs are usually body anchored.
VD	Verb: Depicting	A partly lexical sign that denotes or describes a process, activity or relationship.
VIDir	Verb: Indicating Directional	A verb sign that can change its start and end positions in the signing space. It can be moved meaningfully through space (this usually means can also be located). This also implies location modification.
VILoc	Verb: Indicating Locatable	A verb sign that can change its location in the signing space. Tends to be used for signs that cannot also change direction.
Signs that modify entities or processes		
Adj	Adjective	Modifies a noun.
Adv	Adverb	Modifies a verb or an entire clause or complex sentence.
Aux	Auxiliary	Co-occurs with a main verb, and expands its meaning in some way.
Num	Number	A sign for a number, used to describe quantities (esp. times and dates)
Det	Determiner	A sign that usually co-occurs with its referent signed explicitly before, after or simultaneously with the point. The signer is marking that the referent is known or specific in some sense (e.g., like 'the' in English).
Loc	Locative	Points to a location or to establish a location.
Signs that link signs, phrases or clauses		
Conj	Conjunction	Joins other signs or sign phrases or clauses.
Prep	Preposition	Grammatical words that fulfil a wide range of functions (esp. linked to meanings associated with direction and location). Essentially they are equated with English prepositions.
Buoy	Buoy	A handshape held up to represent/mark a referent that is being mentioned.

CV tag	Expanded	Description
WH-Rel	Relative pronoun	A question sign used in a non-interrogative function, such as a relative pronoun to introduce a complement phrase.
Signs that have other functions		
Neg	Negator	Negates another sign (usually a verb). Normally considered a type of auxiliary but since there is no copula in Auslan it could be used to negate an adjective.
WH-ProQ	Wh- Pronoun Question sign	A pronoun question sign such as WHO, WHAT, WHERE, WHEN, HOW-MUCH, WHAT-AGE, etc.
Interact	Interactive	An expression of emotion or attitude and usually appears on its own, appears not to enter into any structural/syntactic relationship with any other surrounding elements (i.e., not part of a grammatical sequence of other signs).
DM	Discourse marker	Marks stages or transitions in a text.
Fragment	Fragment	A unit that appears not to enter into any structural/syntactic relationship with any other surrounding elements (i.e., not part of a grammatical sequence of other signs).
Salutation	Salutation	Conventional sign or signs used in greeting or leave taking.
Title	Title	Precedes the name of a person, showing their social role or status.
Unsure	Unsure	Used to show an attempt has been made at categorization but no decision was arrived at.

In ELAN, CVs can be overridden so it is possible to add new category label if nothing appears appropriate. Any new class label can be revisited on a subsequent annotation pass for re-assessment.

3.2 Clause-related annotation and tagging

Once delineated, CLUs can be analysed and annotated in relation to their internal structure (clause constituent level annotation) or in relation to the CLU as a whole (clause unit level annotation). The relevant tiers being currently used in these types of annotations are listed in Table 16.

Table 16 The ClauseLikeUnit(CLU) tier and related tiers

Parent tier ↳ Child tier	Expanded name	Linguistic type
CLUcomplex	CLUs overtly related to each other	BasicAnnotation
↳ OvertDependencyType	Nature of expression of dependency	BasicTag
CLUwithinCLU	Complement and embedded CLUs	BasicAnnotation
↳ OvertEmbeddedType	Nature of expression of embeddedness	BasicTag
CLUcomposite	Simple or complex clauses, or clause complexes	BasicAnnotation
ClauseLikeUnit(CLU)	**Clause-like unit ('utterance/meaning unit')**	**BasicAnnotation**
↳ RH-Arg	Argument identification	ClauseArguments
↳ RH-MacroR	Macro-role of argument	MacroRoles
↳ RH-SemR	Semantic role of argument	SemanticRoles
↳ RH-overtSUBJ?	Overt subject?	overtSUBJ?
↳ LH-Arg	Argument identification	Arguments
↳ LH-MacroR	Macro-role of argument	MacroRoles
↳ LH-SemR	Semantic role of argument	SemanticRoles
↳ LH-overtSUBJ?	Overt subject?	overtSUBJ?
CA	Constructed action or constructed dialogue	BasicAnnotation
↳ CA-Arg	Argument identification	ClauseArguments
↳ CA-MacroR	Macro-role of argument	MacroRoles
↳ CA-SemR	Semantic role of argument	SemanticRoles
↳ CA-overtSUBJ?	Overt subject?	overtSUBJ?

3.2.1 Clause constituent level annotation and tagging

As explained in §2.2.2, CLUs are coherent stand-alone utterance units identified, in the first instance, on the basis of both form and meaning.

A clause is made up of constituent signs or words some of which form part of the core of the clause, and some which are peripheral. The core of the clause consists of the predicate (verb/s that denote processes or relations) and the argument/s (nominal/s or nominal phrase(s) that denote participants in state of affairs described therein). Other elements of the clause, such as discourse markers, fixed expressions, some gestures and lexical and phrasal adverbials (of time, location, manner, etc.), convey circumstantial information that qualifies in some way the basic state of affairs. These peripheral elements are regarded as adjuncts to the clause and are tagged as non-arguments. Alternatively, some may be given independent CLU status but tagged as 'fragments' on the CLUcomposite tier (see 3.2.2.6). The fragment status quarantines them from being counted as grammatical constructions.

A *clause constituent* is an 'overt' sign unit that names or identifies a participant, process or relation in the state of affairs expressed in the CLU. They include all types of manual signs, as well as enactments (CAs) or gestures, so they are not just lexical or partly-lexical manual signs. Clause constituents may also be expressed as non-manual signs: for example, as mouthings which name a participant or process not explicitly identified in a co-occurring depicting sign; mouthings with no co-occurring manual sign; enactments with identify a participant or process not expressed in a co-occurring manual sign; or enactments that occur with no co-occurring manual sign. These are also annotated, as described below.

Indicating verbs show or indicate arguments by directional or spatial modifications of the verb. We do not consider these modified components of indicating verbs to be themselves arguments that are expressed or coded in inflectional morphology (the inflection being the change of beginning and end locations).[27] Irrespective of the modifications being grammatical inflections or gesture-related pointing actions, we consider them to be 'covert' so they are not annotated as constituents in this schema. The indicating verb itself is, of course, still a constituent of the CLU.[28]

An account of the order of overt arguments and the macro-roles and semantic roles they instantiate is required before any CLU can be confidently claimed to be a token of a language-general or language-specific construction of the type 'clause' or indeed of any other type of propositional or grammatical unit one may wish to propose, e.g., one which may exploit other representational strategies that may or may not be unique to SLs.

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[27] The differential treatment of 'inflection' is partly due to on-going research about the nature and role of these types of sign modifications in Auslan. Early research by de Beuzeville et al. (2009) has suggested that these sign modifications are not as systematic nor consistent as once thought and thus do not truly encode argument roles.
[28] The presence or absence of this type of verb modification is coded on other dedicated tiers, e.g., the modification or variant tier.

It should be noted that arguments of a verb may simply be unstated. They are inferred from the linguistic context or context utterance. Inferences tend to be revealed, as a matter of course, in the free translation.

3.2.1.1 Clause arguments & constituents

By identifying the main predicating constituent (the verb or verbs) and the major discrete separate manual and non-manual units that act as arguments of the verb in its clausal context, we are able to determine their type, number and order of occurrence of arguments in different types of clauses. Clausal constructional schemas for Auslan can then be proposed based on the repeated associations of the number and position of overt arguments in particular macro-roles and semantic roles, correlated with clause semantics (Aktzionart) and process transitivity type (see §3.2.2). Particular alignments of semantic roles, argument position, verb morphology, and the interpretation of elided arguments across clauses can then be used to argue for or against the presence of grammatical (syntactic) relations, such as Subject, in the language.

3.2.1.1.1 The Argument tier

The identifiable overt signs, most of which are manual, are annotated on the clause arguments tiers (RH-Arg etc.).[29] An argument is labelled as *A* (or is numbered if there is more than one), a verb is labelled as *V* (or numbered if there is more than one), and non-arguments are labelled *nonA*:

(73)

From the above example, one can see that only the head of what may be considered nominal or verbal phrases has been identified in argument tagging at this time. Other modifying or specifying constituents of the clause (determiners, adjectives, numbers, quantifiers that co-occur with nominals, or adverbials that co-occur with verbs) are simply tagged as 'nonarguments' (nonA).

In the following example, while ALL PEOPLE could be analysed as a nominal phrase, the annotation schema we have used does not yet attempt to do this. Similarly, REPEAT is an adverb that either modifies the entire clause (a sentence adverbial) or is part of a

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[29] The clause arguments tier is a daughter of the independent CLU tier. When assigning argument tags to sign glosses that fall in the domain of a clause annotation, select the sign gloss then insert a new annotation on the clause arguments tier by clicking within that selected time interval. By doing this the annotation on the clause arguments tier will be fully aligned with the gloss annotation field on the IDgloss tier. This happens automatically if the gloss is selected first before double clicking directly under it at the clause annotation tier level.

discontinuous verb phrase (REPEAT … JOKE). The current tagging on the clause arguments tier in the Auslan Corpus is thus not suitable for an analysis of the internal structure of nominal phrases or verbal phrases, except for determiners that are pointing signs because their ID-glossing reveals their grammatical class (PT:DET).[30]

(74)

In (74) one will also notice that there is no independent, or independent and simultaneous, weak hand activity in the CLU. Consequently, there is no argument annotation on the left hand tiers. If this was the case, as in CLU#73 in (75), it would be annotated:

(75)

Notice that the left (weak) hand argument annotations are enclosed in curly brackets. This enables them to be easily distinguished from the right (strong) hand argument annotations if annotations are exported into a spread sheet program or the annotations merged during tertiary processing (see §4.1.1).

Notice also the same argument occurs several times in this example (once as a simple repetition PT:PRO3PL, and once as a nominal specification PEOPLE). A second occurrence of an argument like these, is not coded as a new argument (A2, A3, etc. as the case may be), but receives the same tag as the first instance because the tag A2 implies there is another second different argument (A1), with a different role, in the same clause.

The argument tier annotations for an overt argument which is only expressed through constructed action (often through body partioning, see 2.2.2.3 above) are enclosed in square brackets. This allows searches of argument patterns to distinguish those that consist of overt manual signs only from those that consist of overt constructed action only or, indeed, those that consist of a mixture of both.

The CVs used on the arguments tiers are summarized in Table 17.

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[30] Phrase level annotation is not described in these guidelines because it is not the focus of any current Auslan Corpus annotation, but it will be addressed in subsequent updates.

Table 17 The CV for the Argument tier

Arg-tier tags			Explanation
RH	LH	CA	
Core verbal element(s)			
V	{V} etc.	[V] etc.	The verb.
V1			The first verb in a multi-verb construction.
V2, V3 etc.			The second or subsequent verb in a multi-verb construction, such as a serial verb construction, a verb with verbal complement constructions, or an auxiliary verb with main verb construction.
Core nominal argument(s)			
A	{A} etc.	[A] etc.	The single overt argument of a verb as identified by a manual sign, or shown by a 'strong' CA when not manually identified.
A1			The first expressed overt argument of a verb when there is more than one.
A2, A3, etc.			The second or subsequent expressed overt argument of a verb when there is more than one.
nonA	{nonA} etc.	[nonA] etc.	Any element of a clause that can be regarded as a non-argument, i.e., circumstantial elements or elements that modify a core head noun or core head verb.
Unresolved two-way analysis			
Indefinite			A constituent or an entire CLU that can be analysed equally in one of two ways due to the indeterminacy of the grammatical class of core elements. So if two core constituents of a CLU (or the CLU itself) were tagged 'indefinite' this it could mean that the two elements can be analysed as a A1 A2 sequence (assuming both are nominals of some kind) a V A or a A V sequence (assume one is nominal and the other verbal).
No convincing constituency			
Indeterminate			A sign or series of sign-like articulations that appears to be one unit but whose meaning is not easily defined and/or resists segmentation into constituents and hence any argument-like analysis.

3.2.1.1.1 The overt subject tier

This now discontinued tier was used in a study (McKee, Schembri, McKee, & Johnston 2011) to tag on the verb in a CLU for the presence or absence, in the same CLU, of an overt manual sign which expressed a 'subject-like' argument. This information assisted in determining if the lack of an overtly expressed subject-like argument correlated with the presence or absence of particular linguistic factors.

Table 18 The CV for overt subject

Tag	Expansion	Explanation
y	yes	Yes, overt 'subject' present and it is a pronoun
c	yes, common noun	Yes, overt 'subject' present and it is a common noun
p	yes, proper noun	Yes, overt 'subject' present and it is a proper noun
n	no	No, overt 'subject' not present
n/a	not applicable	Tagged to a non-argument to show that it has been considered rather than accidentally omitted

However, with the implementation of clause constituent argument tagging as just outlined, and clause Akionsart and transitivity tagging (explained below in Section 3.2.2) determining if the lack of an overtly expressed subject-like argument correlates with verb morphology, position in clause, and constructed action (i.e., without assuming the grammatical relation 'subject') is now possible by using multi-tier searches for overlaps of these types of tags, see Johnston (in press for 2019).

3.2.1.1.2 Multi-verb constructions

As with arguments, the presence of a V1 code implies that there is also a V2 in the clause. Auslan appears to allow multi-verb clausal constructions of at least 3 types.

