LUND UNIVERSITY

The language of vision in four Aslian speech communities:

An introductory investigation of basic vision verbs

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Fall semester, 2020

Abstract

Vision is often considered to top the hierarchy of the senses, reflected for example in the high relative frequency of vision verbs, in comparison to other perception verbs. Results from some previous studies, however, have shown that there is greater cross-linguistic variation concerning perception language than previously thought, emphasising other sense modalities than vision. This thesis conducts a first investigation of the domain of vision in the Aslian languages of the Malay Peninsula, a group of speech communities known for their cultural and linguistic elaboration of olfaction, by analyzing lexical and structural contexts of basic vision verbs in specialized narrative-based spoken corpora from four of these languages (Jahai, Ceq Wong, Semaq Beri, and Semelai). The results suggest a dominance of basic vision verbs in all of the languages, but also some cross-linguistic variation as to the semantic characteristics of the verbs. Notably, neither vision metaphors, which some consider to be universal, nor clear-cut cases of polysemous structures are present in the data. Possible explanations for these results, as well as ideas for further research concerning perception language in the Aslian language setting are discussed. The high frequency of vision verbs, even in languages with a focus on olfaction, highlights the universal importance of vision.

Keywords: language of vision, hierarchy of the senses, sensory linguistics, universal perception, language of perception, Aslian languages, Jahai, Ceq Wong, Semelai, Semaq Beri

Acknowledgements

First and foremost, I would like to thank my supervisor Niclas Burenhult for first sparking my interest in Jahai during a lecture back in 2019, and for a year later reintroducing me to the Aslian language family. I am incredibly thankful both to him, and to my co-supervisor Nicole Kruspe, for their valuable input, insightful comments, and their patience. Without their help, this paper would not exist.

I would also like to thank my friends and my family for patiently listening to my ongoing monologues about the world of perception verbs. For their encouragement, feedback and most importantly, for their honest attempt to hide their faces of confusion, I am immensely grateful.

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1 Introduction

Humans everywhere gather information about the world through seeing, hearing, feeling, smelling and tasting. The foundation of all of our knowledge stems from, is acquired through, or based on perception in some way (cf. Cassam, 2008), making the field a popular one to study within many academic disciplines, for instance linguistics and cognitive sciences. This study aims to provide an overview of how words within the perceptual domain, particularly vision verbs, such as *looking* or *seeing*, are used by speakers of four Aslian languages in the Malay peninsula.

Humans have a natural tendency to categorise phenomena in the world. If we have identical bodies with which to gather information and interact with the world, one could then assume that we conceptualize and systematize perception in similar ways. This is, however, not the case. Despite the universal similarities of how our bodies interact with the world, there are tremendous cross-cultural and cross-linguistic differences in the ways of how we talk about perception. Speakers of some languages only make lexical distinction between vision and 'non-vision' (Ritchie, 1991; van Putten, 2020), while other languages with extremely rich and complex perceptual vocabularies have different words for describing vision based on the semantic roles of the subject (e.g. ACTOR or EXPERIENCER), the size or shape of the perceived object or the direction of the gaze (Aikhenvald & Storch, 2013; Viberg, 1983).

Vision holds a special position in human cognition. This is reflected in the high frequency of vision verbs or references to vision in language, semantic extensions and polysemous structures, as well as proposedly universal cognitive mappings connecting VISION with COGNITION (Grady, 1997; San Roque et al., 2015). An influential cross-linguistic study conducted by Viberg (1983) claims that vision tops the universal hierarchy of the senses, due to the reasons mentioned above, a claim which for a long time was supported by results from numerous studies. Recently, however, it has received criticized (Ibarretxe-Antuñano, 2008).

Instead, *culture* seems to play an important role in the conceptualization of perception, as has been shown in a growing body of research scrutinizing proposed universal tendencies (Caballero & Paradis, 2015; Ibarretxe-Antuñano, 2008, p. 25; Majid & Levinson, 2011). Even though "[vision] seems to provide a basis for shared public knowledge" (Tran, 2016, p. 6), some languages favour audition over vision in terms of semantic extensions. For instance, some Australian languages tend to frame UNDERSTANDING in terms of HEARING, instead of the previously argued VISION, which is more closely connected to the "domain of social interaction", sexual attraction and desire (Evans & Wilkins, 2000, p. 576). The motivation for

semantic extension of perception words is influenced by social (Classen, 1993; Howes, 2003) or environmental (Feld, 1990; Gell, 1995) factors. Evans and Wilkins (2000, pp. 581-585) list six cultural factors behind the importance of audition in some languages spoken in Australia, below summarized by Ibarretxe-Antuñano (2008, pp. 26-27):

> "[…] (i) the role of individual choice in selectively directing attention in hearing, (ii) a non-dyadic or broadcast conversational style, (iii) different prototypes for perceiving objects absent from the immediate scene, (iv) accumulation of relevant knowledge about the country, land, tracks, myths [...] by hearing, (v) the role of hearing in the socialisation process, and (vi) oral tradition"

The importance of culture is by no means a new addition to the study of sensory language. Wober already discussed anthropological aspects of metaphorical extensions of perception verbs in 1966, arguing that highly typographic or chirographic cultures to a higher extent make use of VISION-COGNITION mappings than languages reliant on oral communication (Wober, 1966 cited in Ritchie, 1991, pp. 192-193).

Research on tendencies and patterns of perceptual language has drawn attention to the Aslian languages, members of the Austroasiatic language family spoken in the Malay Peninsula, which display an unexpected focus on the chemical sensory modality olfaction (Burenhult & Majid, 2011; Majid & Burenhult, 2014; Majid, Burenhult, Stensmyr, de Valk & Hansson, 2018; Majid & Kruspe, 2018; Wnuk & Majid, 2012). Contrary to the idea that humans lack the ability to talk about smell in abstract terms, some Aslian languages display an elaborate and, most importantly, abstract lexicon of smell words, similar to abstract color terms in many other languages. The sensory modality of smell is not the only linguistically complex perceptual modality of Aslian languages. Many monomorphemic lexical items in some of these languages encode spatial properties of vision, such as the direction of gaze, or in some cases even the shape of the perceived object (Kruspe, personal communication, Sep. 24, 2020; Wnuk, 2016, p. 144).

A more thorough investigation of what role vision plays in these languages has, however, not yet been carried out, with the exception of a paper on perception verbs in 13 languages around the world, which includes the Aslian language Semai (San Roque et al., 2015), as well as an overview on Maniq perception verbs by Wnuk (2016). It would provide a deepened understanding of the complexity of the perceptual hierarchy and put the Aslian emphasis on

olfaction into a broader linguistic context, as well as add to the discussion on the universal importance of vision in relation to other sense modalities.

This study will therefore focus on the language of vision in the four