(i) Verb modifying verb constructions

In these constructions one verb functions as an auxiliary, helping or modifying verb. In the following example the first verb conveys aspectual information. In the annotation schema it is not tagged as a non-A (something that simply modifies a head element, or is an adjunct): it is tagged as a V (in this case V1) with distinctive tagging on macro-role and semantic-role tiers to distinguish it from the other two types of multi-verb constructions.

(76)

ClauseLikeUnit(CLU)	BRCc4aCLU_B_M_67_NN#03		
RH-Arg	nonA	V1	V2
RH-MacroR		ASPECT	PROCESS
RH-SemR		INCEPTIVE	ACTION
RH-IDgloss	NOT-YET	START	SPEECH-2H
RH-GramCls	Adv	Aux	VIDir
LH-IDgloss	NOT-YET	START	SPEECH-2H
LitTransl	(they) not-yet start speak		
FreeTransl	They hadn't started to speak yet.		

(ii) Verbal complement constructions

In these constructions one verb is an argument of the other verb, i.e., it is a complement. It completes the verb phrase. In our annotation schema, it is not tagged as an argument: it is tagged as V (in this case V2) with distinctive tagging on the macro-role and semantic-role tiers to distinguish it from the other two types of multi-verb constructions.

(77)

RH-IDgloss [136]	TRY	HELP
RH-GramCls [134]	VP	VIDir
ClauseLikeUnit(CLU) [44]	AKR_c2a_A_F_25_N_CLU#16	
RH-Arg [133]	V1	V2
RH-MacroR [88]	PROCESS	COMPLEMENT
RH-SemR [88]	ACTION	ACTION
CA [19]	[CA:VILLAGERS]	
LitTransl [44]	(people) try help	

(ii) Serial verb constructions

In the following example, the three verb signs describe one complex event that could be translated as "I was running going towards the village yelling", because it is really one clause, rather than a series of three clauses two of which have omitted subject-like arguments.

(78)

RH-IDgloss [223]	PT:PRO1SG	RUN	GO-POINT	YELL
ClauseLikeUnit(CLU) [68]	BFS_c2a_B_F_55_N_CLU#55			
RH-Arg [217]	A	V1	V2	V3
RH-MacroR [127]	ACTOR	PROCESS	PROCESS	PROCESS
RH-SemR [127]	AGENT	ACTION	ACTION	ACTION
CA [51]	[CA:BOY]			
LitTransl [68]	me run go-to (village) yell			

Auslan appears to allow serial verb constructions, i.e., the predicating verb can be realized by several apparently separate verbs in a tight series. A verb sequence of this type is coded as V1 V2 V3 as appropriate, as in the example above. For a series of verbs to be called a

73

serial verb and be identified as one predicate, the first criterion of the following four must be satisfied, as well as at least two of the others:

1. The verbs appear to have the same 'subject'
2. There is semantic unity in the action being described, i.e., it is really one complex action.
3. The verbs appear to form as one phonological unit.
4. The prosody of the string of verbs and other constituent signs suggest one overall unit.

3.2.1.1.1.3 CA arguments

Arguments may be expressed in Auslan through CA alone or simultaneously with a manual signs (cf. body partitioning). In other words the enactment is very rich and involves much more than just a subtle mouth or facial expressions (a mouth gesture) that qualifies how the signed action was performed (by the implied actor), or even a modification of the manual sign to show how the action was performed (again by the implied actor); rather, it involves both of these together with the body (head and upper torso) of the signer as a whole in a very overt enactment of someone doing or experiencing something. Even if the actor or ex-periencer is not named in the clause, it seems misleading to say that with such full enact-ment that the argument has been omitted. This type of rich CA has been called overt CA in the literature (Cormier, Smith, & Sevcikova 2015).

In the Auslan annotation schema, argument, macro-role and semantic role annota-tions are made for periods of full overt argument-like CA. However, even if there is an overt and full period of CA in a CLU, the CA is not given argument status if the argument is also overtly manually expressed in the same CLU, i.e., also named with a lexical sign or indicated with a pronoun-like pointing sign. Clearly, the argument associated with the action would be known from the signed referent alone, with or without the full CA. This is coded on daughter argument structure tiers of the CA tier. The action (verb) can be expressed manually or non-manually during the period of CA. For example

(79)

In this example "the boy looked at the frogs" is expressed with the manual lexical sign LOOK with a rich and overt CA of the boy looking down (at the frogs); "the boy looked longingly at the frogs" is expressed only with an enacted longing look, a non-manual gestural enactment G(NMS):HUMAN-LOOKS-LONGINGLY; finally "the father frog handed the boy a baby frog" is ex-pressed with a handling depicting sign DSH(FLATBC):GIVE-SMALL-OBJECT. The characters per-forming the actions are identified on the CA tier, e.g., [CA:BOY] or [CA:FROG] respectively. The existence of the ID-gloss placeholder for the non-manual gesture, means it is possible to code it as V.

3.2.1.1.1.4 Overt/covert arguments in depicting signs

Depicting signs can function primarily as verbs or nouns. Some complex depictions function as CLUs in their own right. Arguments can find expression in the handshapes and locations used on the dominant and subordinate hands. For a single complex stand-alone depictions like these, we simply use the clause argument tag *V*, for verb. (In other words, we consider the 'incorporated' elements to be akin to the incorporated arguments of indicating verbs. Further detail annotation of these signs would occur on the same tiers described for the indicating verbs.)

3.2.1.1.1.5 Indeterminate CLUs

In some CLUs no coherent labelling in terms of argument and constituent structure appears possible, e.g., it may be a visual representation, a complex depiction, a rich enactment. These CLUs are labelled as INDETERMINATE on the clause argument tier (selecting the entire time period of the clause as the annotation field). Some other CLUs also appear to have no identifiable structure in terms of verbs and arguments, e.g., they may be formulaic expressions such as salutations. These, are labelled as FRAGMENTS.

3.2.1.1.1.6 Indefinite CLUs

Some CLUs can be analysed in two ways, with each appearing equally plausible. When it appears impossible to make a decision one way or another but one does not wish to imply or claim that the CLU is actually indeterminate in structure (as just described above), the label INDEFINITE is applied to the core constituents or to the CLU (once again on the argument tier, selecting the entire time period of the clause as the annotation field in the latter case). These INDEFINITE CLUs may be revisited at a later pass of the text. An assignment may be able to be given then, in the light of other similar examples, or they may remain INDEFINITE (essentially examples of structural/syntactic 'ambiguity', or better 'under specification', in the language).

3.2.1.1.2   The macro-role of argument tier

Macro-role tags label the role the verbs and arguments play in the clause in the broadest possible sense, e.g., *process, complement, relation,* or *aspect* for verbs; *actor, undergoer, carrier,* or *attribute* for arguments (see Table 19 for an explanation). Non-arguments are not tagged on this tier (they will be when phrase structure analysis is initiated).

Table 19 The CV for macro-roles tier

Macro-role tier tag*	Explanation
V (Verb)	
PROCESS	A process of some kind that is named by a verb.
COMPLEMENT	Verbs that appear next to (almost always immediately after) another verb and the sequence forms the verbal core of one CLU. These are not serial verbs (one complex or unified action), rather the complement verb completes the main verb, i.e., they are verbal arguments, e.g., WANT GO, or TRY STOP, etc. Note that if the complement verb is itself part of a CLU-type unit, i.e., has its own core argument(s), then the material after the first verb is annotated as a separate CLU and tagged on other tiers as being embedded as an argument of the first verb of the matrix clause.

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Macro-role tier tag*	Explanation
RELATION	A linking verb that express the equivalence or resemblance of two things, the change of state of an entity, or coming into being of an entity, e.g., HAVE, LOOK, SEE, SAME, BECOME, ABOUT.
ASPECT	Verbs that appear next to another main verb and the sequence forms the verbal core of one CLU. These are not serial verbs (one complex or unified action) or verbal complements, rather the aspect verb modifies the main verb, e.g., START LEARN, STOP SWIM, FINISH EAT, etc.
A (Argument)	
ACTOR	An actor-like argument of the verb, i.e., the entity that does something with a high degree of control or intentionality.
UNDERGOER	A non-actor-like core argument of a verb, such as a patient, beneficiary (recipient), verbiage (something said, or thought, which is attributed to someone) or enactment (acting out something said to be done by someone). However, an UNDERGOER is often the best tag for the single argument of an intransitive verb that has no actor-like qualities. It is simply involved in the action in some ways such as the experiencer of a sensation or state, or something that is said to exist (somewhere). Some adjunct-like elements in Auslan (esp. LOCATION and INSTURMENT) sometimes warrant being given argument status, especially nominals that 'name' the end point of verbs of motion. However, if introduced by a preposition in Auslan they are usually treated as English-like adjuncts and coded nonA rather than arguments. There appear to be no sequential (slot allocation), or morphological or prepositional markings that flag core arguments in Auslan: core or non-core argument status appears not be strongly syntacticized.
CARRIER	One of two arguments that are juxtaposed and form a CLU, i.e., not a phrase. They represent propositions or predications in themselves, rather than being part of a larger predication. Usually no verb links the two. The carrier appears to be the thing about which the attribute adds further information.
ATTRIBUTE	One of two arguments that are juxtaposed and form a CLU, i.e., not a phrase. They represent propositions or predications in themselves, rather than being part of a larger predication. Usually no verb links the two. The attribute appears to add information about the carrier.
nonA (non-Argument)	
N/A	N/A
Notes	
* LH-MacroR with { }	i.e., all roles where LH is distinct are written with surrounding curly brackets, thus: {ACTOR}
* CA-MacroR with [ ]	i.e., all roles where CA alone shows constituent are written with surrounding curly brackets, thus: [ACTOR]

Examples of verb macro-role annotation (PROCESS, COMPLEMENT, RELATION, ASPECT):

(80) PROCESS

	00:01:52.000	00:01:52.500	00:01:53.000	00:01:53.500
RH-IDgloss [190]	BIG		WOLF	COME
ClauseLikeUnit(CLU) [60]	BDC_c2a_B_M_60_NN_CLU#48			
RH-Arg [187]	nonA		A	V
RH-MacroR [118]			ACTOR	PROCESS
LitTransl [60]	big wolf come			
FreeTransl [38]	A big wolf was approaching!			

(81) COMPLEMENT

	00:02:44.900	00:02:45.000	00:02:45.100	00:02:45.200	00:02:45.300	00:02:45.400	00:02:45.500	00:02:45.600	00:02:45.700
RH-IDgloss [581]	PT:PRO1S	REAL				WANT		GO-OUT	
ClauseLikeUnit(CLU) [26]	PJLG_c5_P_M_16_N_CLU#10								
RH-Arg [11]	A	nonA				V1		V2	
RH-MacroR [6]	ACTOR					PROCESS		COMPLEMENT	
LitTransl [27]	i really want leave								
FreeTransl [1]	I really wanted to leave.								

(82) RELATION

	00:09:54.400	00:09:54.600	00:09:54.800	00:09:55.000	00:09:55.200	00:09:55.400	00:09:55.600
RH-IDgloss [902]	DEAF	SAME		OBLIVIOUS			
ClauseLikeUnit(CLU) [79]	MGC_c4a_M_M_63_NN_CLU#53						
RH-Arg [15]	A1	V		A2			
RH-MacroR [11]	CARRIER	RELATION		ATTRIBUTE			
LitTransl [79]	deafness same oblivious						
FreeTransl [9]	Deafness was oblivious to us. / We were oblivious to our deafness (when we signed with each other).						

(83) ASPECT

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RH-IDgloss [639]	PT:PRO1SG	THINK	PT:PRO	SAY	FINISH.GOOD-1H	PT:PRO3SG(7)
ClauseLikeUnit(CLU) [91]	AAM1_c4_A_M_34_N_CLU#25		AAM1_c4_A_M_34_N_CLU#26			
RH-Arg [197]	A	V	A1	V1	V2	A2
RH-MacroR [116]	ACTOR	PROCESS	ACTOR	PROCES	ASPECT	UNDERGOER
LitTransl [92]	yes i think		(that) i say finish-anterior that.			
FreeTransl [18]	I think I've already said that.					

(84) ASPECT

RH-IDgloss [438]	START		PUT-2H	READY-2H	GOOD-2H
ClauseLikeUnit(CLU) [56]	SSN_c3_S_M_30_N_CLU#19				
RH-Arg [36]	V1		V2	V3	nonA
RH-MacroR [19]	ASPECT		PROCESS	PROCESS	
LitTransl [56]	(we) start packing-getting-ready good				
FreeTransl [48]	We started packing our stuff and getting ready, great.				

Examples of argument macro-role annotation (ACTOR, UNDERGOER, CARRIER, ATTRIBUTE):

(85) ACTOR & UNDERGOER

RH-IDgloss [269]	RAM	EAT	GRASS
LH-IDgloss [174]	RAM		GRASS
ClauseLikeUnit(CLU) [77]	SPK_c2a_S_F_50_NN_CLU#12		
RH-Arg [268]	A1	V	A2
RH-MacroR [158]	ACTOR	PROCESS	UNDERGOER
LitTransl [77]	sheep eat grass		
FreeTransl [32]	The sheep graze on the grass up there.		

(86) UNDERGOER & ACTOR

RH-IDgloss [113]	SHEEP	CATCH	FS:WOLF
LH-IDgloss [44]		CATCH	FS:WOLF
ClauseLikeUnit(CLU) [46]	MBC_c2a_M_64_NN_CLU#30		
RH-Arg [110]	A1	V	A2
RH-MacroR [83]	UNDERGOER	PROCESS	ACTOR
LitTransl [46]	sheep catch/bite wolf		
FreeTransl [15]	The wolf had caught and eaten all the sheep/The sheep had been caught and eaten by the wolf.		

(87) UNDERGOER

RH-IDgloss [147]	SURPRISED	FROG	DISAPPEAR	
LH-IDgloss [91]	SURPRISED		DISAPPEAR	
LitTransl [44]	oh! frog disappear			
ClauseLikeUnit(CLU) [56]	SMC_c7a_S_F_65_NN_CLU#06			
RH-Arg [131]	nonA	A	V	
RH-MacroR [8]		UNDERGOER	PROCESS	
FreeTransl [19]	Surprisingly, the frog had vanished.			

(88) ATTRIBUTE & CARRIER

RH-IDgloss [17]	WHY-BECAU	WHAT	SEE	SAME	FS:SANTA		OR	FS:KFC	PT:PRO1SG
RH-GramCls [13]	Wh-ProQ	Wh-ProQ	VIDir	Adv	NLoc		Conj	NLoc	Pro
ClauseLikeUnit(CLU) [3]	SAS_c1_S_M_46_N_CLU#02								
RH-Arg [12]	nonA	nonA	V	nonA	A1		nonA	A1	A2
RH-MacroR [6]			RELATIO		ATTRIBUTE			ATTRIBUTE	CARRIER
LitTransl [3]	why what (because) look same santa or kfc i								
FreeTransl [3]	because I look like Santa or Colonel Sanders								

Verbless attributive clauses also occur in Auslan. The CARRIER (or identified) and the ATTRIBUTE (or identifier) are simply juxtaposed without a linking verb. This is unlike English where they are linked with a verb: X *is* Y, X *seems* Y, X *looks* Y, X *has* Y. The first form, linked by a form of the verb *to be*, does not exist in Auslan because it has no verb *to be*. However, a number of verb signs, such as HAVE, LOOK, SEE, MEAN, etc., can be used as linking verbs, as in example (88). (89) is an example of a verbless attributive clause:

(89) ATTRIBUTE & CARRIER

	05.000	00:00:05.200	00:00:05.400	00:00:05.600	00:00:05.800	00:00:06.000	00:00:06.200	00:00:06.400	00:00:06
RH-IDgloss [247]	FAMOUS					STORY			
ClauseLikeUnit(CLU) [119]	SLR_c2b_S_F_48_N_CLU#03								
RH-Arg [248]	A1					A2			
RH-MacroR [196]	ATTRIBUTE					CARRIER			
LitTransl [119]	well-known story								
FreeTransl [46]	The story is well known.								

The lack of an overt linking verb in many attributive constructions means that it is sometimes difficult to distinguish between a juxtaposition which is a clause, as found in example (89), and a noun phrase in which one element is adjectival and the phrase itself is a constituent of a clause (as in "*The well-known story* is called "The hare and the tortoise"). The proposed attributive CLU must appear to stand alone as an utterance unit (proposition) rather than be a smoothly incorporated element of a large unit which is the real proposition.

3.2.1.1.3 The semantic role of argument tier

Semantic roles are divided up and labelled in many different schemas and terminologies by many different linguists with the result that many of the categories overlap. There is no definitive categorization. The number of roles range from just a few, such as *Source, Location, Goal*, to potentially extremely large lists in which specific semantic roles are assigned for each verb, such as *lover/lovee* of the verb *love*.

Given that there is no definitive categorization of semantic roles, we have opted for a modest but flexible inventory. These may be added to at any time. As it currently stands, the semantic roles linked to macro-roles are as listed in the following CV. (Once again non-arguments are not tagged on this tier.)

Table 20 The CV for semantic-roles tier

Semantic-role tier tag*	Explanation
VERBS	
PROCESSES	**Aktionsart categories: activity-like, achievement-like, accomplishment-like**
ACTION	verb that names an activity
ENACTMENT	verb-slot that expresses an action not by naming it with a lexical sign but by acting it out through a gesture or a (handling) depicting sign
RELATIONS	**Aktionsart category: state-like**
STATE	verb that predicates an attribute or condition of something which is in principle non-inherent in the nature of that thing, often it describes a state or asserts the existence of something
EQUIVALENCE	verb that equates two things as the same, often it describes a state
ASPECT	
ANTERIOR	verb that marks the action of a contiguous complement verb as having happened before the time of speaking (or some other reference time) yet being of relevance to the time of speaking (or that other reference time)
COMPLETIVE	verb that marks the action of a contiguous complement verb as being completed
INCEPTIVE	verb that marks the action of a contiguous complement verb as being about to happen or interrupted before being completed
ACTOR-like	
AGENT	instigator of some action, action is under agent's volitional control, including agent (*enactor*) who performs an enactment (when aligned with CA or when CA occurs contiguously to named actor/enactor in same CLU) or agent who says (*utterer*) a quoted utterance (or merely 'thinks' it attributively or metaphorically (*thinker*) (when aligned with CD or when CD occurs contiguously to a named utterer/thinker in same CLU).
UTTERER	entity who says/signs an utterance (CD) or who acts-out an enactment (CA)
EXPERIENCER	entity experiencing some psychological or physiological state
SOURCE	entity from which something moves or a sensation emanates

Semantic-role tier tag*	Explanation
UNDERGOER-like	
PATIENT	entity undergoing the effect of some action (aka 'theme')
EXISTENT	entity which is said to exist (somewhere)
UTTERANCE	a non-actor argument which is verbiage (things said/signed, constructed dialogue)
GOAL	entity towards which something moves or the thing or aim to which an action is directed
BENEFICIARY	entity benefitting from some action (aka 'benefactive') or receiving some entity by transfer ('recipient' or 'indirect object')
CARRIERS-like	
TOPIC	argument about which a comment is made
GROUND	argument which functions as the ground or reference point with respect to which a figure is located/placed
ATTRIBUTE-like	
COMMENT	argument that says something about a topic
FIGURE	argument which is spatially located with reference to another argument, usually literally but also metaphorically
PERIPHERAL (ADJUNCT) ELEMENTS**	
LOCATION	place in which something is situated (aka 'locative')
INSTRUMENT	means by which something comes about
MANNER	way in which something is done
PATH	route in which something moves
TIME	time in which an action takes place
ACCOMPANIMENT	entity which accompanies another argument
Notes	
*	Non-arguments (peripheral or adjunct elements) have not yet been given semantic role tagging in the corpus. To date they have simply been tagged as ***nonA***.
LH-SemR with { }	i.e., all roles where LH is distinct are written with surrounding curly brackets, thus: {ACTOR}
CA-SemR with [ ]	i.e., all roles where CA alone shows constituent are written with surrounding square brackets, thus: [ACTOR]

Several semantic role categories for verbs and arguments are novel: ENACTMENT (for verbs); UTTERER (for actor-like arguments); and UTTERANCE and EXISTENT (or undergoer-like arguments). ENACTMENT, UTTERER and UTTERANCE are used to capture the frequent "imitating" constructions called 'constructed dialogue' and 'constructed action', so that these types of constructions can be aggregated and compared to other constructions. (Recall the discussion in Section 2.2.2.2.)

An ENACTMENT is a verb-like sign that expresses an action by acting it out through a gesture or a depicting sign, which is usually a handling depiction, rather than by naming it with a lexical sign. (Recall discussion of gestures and depicting signs in Sections 2.1.2.2.2 and 2.1.2.3). Most enactments have not yet been explicitly distinguished in the annotations but they can still be identified as an overlap of a VERB with semantic role ACTION and an ID-gloss for a gesture or a depicting sign.

An UTTERER describes an argument which is identified as the participant who words or signs are quoted in a stretch of constructed dialogue (see Section 2.2.2.2). An UTTERANCE describes an argument which is identified as the words or signs quoted in a stretch of constructed dialogue (see Section 2.2.2.2).

Finally, existential clause constructions in Auslan require the identification of an EXISTENT role. An EXISTENT is an argument in these constructions whose simple existence is asserted, or whose existence in a particular location is asserted. The constructions often use the verb HAVE. These and the other major categories of semantic roles are exemplified immediately below.

Examples of PROCESS-like verbs with the finer semantic role categorizations of ACTION and ENACTMENT:

(90) ACTION

	00:01:52.000	00:01:52.500	00:01:53.000	00:01:53.500
RH-IDgloss [190]	BIG		WOLF	COME
ClauseLikeUnit(CLU) [60]	BDC_c2a_B_M_60_NN_CLU#48			
RH-Arg [187]	nonA		A	V
RH-MacroR [118]			ACTOR	PROCESS
RH-SemR [118]			AGENT	ACTION
LitTransl [60]	big wolf come			
FreeTransl [38]	A big wolf was approaching!			

(91) ENACTMENT

	9.000	00:01:59.500	00:02:00.000	00:02:00.500	00:02:01.000
RH-IDgloss [280]	G(CA):HUMAN-HOLDS-SOMETHING		SOLID	DSS(4):MANY-THIN-OBJECTS-EXTEND	
CA [45]	[CA:BOY]				
ClauseLikeUnit(CLU) [92]	SSN_c7a_S_M_30_N_CLU#64				
RH-Arg [274]	V		nonA	A	
RH-MacroR [169]	PROCESS			UNDERGOER	
RH-SemR [169]	ENACTMENT			PATIENT	
LitTransl [92]	[boy] hold solid multiple-thin-upright-things				
FreeTransl [33]	He held onto something like tree branches but was surprised that the 'branches' were actually a deer's or				

RELATION-like verbs with the finer semantic role categorization of STATE and EQUIVALENCE:

(92) STATE

RH-IDgloss [358]	BOY	KNOW-NOT
ClauseLikeUnit(CLU) [127]	MTF_c7a_M_F_29_N_CLU#67	
RH-Arg [360]	A	V
RH-MacroR [241]	ACTOR	PROCESS
RH-SemR [241]	EXPERIENCER	STATE
LitTransl [127]	boy unaware	
FreeTransl [35]	The boy was unaware (of what was happening with the dog and the bees)	

(93) EQIVALENCE

	00:09:54.400	00:09:54.600	00:09:54.800	00:09:55.000	00:09:55.200	00:09:55.400	00:09:55.600
RH-IDgloss [902]	DEAF	SAME		OBLIVIOUS			
ClauseLikeUnit(CLU) [79]	MGC_c4a_M_M_63_NN_CLU#53						
RH-Arg [15]	A1	V		A2			
RH-MacroR [11]	CARRIER	RELATION		ATTRIBUTE			
RH-SemR [11]	TOPIC	EQUIVALENCE		COMMENT			
LitTransl [79]	deafness same oblivious						
FreeTransl [9]	Deafness was oblivious to us. / We were oblivious to our deafness (when we signed with each other).						

ASPECT verbs with the finer semantic role categorization of ANTERIOR, COMPLETIVE and INCEPTIVE:

(94) ANTERIOR

	00:06:23.200	00:06:23.400	00:06:23.600	00:06:23.800	00:06:24.000	00:06:24.200	00:06:24.400	00:06:24.600	00:06:24.800	00:06:25.000
RH-IDgloss [639]	PT:PRO1SG	THINK	PT:PRO	SAY	FINISH.GOOD-1H	PT:PRO3SG(7)				
ClauseLikeUnit(CLU) [91]	AAM1_c4_A_M_34_N_CLU#25		AAM1_c4_A_M_34_N_CLU#26							
RH-Arg [197]	A	V	A1	V1	V2	A2				
RH-MacroR [116]	ACTOR	PROCESS	ACTOR	PROCES	ASPECT	UNDERGOER				
RH-SemR [116]	EXPERIENC	STATE	AGENT	ACTION	ANTERIOR	UTTERANCE				
LitTransl [92]	yes i think		(that) i say finish-anterior that.							
FreeTransl [18]	I think I've already said that.									

(95) COMPLETIVE

	00:00:49.800	00:00:50.000	00:00:50.200	00:00:50.400	00:00:50.600	00:00:50.800	00:00:51.000	00:00:51.200	00:00:51.400	00:00:51.600	00:00:51.800	00:00:52.000	00:
RH-IDgloss [183]	SHEEP					G(5-UP):WELL	GRAZE				FINISH.FIVE-2H		
ClauseLikeUnit(CLU) [65]	PHH_c2a_P_F_47_NN_CLU#17												
RH-Arg [124]	A					nonA	V1				V2		
RH-MacroR [17]	ACTOR						PROCESS				ASPECT		
RH-SemR [17]	AGENT						ACTION				COMPLETIVE		
LitTransl [23]	Sheep well, grazed (grass) finish-completive												
FreeTransl [16]	The sheep had grazed the grass. / The sheep had finished grazing.												

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(96) INCEPTIVE

RH-IDgloss [438]	START	PUT-2H	READY-2H	GOOD-2H
ClauseLikeUnit(CLU) [56]	SSN_c3_S_M_30_N_CLU#19			
RH-Arg [36]	V1	V2	V3	nonA
RH-MacroR [19]	ASPECT	PROCESS	PROCESS	
RH-SemR [19]	INCEPTIVE	ACTION	ACTION	
LitTransl [56]	(we) start packing-getting-ready good			
FreeTransl [48]	We started packing our stuff and getting ready, great.			

ACTOR-like participants with the finer semantic role categorizations of AGENT, UTTERER, EXPERIENCER, and SOURCE:

(97) AGENT

RH-IDgloss [190]	BIG	WOLF	COME
LH-IDgloss [112]	BIG		
LitTransl [60]	big wolf come		
ClauseLikeUnit(CLU) [60]	BDC_c2a_B_M_60_NN_CLU#48		
RH-Arg [187]	nonA	A	V
RH-MacroR [118]		ACTOR	PROCESS
RH-SemR [118]		AGENT	ACTION
FreeTransl [38]	A big wolf was approaching!		

(98) UTTERER

MouthGestF [66]		CWF	
MouthGestM [60]		EXPRESSION	
RH-IDgloss [199]	PEOPLE	SAY	BAD-2H
ClauseLikeUnit(CLU) [71]	SSN_c2a_S_M_30_N_CLU#28		
RH-Arg [199]	A1	V	A2
RH-MacroR [127]	ACTOR	PROCESS	UNDERGOER
RH-SemR [127]	UTTERER	ACTION	UTTERANCE
CA [43]			[CD:VILLAGERS]
LitTransl [71]	people say "oh-no!"		

See example (92) for EXPERIENCER.

(99) SOURCE

RH-IDgloss [320]	DOG	SCARED-2H	WATER.
ClauseLikeUnit(CLU) [115]	AAP_c7a_A_F_51_N_CLU#95		
RH-Arg [314]	A1	V	A2
RH-MacroR [228]	UNDERGOER	PROCESS	ACTOR
RH-SemR [228]	EXPERIENCER	STATE	SOURCE
LitTransl [115]	dog frighten water		
FreeTransl [54]	But the dog is frightened of the water, so the boy carries him. / But the dog is frighten		

UNDERGOER-like participant with the finer semantic role categorizations of PATIENT, EXISTENT, UTTERANCE, GOAL, and BENEFICIARY:

(100) PATIENT

RH-IDgloss [269]	RAM	EAT	GRASS
LH-IDgloss [174]	RAM		GRASS
ClauseLikeUnit(CLU) [77]	SPK_c2a_S_F_50_NN_CLU#12		
RH-Arg [268]	A1	V	A2
RH-MacroR [158]	ACTOR	PROCESS	UNDERGOER
RH-SemR [158]	AGENT	ACTION	PATIENT
LitTransl [77]	sheep eat grass		
FreeTransl [33]	The sheep graze on the grass.		

(101) EXISTENT

RH-IDgloss [298]	HAVE		FS:VILLAGE		VALLEY	
ClauseLikeUnit(CLU) [123]	STM_c2a_S_M_38_N_CLU#14					
RH-Arg [113]	V		A		nonA	
RH-MacroR [17]	PROCESS		UNDERGOER			
RH-SemR [17]	STATE		EXISTENT			
LitTransl [38]	have village valley					
FreeTransl [39]	There is a village in a valley					

See example (98) for UTTERANCE.

(The examples of UTTERER and UTTERANCE illustrate simple one or two word utterances which are not, in themselves, separate CLUs, i.e., the utterances are not embedded clauses. These types of constructed dialogues are described below in Section §3.2.2.5 which deals with the annotation of relationships between clauses.)

(102) GOAL

RH-IDgloss [145]	PT:PRO1SG	ALWAYS	ARRIVE	PT:LOC(7)	ALRIGHT
ClauseLikeUnit(CLU) [54]	AFL_c2b_A_F_52_N_CLU#14				
RH-Arg [144]	A1	nonA	V	A2	nonA
RH-MacroR [82]	ACTOR		PROCESS	UNDERGOER	
RH-SemR [82]	AGENT		ACTION	GOAL	
LitTransl [54]	i always arrive there fine				
FreeTransl [24]	I always arrive wherever without any problems.				

(103) GOAL

RH-IDgloss [136]	G(5-UP):WELL	PT:PRO3SG(	TRY	ASK	FOR.NTH	HELP
ClauseLikeUnit(CLU) [44]	AKR_c2a_A_F_25_N_CLU#36					
RH-Arg [133]	nonA	A1	V1	V2	nonA	A2
RH-MacroR [88]		ACTOR	PROCESS	COMPLEMENT		UNDERGOER
RH-SemR [88]		AGENT	ACTION	ACTION		GOAL
LitTransl [44]	well, yes, he try ask for help					
FreeTransl [25]	The boy tried to ask for help.					

(104) BENEFICIARY

RH-IDgloss [143]	PT:DET		FS:FROG	GIVE(S>5)-1H	BOY	ONE
ClauseLikeUnit(CLU) [59]	BDCc7a_B_M_60_NN_CLU#56					
RH-Arg [125]	nonA		A1	V	A2	A3
RH-MacroR [13]			ACTOR	PROCESS	UNDERGOER1	UNDERGOER2
RH-SemR [13]			AGENT	ACTION	BENEFICIARY	PATIENT
LitTransl [59]	the frog give boy one					
FreeTransl [26]	The frog gave the boy one of the baby frogs.					

CARRIER and ATTRIBUTE constituents with the finer semantic role categorizations of TOPIC, GROUND, COMMENT, and FIGURE:

(105) TOPIC & COMMENT

RH-IDgloss [902]	DEAF	SAME	OBLIVIOUS	
ClauseLikeUnit(CLU) [79]	MGC_c4a_M_M_63_NN_CLU#53			
RH-Arg [15]	A1	V	A2	
RH-MacroR [11]	CARRIER	RELATION	ATTRIBUTE	
RH-SemR [11]	TOPIC	EQUIVALENCE	COMMENT	
LitTransl [79]	deafness same oblivious			
FreeTransl [9]	Deafness was oblivious to us. / We were oblivious to our deafness (when we signed with each other).			

(106) GROUND & FIGURE

	00:01:00.500	00:01:01.000	00:01:01.500	00:01:02.000	00:01:02.500
RH-IDgloss [122]	TABLE		CAKE		
ClauseLikeUnit(CLU) [45]	MBC_c9a_M_64_NN_CLU#05				
RH-Arg [125]	A1		A2		
RH-MacroR [97]	CARRIER		ATTRIBUTE		
RH-SemR [97]	GROUND		FIGURE		
LitTransl [46]	table cake-on-it				
FreeTransl [29]	There's a table with a cake on it.				

3.2.1.1.4 The status of location

The peripheral roles in Table 20 (LOCATION, INSTRUMENT, MANNER, PATH, TIME, ACCOMPANIMENT) express circumstantial meanings which modify the process involving the verb and its core arguments. They tend not to be realized cross-linguistically as overt core arguments but as lexical verb modifiers (adverbs), or as adjuncts or obliques (adpositional phrases or as affixes on nouns). In the Auslan Corpus, adverbs, adverbial phrases and adpositional phrases, when they occur, are similarly non-arguments and are tagged nonA and thus are not tagged further for macro or semantic roles.
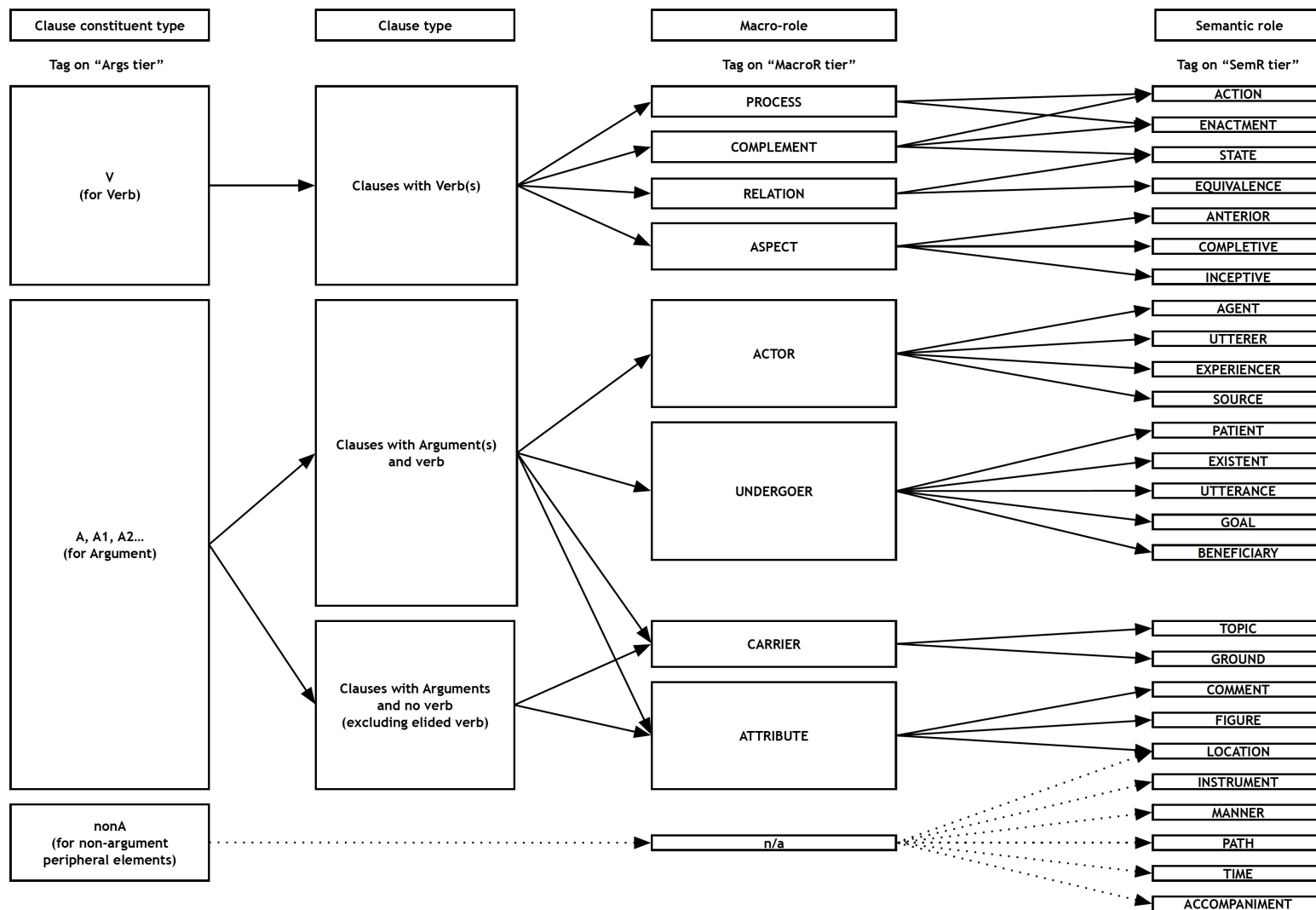
Furthermore, in Auslan and other signed languages, these circumstantial meanings often do not occur as separate overt adverbs or adjuncts; rather, they are often expressed as features or modifications of core constituent signs, i.e., verbs and nominal arguments. For example, a verb sign can be placed in the signing space and, if it has a path movement, then the actual path can be also modified meanings (including the beginning and end points) to show these meanings; and a noun sign can be placed in the signing space above, below, next to or far from a second located noun sign to show relative location of both entities. So, once again, there is no opportunity to use these peripheral semantic role tags with these signs.

Nonetheless, on occasion it has appeared desirable to code some overt signs as core arguments with the semantic role LOCATION because they do not appear to be peripheral modifications to the core meaning of the clause. For example, in some verbless existential constructions that assert the existence of an entity at a location, the location appears to have core, rather than circumstantial weight:

(107)

	DOG	DSM(BENT2):ANIMAL(jump)		WHY-BE	PT:LOC	FS:BEEHIVE(BEHIV)
RH-IDgloss [280]	DOG	DSM(BENT2):ANIMAL(jump)		WHY-BE	PT:LOC	FS:BEEHIVE(BEHIV)
LH-IDgloss [169]	DSS(1):VERTICAL-TREE-TRUNK					FS:BEEHIVE(BEHIV)
ClauseLikeUnit(CLU) [92]	SSN_c7a_S_M_30_N_CLU#41			SSN_c7a_S_M_30_N_CLU#42		
RH-Arg [274]	A	V		nonA	A1	A2
RH-MacroR [169]	ACTOR	PROCESS			CARRIER	ATTRIBUTE
RH-SemR [169]	AGENT	ACTION			LOCATION	EXISTENT
LH-Arg [28]	{nonA}					
CA [45]		[CA:DOG]				
LitTransl [92]	tree-trunk dog jump-up-and-down			because there beehive		
FreeTransl [34]	The dog jumped up and down repetedly at the tree because there was a beehive in it.					

3.2.1.2 Summary of manual sign Argument & Constituent tagging

Clause constituent type	Clause type	Macro-role	Semantic role

Tag on "Args tier"

Tag on "MacroR tier"

Tag on "SemR tier"

V
(for Verb)

Clauses with Verb(s)

PROCESS

COMPLEMENT

RELATION

ASPECT

ACTION

ENACTMENT

STATE

EQUIVALENCE

ANTERIOR

COMPLETIVE

INCEPTIVE

A, A1, A2...
(for Argument)

Clauses with Argument(s)
and verb

ACTOR

UNDERGOER

AGENT

UTTERER

EXPERIENCER

SOURCE

PATIENT

EXISTENT

UTTERANCE

GOAL

BENEFICIARY

Clauses with Arguments
and no verb
(excluding elided verb)

CARRIER

ATTRIBUTE

TOPIC

GROUND

COMMENT

FIGURE

LOCATION

INSTRUMENT

MANNER

PATH

TIME

ACCOMPANIMENT

nonA
(for non-argument
peripheral elements)

n/a

3.2.2   Clause level annotation and tagging[31]

Clause level annotations focus on the clause itself as a single unit or the relationship of the clause to the clause or clauses that are contiguous with it. The tiers used to annotate these clause level features are shown in Table 21.

Table 21 The tiers that related CLUs to each other

Parent tier ↳ Child tier	Expanded name/explanation	Linguistic type
ClauseLikeUnit(CLU)	Clause-like unit ('utterance/meaning unit')	**BasicAnnotation**
LitTransl	Literal translation	BasicAnnotation
CLUmood	Mood	BasicAnnotation
CLUaktionsart	Event type or Aktionsart	BasicAnnotation
CLUtransitivity	Transitivity type	BasicAnnotation
CLUwithinCLU	Complement and embedded CLUs	BasicAnnotation
↳ OvertEmbeddedType	Nature of expression of embeddedness	BasicTag
CLUcomplex	CLUs overtly related to each other	BasicAnnotation
↳ OvertDependencyType	Nature of expression of dependency	BasicTag
CLUcomposite	Sentence complexity	BasicAnnotation

3.2.2.1   The literal translation tier

The literal translation is an annotation aligned to the entire clause, rather than individual signs. The literal translation tries to capture what is conveyed by the overt manual signs clause by clause. The literal translation attempts to show what is expressed explicitly in the lexis or in the way the chosen signs are produced, on the one hand, and what is expressed implicitly, is elided or has to be inferred, on the other hand. Consequently, the literal translation is often not grammatically correct English, e.g., tense markers are omitted and determiners are only written if an equivalent is expressed in the manual signing. (In Auslan, there are no tense markers and determiners are usually not expressed.)

There are no fixed rules for how the literal translation must be done because annotators often feel a need to be somewhat creative to best capture in a short linear text what is going on. Nonetheless the general practice is that signs that express complex meanings are usually written with more than one word so as to capture the sense of the manual sign. The multiple words are joined by hyphens to show they are all part of one sign, as in (91), (94), (95), (98), and (106). Pointing signs with multiple functions are a good example of this practice:

(108)

Understood or omitted arguments are usually put in parentheses, as above in (108) as well as in the earlier examples (76), (77), (78), (79), (84) and (96).

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[31] Adapted from a schema first developed and trialed by Gabrielle Hodge as part of her doctoral research on clause combining in Auslan (Hodge 2013), supervised by Trevor Johnston.

Arguments that are associated with locations in the signing space and which find expression in the orientation or direction changes of overt manual indicating signs are added before or after hyphens for the word in the literal translation associated with the modified sign, as in examples (65) or in example (109) following.

(109)

	18.984 00:00:19.068 00:00:19.152 00:00:19.236 00:00:19.320 00:00:19.404 00:00:19.488 00:00:19.572 00:00:19.656	00:00:19.740 00:00:19.824 00:00:19.908 00:00:19.992 00:00:20.076 00:00:20.160 00:00:20.244 00:00:20.328 00:00:20.412 0
Head [9]		TURN-LEFT, TILT-BACK
Face [1]		quizzical
Gaze [65]		left-up
RH-IDgloss [199]	COINCIDENCE	TORTOISE	LOOK
RH-ModOrVar [120]		n	m
ClauseLikeUnit(CLU) [93]	STC_c2b_S_M_36_N_CLU#11	
RH-Arg [199]	nonA	A	V
RH-MacroR [148]		ACTOR	PROCESS
RH-SemR [146]		AGENT	ACTION
CA [67]		[CA:TORTOISE]
LitTransl [93]	suddently tortoise look-hare	
FreeTransl [37]	Suddenly the tortoise turned to look quizzically at the hare.	

One can also see from (108) and (109) that it is not just the wording of the literal translation that helps the reader appreciate what is expressed through the signers choice of lexical item and possible spatial and directional modifications of lexical items, it is also the comparison of the literal translation with the free translation which is informative. Meanings expressed through other features of sign delivery—such as body stance and posture, eye gaze and facial expression, all of which are annotated on other tiers—become evident on the free translation tier. In (109) the turning of the tortoise's head up and towards the hare and his quizzical facial expression is only expressed in the free translation.

The relationship of the particular CLU to another CLU is always evident in the literal translation if this is overtly expressed in the manual lexis, e.g., with signs like PRETEND, BECAUSE, BUT, etc., as in examples (44) and (58) above, and (110) following:

(110)

	00:08:55.700 00:08:55.800 00:08:55.900 00:08:56.000 00:08:56.100	00:08:56.200 00:08:56.300 00:08:56.400 00:08:56.500 00:08:56.600 00:08:56.700 00:08:56.800 00:08:56.900 00:08:57.000 00:08:57.100	00:08:57.200 00:08:57.300 00:08:57.400 00:08:57.500 00:08:57.600 00:
RH-IDgloss [639]	BUT	FS:S(FALSE-START)	PT:PRO3SG	FIFTEEN	FS:Y-YEAR
LH-IDgloss [298]		FS:S(FALSE-START)		FS:Y-YEAR	PAST
ClauseLikeUnit(CLU) [82]	AAM1_c4_A_M_34_N_CLU#36			
LitTransl [93]	but s... that fifteen year ago			
FreeTransl [20]	But that was fifteen year ago.			

However, many logical or temporal relationships between ideas or events (and thus clauses) often need to be inferred by the interlocutor in Auslan because they are often not explicitly coded using lexical grammatical markers. For such clauses the literal translation shows that there is an implied relationship (which the interlocutor needs to infer) by placing the English words that would be used to express that relationship in parentheses. These types of literal translations are discussed and exemplified in the discussion of the annotation of the relationships between clauses (see section §3.2.2.5).

3.2.2.2 The mood tier

Mood annotation identifies sentence or clause type as declarative, interrogative, and imperative. Two minor types are also identified but they are primarily reserved for fragments: interactive and exclamation. Sub-types of some of these are also identified (Table 22).

These annotations make it possible to quantify the characteristics of each clause type to assist in grammatical analysis. For example, declaratives may be aggregated to compare their sign order with that of interrogatives, or to compare their overtly expressed arguments with that of imperatives. One aspect of the grammar of Auslan and other signed languages which appears particularly salient for grammatical organization is the role of non-manuals, e.g., with respect to question formation, conditional sentences, and topicalization. The mood tagging adopted here is intended to assist in determining which non-manuals are rare, typical or obligatory with each type or sub-type and their precise function (or, indeed, if a general macro-function can explain their presence across sentence types).

Table 22 The controlled vocabulary (CV) for mood tags

Mood tag	Sub-category tag
Declarative	
	Declarative with topic
	Declarative(apodosis)
	Declarative(protasis)
Interrogative	
	Interrogative with topic
Imperative	
	Imperative with topic
Interactive	
Exclamation	

3.2.2.3   The event type (Aktionsart) tier

This tier tags the overall meaning of the CLU in terms of the types of event they instantiate (STATES, ACTIVITIES, ACCOMPLISHMENTS, ACHIEVEMENTS) as summarized in the following table.

Table 23 Akionsart tags and their semantic features

STATES	ACTIVITIES	ACCOMPLISHMENTS	ACHIEVEMENTS
Stative	Dynamic	Dynamic	Dynamic
Durative	Durative	Durative	Punctual
Atelic	Atelic	Telic	Telic

By identifying clauses as States, Activities, Accomplishments or Achievements we can quantify how the occurrence of some linguistic variable, such as the use of the type of auxiliary that expresses perfective aspect, correlates with the semantics of the modified verb (i.e., the clause). These data can help determine if the distributional facts are driven primarily by semantics or reflect the existence of an obligatory grammatical coding device. An implementation of this type of tagging was used in Johnston et al (2015).

3.2.2.4   The transitivity tier

This tier tags the overall meaning of processes expressed by the verb in a clause in terms of its inherent participants: one (intransitive), two (transitive), three (ditranstive). Attributive clauses, which do not require a verb at all because one cannot say a verb has been elided, are also given a distinctive annotation tag on this tier.

By identifying clauses by process type we can correctly quantify when arguments are omitted or elided. For instance, a VA or AV pattern in a transitive CLU has at least one elided argument, whereas a VA or AV pattern in an intransitive CLU has no elided

arguments. We are also then in a position to determine if the order of verbs and arguments (or modifications, when present, to the form of the verb) correlates with the alignment of macro-roles, and semantic roles. This would provide evidence (or lack of evidence) of syntactic relations in the language (Johnston in press for 2019). We are also then in a position to determine if the lack of an overtly expressed argument correlates with overt verb morphology or syntactic relations.

Finally, as with the mood tier, clauses that appear to have a 'topic-like' constituent are identified, in order to help determine in later grammatical analysis if any particular constituent order could be considered 'marked' or 'topical' and/or if any particular non-manual feature preferentially or obligatorily co-occur with topic-like constituents.

Table 24 Transitivity tags

Type tag	Sub-type tag	Explanation
t		Transitive clause with two (or three) inherent participants
	top_t	Transitive clasue with a topic-like argument
i		Intransitive clasue with only one inherent participant
	top_t	Intransitive clause with a topic-like argument
a_a		Verbless attributive clause with only two participants or one participant and one quality-like sign juxtaposed
	top_a_a	Verbless attributive clause with a topic like argument
_a_		Verbless attributive clause with topic/carrier understood
ø		A fragment which is not a clause

A note on transitivity In English, some verbs may be used transitively or intransitively, such as *eat* in *He ate a cake* and *He's very healthy because he eats well*. Similarly, in Auslan some verb signs can be used both ways: PRO3SG LOOK WOLF *He looked at/watched/saw the wolf* and PRO3SG LOOK *He looked around*. One always needs to consider at how a particular verb is used in context to make a judgement as to whether that meaning normally implies two arguments (or even three). If it does it is transitive and the fact that one or more arguments may actually be absent does not render the verb intransitive — they are merely elided.

A note on absent arguments In Auslan, arguments are often not expressed overtly — they are elided (omitted or 'dropped') and are understood from context. Indeed, many CLUs consist only of a transitive or intransitive verb sign. However, even though a transitive verb may have only one overtly expressed argument in its CLU, or an intransitive one have no overt argument, the argument may still be covertly expressed. Covert expression can be manifested in simultaneous constructed action, verb modification in terms of space (location and/or direction in indicating signs) or handshape (incorporation of a handshape in depicting signs). These phenomena can be identified as absent or present in any given CLU by examining the overlapping annotations on tiers dedicated to constructed action, verb modification, or glossing. Importantly, the correlation of these factors in the Auslan Corpus appears to suggest that elided arguments need not be covertly expressed in Auslan for CLUs to be well-formed, see Johnston (in press for 2019).

3.2.2.5 Clause complexity annotation

Clause complexity annotation identifies the relationship of clauses to each other and identifies the larger composite clauses (or *complex sentences*) that they form. Complex sentences can consist of one clause embedded in another clause which is called the matrix clause (or *matrix sentence*), or they can consist of two or more clauses which are overtly linked to form a complex sentence. An embedded clause can be a complement (argument) of a verb in the matrix sentence, or it may modify an argument in the matrix sentence without itself constituting an argument of the verb in the matrix sentence. The linking relationship between two clauses can be paratactic or hypotactic. Parataxis involves the linking of clauses with equal status and is usually marked with an overt manual coordinating conjunction. Hypotaxis involves the linking together to two clauses of unequal status and is usually marked with an overt manual subordinating conjunction.

3.2.2.5.1 The CLUwithinCLU tier

On the tier named *CLUwithinCLU* one tags if a CLU is a part of (contiguous with or actually within) another larger CLU, i.e., the larger CLU has the smaller CLU as one or part of one of its constituents. The larger CLU may precede, follow or 'surround' the contained CLU. This containment appears to be of two very general types: *complementation* or *modification*. Complementation 'completes' one CLU with another, e.g., the completing CLU is an argument of a verb in the other CLU. Modification adds information about, or specifies in some way, a constituent argument of the main CLU. However, a modifiying CLU does not itself alone constitute a core argument of the matrix clause.

The embedded clause is tagged CONTAINED. The material before or after the embedded clause is tagged as PRE-CONTAINED or POST-CONTAINED, as the case may be, and together with the CONTAINED clause they constitute the MATRIX clause or sentence.

The PRE-CONTAINED, CONTAINED and POST-CONTAINED tags were originally used in order to avoid pre-judging the nature of the embedded relation at the very beginning of the annotation process because one alternative label (*subordinate clause)* conflates at least two different types of embedded subordination: subordinate complement clauses (embedded), subordinate relative clauses (embedded). Indeed, it also fails to discriminate two types of dependency: coordinate subordinate clauses (paratactic dependency) and dependent subordinate clauses (hypotactic dependency). Not only did we want to keep embedded types separate from dependency types in our tagging, it was also not always clear at first parse which two types of embeddness an apparently contained clause instantiated. Hence, the use of the more general label CONTAINED for embedded clauses.

The following are examples of embedded complement CLUs and their associated annotations:

(111)

	00:02:33.500		00:02:34.000		00:02:34.500		00:02:35.000		00:02:35.500	
RH-IDgloss [339]	YELL.SCREAM-2H		FS:WOLF		FS:WOLF			GRAB-2H		G(5-UP):WELL
LitTransl [101]	(boy) yell		"wolf! wolf! catch/attack-sheep, argh!"							
ClauseLikeUnit(CLU) [101]	BRC_c2a_B_M_67_NN_CLU#84		BRC_c2a_B_M_67_NN_CLU#85							
CLUwithinCLU [14]	pre-contained		contained							
OvertEmbeddedType [8]	Lexis									
CLUcomposite [85]	Embed									
FreeTransl [49]	The boy yelled out "A wolf is attacking the sheep."									

There are two clauses in example (111). One clause is the CONTAINED CLU *"A wolf is attacking the sheep"* and the other clause (or complex sentence) is the matrix sentence which is made up of the PRE-CONTAINED CLU and the CONTAINED CLU: *The boy yelled out "The wolf is attacking the sheep"*. The CONTAINED clause is an argument (complement) of the verb YELL.SCREAM found in the PRE-CONTAINED CLU. The two CLUs could have been inverted *"The wolf is attacking the sheep," the boy yelled out*. In that case, *the boy yelled out* would be labelled the POST-CONTAINED unit.

In the following examples the contained CLU is surrounded by PRE- and POST-CONTAINED material:

(112)

		SAY	WOLF	WOLF	WOLF	REAL	WOLF	COME	SAY
RH-IDgloss [171]	LATER								
LitTransl [60]	later (oh! boy) say-them		"wolf wolf! wolf! real wolf come"						(he) say
ClauseLikeUnit(CLU) [60]	AMM_c2a_A_M_36_N_CLU#48		AMM_c2a_A_M_36_N_CLU#49						AMM_c2a_A_M_36_N_CL
RH-Arg [170]	nonA	V	A	A	A	nonA	A	V	V
RH-MacroR [118]		PROC	ACTOR	ACTOR	ACTOR		ACTOR	PROCESS	PROCESS
MatrixArgStructure [6]	[V A V] VPV								
CLUcomposite [52]	Embed								
FreeTransl [16]	A little later, he started shouting out to the villagers "A wolf is really coming", he did.								
CLUwithinCLU [13]	pre-contained		contained						post-contained
OvertEmbeddedType [7]	Lexis								Lexis

(113)

RH-IDgloss [180]	LOOK-2H	SHEEP.SHEAR	GRAZE	LOOK-2H
ClauseLikeUnit(CLU) [56]	SMG_c2a_S_F_61_N_CLU#20	SMG_c2a_S_F_61_N_CLU#21		SMG_c2a_S_F_61_N_
RH-Arg [178]	V	A	V	V
RH-MacroR [102]	PROCESS	ACTOR	PROCESS	PROCESS
MatrixArgStructure [2]	Embed [V A V] VPV			
LitTransl [56]	(he) watch	(the) sheep graze		(he) watch
FreeTransl [10]	He watched the sheep graze, he did.			
CLUwithinCLU [6]	pre-contained	contained		post-contained
OvertEmbeddedType [2]	Lexis			Lexis
CLUcomposite [52]	Embed			

There are two utterances in each of these examples. One is the simple clause in the CONTAINED CLU *("a wolf is really coming" and "the sheep graze")* and the other is the matrix clause (complex matrix sentence) which is made up of the PRE-CONTAINED CLU, the CONTAINED CLU and the POST-CONTAINED CLU *(A little later, he started shouting out to the villagers "A wolf is really coming", he did* and *He watched the sheep graze, he did,* respectively)*.

As can also be seen from the annotations in (112) and (113), CLU arguments are identified at the 'lowest' level only on the arguments tier, i.e., the two arguments in the CONTAINED CLU are identified as A and V, even though they are also, as a unit, the 'A' of the PRE-CONTAINED and POST-CONTAINED CLUs. These matrix sentence constituents and arguments are annotated separately on the MatrixArgStructure tier in square brackets, here [V A V]. (The VPV annotation on the same tier is discussed below in Section 4.1.1.1.)

The following are examples of embedded modifying CLUs and their associated annotations:

(114) With overt manual lexical sign:

RH-IDgloss [440]	YES	ONLY	FS:IF	TEACHER	PERHAPS	ONE	PERSON	WHO	LOOK-AF	DEAF-A	PERSON	UNDERSTA	PT:DET	VIEW	G(5-UP)WEL
ClauseLikeUnit(CLU) [54]	SLW_c4_S_F_49_N_CLU#46							SLW_c4_S_F_49_N_CLU#47				SLW_c4_S_F_49_N_CLU#48			
RH-Arg [40]	nonA		nonA	nonA	A	nonA	nonA	A	nonA	V	nonA	A	V	nonA	A	nonA
RH-MacroR [25]					ACTOR			ACTOR		PROCES		UNDERGOE	PROCESS		UNDERGOER
LitTransl [108]	yes only if teacher or a person							who look-after deaf person				understand this viewpoint eh
FreeTransl [89]	Yes... Only if a teacher or a person who looks after a deaf person understands that perspective, well...
CLUwithinCLU [10]	pre-contained							contained				post-contained
OvertEmbeddedType [4]								Lexis
CLUcomposite [9]	Embed
MatrixArgStructure [2]	Embed [A1 V A2]

(115) Without overt marking:

RH-IDgloss [1563]	SOME	DEAF-AND-DUMB(HTHU	RATHER	HEARING.SPEAKING	HAVE-2H
LitTransl [162]	some deaf		(who) prefer hearing (child)		exist
ClauseLikeUnit(CLU) [160]	AMW2_c4a_A_F_40_NN_CLU#112		AMW2_c4a_A_F_40_NN_CLU#113		AMW2_c4a_A_F_40_NN_CLU#
RH-Arg [44]	nonA	A	V	A	V
RH-MacroR [20]		ACTOR	PROCESS	UNDERGOER	PROCESS
CLUwithinCLU [12]	pre-contained		contained		post-contained
OvertEmbeddedType [4]			Juxtaposition
CLUcomposite [16]	Embed
MatrixArgStructure [3]	Embed [A V] SpV
FreeTransl [27]	Yes, some deaf people who would prefer to have hearing children exist / Yes, there are some deaf people who would prefer to have hearing children.

3.2.2.5.1.1 The OvertEmbeddedType tier

The annotation on this daughter tier records the basis upon which the judgement of embedding has been made: lexis, juxtaposition (apposition), (visual) intonation, space (spatial placement). These corpus annotations allow for an evidence based and usage-based account of the nature of the relationships that are made and how each type of relationship is typically expressed, i.e., if it warrants being described as a formal constructional schema of the grammar. To date, lexis and juxtaposition appear to be the strategies most used with embedded clauses.

In complement embedded clauses, as in examples (111), (112) and (113), the indicator of embeddedness is found in the lexis of either the PRE-CONTAINED or POST-CONTAINED CLUs: YELL.SCREAM in (111), SAY in (112) and LOOK in (113). These and other verbs of locution, perception or cognition (such as THINK, BELIEVE, KNOW, etc.) are often (and some always) used transitively. This means they usually involve two participants: an entity who *says, perceives, thinks,* etc, and something which is *said*, or *perceived* or *thought*. The signs said, the thing perceived or idea thought may be expressed with a single sign (e.g., BOY YELL "WOLF", BOY SEE WOLF or BOY THINK "FUNNY") and is treated as an argument of a simple clause, i.e., it is not analysed as embedded in our schema (recall Section 2.2.2.2 above). Usually, however, these verbs of locution, perception or cognition take an argument which is a clausal complement (an embedded clause) as in the cited examples.

In modifying embedded clauses, as in example (114), there can also be lexical marking: the relativizer WHO marks the embedded clause which modifies the noun PERSON. However, it appears to be more common for there to be no overt marking of embeddedness with modifying embedded clauses: the modifying clause is simply uttered immediately after the noun, as in example (115). Less frequently a (visual) intonation contour is used to set the embedded clause off from the matrix clause, as in example (116), where raised eyebrows co-occur with the modifying clause.

(116)

Eye&Brow [3]					UP			
RH-IDgloss [169]	DOG	DSM(Bb):ANIMAL-HEAD-GO-IN	DSS(BC):OBJECT-SPHERICAL(jar)		FROG	BEFORE	DSM(BENT2):ANIMAL-I	GO
LitTransl [73]	dog (head)insert-into jar				(in-which) frog before located-inside-jar (then) jump-out			
ClauseLikeUnit(CLU) [73]	MSL_c7a_M_F_29_N_CLU#09				MSL_c7a_M_F_29_N_CLU#10			
RH-Arg [172]	A	V	nonA		A	nonA	V1	V2
RH-MacroR [121]	ACTOR	PROCESS			ACTOR		PROCESS	PROCESS
CLUwithinCLU [4]	pre-contained				contained			
OvertEmbeddedType [2]					Intonation			
CLUcomposite [67]	Embed							
FreeTransl [11]	The dog put its head into the jar in which the frog had been before jumping out.							

3.2.2.5.2 The CLUcomplex tier

On this tier one tags if a CLU is linked to another CLU. If two or more otherwise complete CLUs are joined together to form one larger complex construction then the relationship is made explicit on this tier.

If the relation is paratactic (a linking of two clauses of equal status) the first clause is tagged as INITIATING, and the second clause, the one that usually carries some marking of its relationship to the first, is tagged as CONTINUING. The following two examples use the additive conjunctions PLUS and AND, respectively:

(117)

Head [1]					NOD				
Eye&Brow [1]									
RH-IDgloss [158]	MAN	COWBOY(1)	COWBOY(1)		AMERINDIAN	DSM(1-VERT):HUMAN		PLUS	STAB
LH-IDgloss [106]		COWBOY(1)	DSL(1):THE-MAN-ST	COWBOY(1)	DSL(1-VERT):HUMAN	FBUOY:DSL(1-VERT):HUMAN			
LitTransl [62]	man cowboy person-at-there cowboy person-at-there				person-at-there amerindian person-at-here-behind-amerindian			and (he) stab (cowboy)	
ClauseLikeUnit(CLU) [52]	MDP_c9a_M_60_N_CLU#33				MDP_c9a_M_60_N_CLU#34			MDP_c9a_M_60_N_CLU#35	
CLUcomplex [7]					initiating			continuing	
OvertDependencyType [4]								Lexis	
CLUcomposite [44]	Single				Parataxis				
FreeTransl [22]	A cowboy stands here with an Indian behind him and the latter goes to stab the former. / An Indian is about to stab a cowboy in the back.								

(118)

RH-IDgloss [145]	DSM(1-VERT):HUMAN	ALWAY	DAY	DSM(1-VERT):HUMAN		AND	LITTLE	PT:	BOY	LITT	BECOME	LITTLE	BORING
LH-IDgloss [77]			DAY								BECOME		
LitTransl [33]	back-and-forward-he every day back-and-forward-he					and after-little-hile the boy little-bit become little bored							
ClauseLikeUnit(CLU) [39]	MDP_c2a_M_M_60_N_CLU#07					MDP_c2a_M_M_60_N_CLU#08							
CLUcomplex [3]	initiating					continuing							
OvertDependencyType [2]						Lexis							
CLUcomposite [4]	Parataxis												
FreeTransl [13]	Back and forth he went, every day, back and forth and little by little he became quite bored.												

The following uses the adversative (or contrastive) conjunction BUT:

(119)

RH-IDgloss [955]	FATHER	YOUNG	ALMOST	BUT	VERY	FS:MATURE		FOR.	PT:	FS:AGE
LH-IDgloss [513]	FATHER				VERY	FS:MATURE				FS:AGE
LitTransl [289]	(my) father young still				but very mature for his age					
ClauseLikeUnit(CLU) [291]	MBH_c5_M_M_49_N_CLU#47				MBH_c5_M_M_49_N_CLU#48					
CLUcomplex [48]	initiating				continuing					
OvertDependencyType [26]					Lexis					
CLUcomposite [251]	Parataxis									
FreeTransl [155]	My father was still very young (when he married), but he was mature for his age.									

If the relation is hypotactic (a linking of two clauses of unequal status) the CLU that carries the marking showing that it is depended on the other is tagged DEPENDENT, and the other CLU is labelled INDEPENDENT. In example (120) the dependent clause has a causal subordinating conjunction (WHY-BECAUSE) and in (121) the dependent clause has one of the conditional subordinating conjunctions in Auslan (PRETEND).

(120)

RH-IDgloss [1455]	STILL	WORRY	WHY-BECAUSE	PT:DET/LOC	FRIEND	PT:DET/LO	DEAF	COUNSEL
LH-IDgloss [702]	STILL	WORRY			FRIEND			COUNSEL
LitTransl [173]	(parents) still worry		because the-there (child's) friend, the-there (those) deaf, they-influence-it					
ClauseLikeUnit(CLU) [169]	STM_c4a_S_M_38_N_CLU#67		STM_c4a_S_M_38_N_CLU#68					
CLUcomplex [10]	independent		dependent					
OvertDependencyType [5]			Lexis					
CLUcomposite [15]	Depend							
FreeTransl [22]	The parents still worry because their deaf child's deaf friends will be an influence (and tempt the child to sign).							

(121)

Eye&Brow [2]						UP			
RH-IDgloss [1081]	PRETEND	HAVE	HAPPEN		PT:DET		WILL	GO-ON	PT:PRO2SG
LitTransl [184]	if have opportunity that						will just-do-it you?		
ClauseLikeUnit(CLU) [183]	MSQ_c4_M_M_28_N_CLU#150						MSQ_c4_M_M_28_N_CLU#151		
RH-Arg [185]	nonA	V		A		nonA			
RH-MacroR [42]									
CLUcomplex [29]	dependent						independent		
OvertDependencyType [14]	Lexis								
CLUcomposite [13]	Depend								
FreeTransl [24]	If the opportunity existed, would you take it?								

3.2.2.5.2.1 The OvertDependencyType tier

The annotation on this daughter tier is used to record the basis upon which the judgement of the existence of a clause complex has been made, namely: lexis, juxtaposition (apposition), (visual) intonation, space (spatial placement). The non-manual or visual prosodic markers of subordination usually involve raised eyebrows, increased eye aperture, and/or a raised chin/tilted back head, singly or in combination. Any one of these suggests the utterance unit is 'incomplete' and DEPENDENT on another which immediately follows (the INDEPENDENT clause). In addition, paratactically and hypotactically linked clauses may be articulated in contrastive locations in the signing space (e.g., left versus right, or high versus low). By identifying the meanings of each clause as they appear, and by making explicit which strategy has been used to indicate the relationship of clauses to each other, the way these types of relationships are typically expressed in Auslan can be determined.

In examples (117), (118) and (119) paratactic subordination is expressed lexically, but it could be expressed using other strategies. For example, in (122) the adversative meaning is achieved by visual intonation (the raised eyebrows, tagged as UP) and juxtaposition. In the adversative clause (which only consists of one sign) the raised eyebrows suggest surprise (i.e., the juxtaposed information is contrary to normal expectations).

(122) Paratactic (adversative, intonation)

Eye&Brow [2]	UP			UP	
RH-IDgloss [661]	M:HAVE	HOUSE	NOTHING-2H	TOW	
LH-IDgloss [304]		HOUSE	NOTHING-2H	TOW	
LitTransl [132]	(i) have home? no, not-at-all			(but) caravan	
ClauseLikeUnit(CLU) [85]	AAP_c3_A_F_51_N_CLU#69			AAP_c3_A_F_51_N_CLU#70	
CLUcomplex [2]	initiating			continuing	
OvertDependencyType [1]				Intonation&Juxtaposition	
CLUcomposite [5]	Parataxis				
FreeTransl [85]	I didn't have a house to live in, but lived in a caravan! (I didn't have a HOUSE to live in, but a CARAVAN.)				

Additive meanings using other strategies, however, are usually not as easy to identify. Simple clause coordination in Auslan is not as frequently explicitly coded with a manual sign as one might expect, especially given the potential influence from the ambient spoken language, English. Rather, coordination is often simply implied by contiguous clauses joined prosodically and/or articulated with two (or more) in distinct spatial locations. Often additive coordination may appear to be the best analysis of two juxtaposed clauses that logically constitute a sequence of events. However, the high frequency of verb-only clauses in Auslan (McKee et al. 2011; Hodge 2013; Ferrara & Johnston 2014; Johnston in press for 2019) can make it sometimes difficult to distinguish between single clauses with serial verb-like constructions, and coordinated clauses. Assuming both have a single prosodic contour, one can only apply semantic criteria to distinguish these: 'single complex event' suggests a serial

verb construction, 'two related events' suggests either a paratactic additive relation, or simply a real-world temporal unfolding of events.

In example (123), we see two sequential actions (*going to the tree by walking* and *pushing or pawing at the tree while barking*) expressed by two CLUs, each with a two verb sequence (serial verb construction) for each of the complex actions. Neither the two verb constructions nor the two CLUs are overtly marked with a conjunction (or any other way, ignoring sequence). It appears reasonable to say they there is no overt paratactic relation here, even if the most comfortable translation of the stretch into English would use one or more such conjunctions.

(123)

RH-IDgloss [320]	PT:	B	DOG	DSM(BENT2):ANIMAL-	WALK		PUSH		TREE.BUS	PUSH		SHOUT		PUSH	
LH-IDgloss [180]							PUSH		TREE.BUS	PUSH					
LitTransl [115]	the boy dog go-and-walk-there						(dog) paw-at tree paw-at-and-bark-and-paw-at								
ClauseLikeUnit(CLU) [115]	AAP_c7a_A_F_51_N_CLU#53						AAP_c7a_A_F_51_N_CLU#54								
RH-Arg [314]	non		A	V1		V2	V1		A	V1		V2		V1	
RH-MacroR [228]			ACTOR	PROCESS		PROCESS	PROCESS		UNDERGO	PROCESS		PROCESS		PROCESS	
FreeTransl [54]	So the boy's dog runs over to the tree with the hive in it, and pushes against it with his front paws, barking up at the bees. / So the boy's dog goes and runs to the tree with the hive in it, and pushes against it with his front paws and barks up at the bees.														
CLUcomposite [106]	Single						Single								
CLUcomplex [4]															
OvertDependencyType [2]															

In example (124), there is still no overt coordinator conjunction but the two clauses seem very tightly bound in sense (people usually come together at a table in order to eat), prosody (there is no discernible break between the clauses), and even perhaps spatially (the depicting sign DSL(5-VERT):HUMANS-IN-CIRCLE is articulated where TABLE had previously been signed). Thus, it appears reasonable to tag them as actually linked, citing juxtaposition, space and prosody as reinforcing this interpretation:

(124) Paratactic (additive & non-lexical) or simply two sequential events?

RH-IDgloss [168]	PERHAPS		NIGHT.STH		TIME		UNIT		SAME		TABLE		DINNER.STH	DSL(5-VERT):HUMANS-AT		FINISH.GOOD-2
LH-IDgloss [92]					TIME		UNIT		SAME		TABLE		FBUOY(B):TABLE	DSL(5-VERT):HUMANS-AT		FINISH.GOOD-2
LitTransl [51]	Maybe night-time group came together same table												(and we) dine all-around-table finish-completive			
ClauseLikeUnit(CLU) [52]	SVIAP_DPcruise_M_M_50_N_CLU#02												SVIAP_DPcruise_M_M_50_N_CLU#03			
RH-Arg [127]	nonA		nonA		nonA		V		nonA		nonA		V	nonA		nonA
RH-MacroR [5]																
CLUcomplex [9]	initiating												continuing			
OvertDependencyType [3]													Juxtaposition			
CLUcomposite [9]	Parataxis															
FreeTransl [20]	Perhaps at night, we would have all come together at the same table and we would have had dinner together. / Perhaps at night, we would have all come together at the same table. We would have eaten dinner together all around the table.															

The marked use of space is relatively infrequent, but when present it is often used to express alternatives, as in (125), where the head and body (and hence the arms and hands) lean rightwards during the articulation of the second CLU.

(125) Paratactic (alternative conjunction)

Head [2]							RIGHTWARDS			
Body [1]							RIGHTWARDS			
RH-IDgloss [955]	G(5-UP):WELL	PT:BUOY	PT:BUOY		FIX(B)	OFF-1H	FIX(B)		DSM(5-WIGGLE):SURFACE-CALMING-DOWN	
LitTransl [289]	well list-of-worries (i) fix-and-git-rid-of						(or i) fix-and-calm-down			
ClauseLikeUnit(CLU) [291]	MBH_c5_M_M_49_N_CLU#06						MBH_c5_M_M_49_N_CLU#07			
CLUcomplex [48]	initiating						continuing			
OvertDependencyType [27]							Space			
CLUcomposite [210]	Parataxis									
FreeTransl [155]	Well, as for my worries, I resolved them completely getting rid of them, or I fix them enough to just calm down.									
LH-IDgloss [513]	G(5-UP):WELL	LBUOY:ONE	LBUOY:FIVE		FIX(B)	FBUOY:FIX	FIX(B)		DSM(5-WIGGLE):SURFACE-CALMING-DOWN	

With respect to hypotactic dependency, in examples (121) and (120) the identification of this relationship was based on lexis: the subordinating conjunctions (WHY-BECAUSE and PRETEND) mark the one of the clauses as a dependent subordinate clause. However, the expression of

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this relationship could be achieved by intonation or juxtaposition instead, as in the following example with the raised eyebrows on the dependent conditional clause (the protasis).[32]

(126) Hypotactic (conditional, intonation only)

Eye&Brow [1]	UP			
RH-IDgloss [119]	PT:PRO1SG	SICKIE	STOP-2H GO-HOME	G(5-AWAY):HANDS-OFF RISK
ClauseLikeUnit(CLU) [21]	SVIAP_DHsickie_P_F_48_NN_CLU#13		SVIAP_DHsickie_P_F_48_NN_CLU#14	SVIAP_DHsickie_P_F_48_NN_CLU#15
RH-Arg [0]				
RH-MacroR [0]				
LitTransl [23]	(if) I sickie		(I) stay home	(because) well-hey too-risk
CLUcomplex [3]	dependent1(independent2)		independent1(ndependent2)	dependent2
OvertDependencyType [2]	Intonation			Juxtaposition
CLUcomposite [1]	DependDepend			
FreeTransl [22]	If I take a sickie, then I'll stay home because hey it's too risky (i.e., being caught).			

The third CLU in example (126) is also an example of non-lexical hypotactic subordination, but this time it is merely juxtaposed to the previous two CLUs which consist the independent unit for this dependent clause of reason. The annotator feels that in context the signer is definitely giving a reason why she would stay home next time when she's supposed to be sick, i.e., *because* it's too risky. However, the tag JUXTAPOSITION clearly indicates that context is really the only reason for this interpretation. When quantifying the types of clausal relationships and their coding strategies identified in the Auslan Corpus, it is then possible to compare and contrast subordinate clauses of reason that are overtly marked and those that are not. Only if the latter appear to be very frequent in the language would it deserve to be noted. After all, it is possible to say in English *If I ever take a sickie again, then I'm going to stay at home. It's really too risky.* The final sentence *It's really too risky* is understood to be giving a reason. Causality is not expressed in the lexico-grammar in this case, even though we know that English speakers are probably more likely to encode the relationship: *If I ever take a sickie again, then I'm going to stay at home, because it's really too risky.*

Finally, as can be seen from the annotations in (126), the juxtaposition creates a complex dependency which tagged on the CLUcomposite tier in the example as DependDepend. The next section explains the types of tagging on the CLUcomposite tier.

3.2.2.6 The CLUcomposite tier

The type of large complex sentence created by embedding or linking is annotated on the CLUcomposite tier.

A complex sentence that consists of a CONTAINED clause and a matrix clause is labelled EMBED. (Recall that the matrix clause could be PRE-CONTAINED+CONTAINED, CONTAINED+POST-CONTAINED, or PRE-CONTAINED+CONTAINED+POST-CONTAINED.)

A complex sentence that consists of two clauses paratactically linked (INITIATING+CONTINUING) is labelled PARATAXIS; and one consisting of two clauses hypotactically linked (INDEPENDENT+DEPENDENT, or DEPENDENT+INDEPENDENT) is labelled DEPEND.

Complex sentences may even display more than one type of complexity such as multiple nested types of embedding or linking. Double embedding is labelled EMBEDEMBED and double dependency is labelled DEPENDDEPEND (see example (126)); mixed multiple nested types are labelled EMBEDDEPEND when the first unit is an EMBED-type, as in: *The boy thought*

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[32] In Australian English a 'sickie' is a day one takes off work for illness, especially if one is not actually sick. The narrator has been talking about her experience of being seen at a shopping mall by her boss when she was supposed to have been at home sick.

"If I sound the alarm, the villagers will all come running." or DEPENDEMBED when the first unit is a DEPEND-type, as in: *"If I sound the alarm, the villagers will all come running." the boy thought*. Though they are relatively rare, very complex sentences of yet greater levels of nesting exist and they can be annotated by further expansion using the same logic: EMBEDEMBEDEMBED (*The hare thought that the tortoise, who he couldn't see, was behind him*), DEPENDDEPENDDEPEND, EMBEDDEPENDEMBED, DEPENDEMBEDDEPEND, and so on. The use of the CLUcomposite tier can be seen in examples (113)-(126).

Identifying sentence complexity on a dedicated tier means it is simpler to extract information about clause patterns from the corpus. The CLUcomposite tier tags can be compared to the aligned CLUwithinCLU and OvertEmbedType tiers or the CLUcomplex and OvertDependencyType tiers to quantify the distribution of lexical versus non-lexical strategies in creating complex sentences. Consequently, in order to account for all the data, simple clauses and non-clauses must also be identified on this tier.

Simple clauses 'stand-alone' as utterance units. They are not linked to or embedded in another contiguous clause. Of course, within a text or discourse clauses are related cohesively anyway, through topic maintenance, referential chains, lexis and register, so in sense in a multi-clause utterance no clause really stands alone at all. It is just that they are stand-alone when compared to the complex sentences in which there is overt linking. Simple clauses are tagged as SINGLE on the CLUcomposite tier.

Finally, all other CLUs such as interactive gestures, exclamations, backchannels, and salutations (essentially 'non-clauses') are tagged as FRAGMENTS.

Table 25: Summary of clause complexity tags

Utterance type				CLUcomposite tier annotation	Clause Complexity annotation
Fragment (interjections, salutations, exclamations, etc.)				**FRAGMENT**	**N/A**
Clause-like unit (CLU)	Simple clause (simple sentence)			**SINGLE**	
	Complex sentence				**CLUcomplex tier annotation**
		Clause complex (linked)	hypotaxis (unequal status)	**DEPEND**	**INDEPENDENT**
					DEPENDENT
			parataxis (equal status)	**PARATAXIS**	**INITIATING**
					CONTINUING
					CLUwithinCLU tier annotation
		Complex clause (embedding)	*Argument* of matrix clause	**EMBED**	**PRE-CONTAINED**
					CONTAINED
			modifier of argument of matrix clause		**POST-CONTAINED**

4   Tertiary processing

Annotating digital video SL corpora in the ways outlined above mean that it is possible to search and sort the primary and secondary annotations to extract information, such as frequency characteristics or co-occurrence patterns. This information can then, in turn, be added to the corpus, e.g., by way of additional tags to existing ID-glosses or CLU annotations, to enrich it further and make possible further more sophisticated analyses taking these values into account.

Future developments in ELAN functionality are likely to make this much simpler to do. For example, it should be possible soon to create annotations based on 'overlapping values' on existing annotation tiers. Thus, researchers will be able to specify that when annotations overlap (with or without specifying what the value in those annotations must be) on tiers W, X, and Y, a new annotation should be created on tier Z (and then even specify an annotation or tag that should be automatically inserted into the newly created field). Using this technique, the corpus itself can be enriched in ways that would be impossible for a human to code in any reasonable period of time.

Other developments, such as the ability to launch a second query on a found set, the ability to create annotations that tag the results of a found set in a search routine, or the ability to delete empty annotations once found, all promise to make it possible to extend tertiary processing in new and extremely productive ways. (Some of these operations can already be dome by exporting annotations into databases such as Excel.)

4.1.1   Merge tiers & regular expressions

One operation in tertiary processing involves aggregating annotations distributed over more than one tier into a one large concatenated annotation on a single tier. If particular annotations are merged in each annotation file, it becomes possible to search across the entire corpus for types of constructions. Consider, for example, the following two CLUs.

(109)

(110)

From looking at the annotation and tagging, it can be seen that though both clauses use the verb EAT transitively with two overtly expressed arguments (RAM and GRASS, and SHEEP and WOLF) their argument positions are reversed when we consider their semantic roles in the clause. This becomes obvious when we look at the tiers that are the result of the merge operation. For instance, tiers #4 and #8 have been created by merging and concatenating relevant annotations and tags on other tiers. Specifically, #4 has been created by merging IDgloss, GramCls, Arg, MacroR and SemR with an empty CLU delimiter; and # 8 by similarly merging Arg, MacroR and SemR. This is done in a single operation across the entire corpus (*File > Multiple file processing > Merge tiers…*).

In terms of argument position by constituent roles we can see in Tier #4, for example, that we have [[A1 ACTOR AGENT] [V PROCESS ACTION] [A2 UNDERGOER PATIENT]] for the first example (RAM EAT GRASS), and [[A1 PATIENT UNDERGOER] [V PROCESS ACTION] [A2 ACTOR AGENT]] for the second example (SHEEP EAT WOLF). These aggregated and concatenated CLU-related annotations can now be the subject of single or multiple tier searchers. For example, one can now use regular expressions to search on a single tier (e.g., either #4 or #8) across the entire corpus for different constructional schemas. For example, one could search for an argument pattern in which the AGENT precedes the VERB and the PATIENT follows it. One possible regular expression for such a search is *.+?AGENT.+?PROCESS.+?PATIENT*. For a search for a CLU in which the PATIENT precedes the VERB and the AGENT follows it, one possible regular expression is *.+?PATIENT.+?PROCESS.+?AGENT*. Such CLUs are, by default, transitive.

One may also conduct multi-tier searchers, exploiting the richer information in merged tiers with tags on other tiers. For example, one may search for transitive clauses (tagged "t") which overlap a CLU annotation in #4 or #8 in which only a single overt argument appears (an "A", rather than an "A1" or an "A2") and in which that "A" is either an ACTOR or an AGENT or an UNDERGOER or a PATIENT, as well as being before or after the VERB.

One may even identify and quantify some of the environments in which elided arguments (in either transitive or intransitive CLUs) appear. For example, one may search for transitive or intransitive clauses which overlap a CLU annotation in tiers #4 or #8 in which only a single overt argument appears ("A") or no overt argument appears at all (no "A") and which also overlap a period of constructed action, a verb which has been spatially modified, or a depicting verb.

Similarly, merged tiers, along with other tiers, can be exported from ELAN into EXCEL and various filters turned on and off in the resulting spread sheet to do a similar type of analysis to that described above.

A note on merging tiers Always back up your corpus files before doing this type of multi-file processing. Work on a copy of the corpus files. Re-create the merged tiers before doing another or repeated analysis. The simple reason is that the corpus is always subject to revision and as a consequence merged tiers can quickly become out of date. (Indeed, merging itself is a very good way to spot errors in the annotations which should then be corrected.) It will

never take more than a couple of hours to create a fresh merged set, depending on the number of tiers to be merged and the number of merge-tiers to be created.

A note on weak hand signs and/or switches in hand dominance Tier merging described above is straightforward when there is no simultaneous sign on the weak hand or any switch in hand dominance, i.e., the signer uses their weak hand to articulate a sign instead of the strong hand. Conveniently, most signers appear to be consistently dominant with either their left or right hand, and the majority of core arguments involve the strong hand irrespective of whether the manual sign is one-, two- or double-handed. The true simultaneous articulation of two core arguments using lexical signs appears to be less frequent than once thought. Consequently, the vast majority of CLUs are correctly concatenated using merge in that the resultant string accurately reflects sequential organization of constituents. However, independent, or the simultaneous and independent, use of one's weak hand does occur and this thus complicates the concatenated constituent string, i.e., two simultaneous articulations, if each is given core constituent status, appear sequentially, not simultaneously in the merged tier. When simultaneity of this type does occur, it is much more likely to be a depicting sign (DS) or one of the hands is articulating a pointing sign (PT). When this fact is combined with the fact that distinctive CVs are used for the left (weak) hand arguments—they are bracketed with { }—and overt CA arguments—they are bracketed with [ ] (see §8.2.1.1.1 and 8.2.1.1.3) — it becomes relatively easy to identify these cases in the merge output by the presence or absence of { } or [ ] arguments in the string. They can then be inspected and dealt with.

However, even without inspection, one knows that, by definition CA arguments are always simultaneous with a contiguous manual articulation in the merge string. Weak hand arguments, by contrast, may be either simultaneous with, or sequential to, a contiguous manual articulation on the strong hand in the merge string. Nonetheless, we also know that if these arguments are a {PT} or a {DS}, in the majority of cases they can also be assumed to be simultaneous articulations. Inspection quickly resolves the issue if overall frequency is being measured.

4.1.1.1 Grammatical (syntactic) relations

The multi-tier search routines sketched above can also be used to derive tags for argument construction types, and thus identify those that are attested and their frequency. This, in turn, helps empirically ground any claims as to whether grammatical (aka syntactic) relations underpin and explain these constructions, as they often do in a language. As we have seen, the clause lies at the heart of the notion of the grammar of languages: the type, form, presence and order of the core and non-core constituents in clausal constructions often pattern in one of two major ways with respect to transitive and intransitive clauses in terms of the way in which agent-like arguments and patient-like arguments in transitive clauses align with the single argument of an intransitive clause.

One is the accusative pattern, the other is the ergative pattern. Amongst other phenomena, one key symptom of patterning is that in an accusative language the agent-like

argument in a transitive clause is treated "the same" in the grammar as the single argument of an intransitive clause as English does in transitives clauses such as *Fred/he hit John/him* and intransitive clause such as *Fred/he ran away*. This can be manifested in morphology (*he* versus *him*), obligatory presence (not _ *hit John/him* nor _ *ran away*) or obligatory interpretation of an elided argument (*Fred/he hit John/him and _ ran away* where _ = *Fred/he*), or word order (not *hit John/him Fred/he*, nor *ran away Fred/he*), alone or in various combinations.

In an ergative language, on the other hand, the patient-like argument of a transitive clause is treated "the same" in the grammar as the single argument of an intransitive clause, e.g., it is as if the English transitives had this form (as they do) *Fred/he hit John/him* and had these intransitive forms (as they do not because we are using a pseudo-English invented for the purposes of illustration) *John/him fell over*, *Her felt sick*, *Them resigned*, and so on. Like the accusative pattern, the ergative pattern is manifested in morphology, obligatory presence of certain arguments, obligatory interpretation of elided arguments, or word order. These can be difficult to contrive in understandable pseudo-English examples, but we have already given one for morphology (*Him fell over*, *Them resigned*) in which pseudo-ergative-English would use *him* not *he* for the single argument of an intransitive. Another example would be the obligatory interpretation of an elided argument: if one said in pseudo-ergative-English *Fred/he saw John/him and _ fell over* it would mean that *John/him fell over*, and not that *Fred/he fell over*.

To understand these alignments and the environments which appear to condition them we need to distinguish the arguments in a transitive clause from the one in an intransitive clause. So what are coded as A (or A1, A2, A3 etc. in simple argument tagging) need to be tagged for their specific role in transitive or intransitive clauses, as in the following table.

Table 24 Transitivity and argument-type

Transitivity	Argument-type tag	Explanation	Examples
Transitive			
	A	Agent-like argument	SHEEP EAT GRASS (A V P)
	P	Patient-like argument	EAT GRASS SHEEP (V P A) GRASS EAT SHEEP (P V A) SHEEP GRASS EAT (P A V)
Intransitive			
	Sa	Single agent-like argument	SHEEP GRAZE (Sa V) GRAZE SHEEP (V Sa)
	Sp	Single patient-like argument	BOY FALL (Sp V) FALL BOY (V Sp)

Tertiary processing can capture these alignments by multi-tier searching where simple CLU argument structure constructions (A V, V A, A1 V A2, etc.) are aligned with CLU transitivity tags and the constituent role in the clause of these arguments (ACTOR-UNDERGOER, AGENT-PATIENT, EXPERIENCER-SOURCE, etc.).

4.1.2 The frequency tier

ELAN is able to search across multiple annotation files to produce frequency statistics for annotations and hence ID-glosses. When exported into database or concordance programs signs can thus be assigned to frequency groups (e.g. very high, high frequency, middle, low, hapax) based on these statistics. Frequency information can then be considered as a

variable in the analysis of sign behaviour. However, this information can itself be entered into ELAN as a tag on the frequency tier. This then enables multi-tier, multi-file searches in ELAN to use frequency itself as a constraint.

4.1.3   The CA co-occurrence tier

This tier assigns tags to signs on the basis of whether they occur during a period of CA. Once tagged, this value can be added as a constraint in multi-tier, multi-file searches to identify signs that meet or do not meet the criteria relevant to the research question at hand (e.g. are modified or not modified, are in a CLU with an overt 'subject' or without an overt 'subject', and so on).

5   Summary

Annotation occurs in three phases (primary, secondary and tertiary processing). The conventions for primary annotations were discussed first. This was followed by the schema and conventions for secondary annotations and tagging. Secondary annotations can be added to the manual sign units identified in primary processing. They may describe non-manual behaviours, role shift, and CA. These types of secondary annotations can also be added to larger utterance units such as CLUs. The CLU-based literal translations is a type of secondary annotation. Finally, the types of annotations used in tertiary processing were discussed.

Table 26 The three levels of corpus processing in brief

Primary processing	Secondary processing	Tertiary processing
Segmentation, tokenization & translation: ID-glossing, parallel free translation	*Sub-categorization of constructions signs, utterance units, & constituency:* part of speech, constituency in phrases, clauses; clause complexes, depictions, clause-based literal translation, etc.	*Incorporation of information derived from the co-occurrence of various values from primary and secondary processing into tags inserted into the corpus:* frequency tagging, construction type tagging, etc.

6 Appendix: Handshape codes that can be found in some annotations

The most likely handshapes requiring specification in gloss annotations are shown in Table 27. This is only a subset of handshapes in Auslan. The handshape table is based on the Auslan handshape order used to sequence signs in the second edition of the Auslan dictionary (Johnston 1998). They are sequenced according to the Auslan number (shown on grey rows) that the handshape is used in or most closely resembles, usually in terms of extended figures. (For further details regarding the distinctive handshapes of Auslan and their ordering see Johnston 2001; Johnston & Schembri 2007.) No claim is being made that this particular Auslan handshape order is relevant to any other SL. For the precise specification of handshapes, as part of phonetic or phonological transcription I recommend one use the Hamburg Notation System (HamNoSys).

Table 27 Codes for the approximate identification of major handshapes.

0	0	0	0	0	0	0	1	1	1
O	FLATO	E	F	FLATF	FLATFC	FC	1	D	X
2	2	2	2	2	2	2	3	3	3
2	BENT2	P	H	HTHUMB	N	R	3	BENT3	CLAW3
3	3	4	4	5	5	5	5	5	5
M	M1	4	BENT4	5	BENT5	B	BB	BENTB	FLATBC
5	5	6	6	6	7	7	7	7	8
BC	CURVEDB	6	I	BENTI	7	BENT7	GC	GCFLAT	8
8	10	10	10	11	11	12	11	…	…
BENT8	S	IRISHT	IRISHK	GO	FLATGO	12	HCFLAT	MID	!
…	…	…							
Y	ILY	IRISHH							

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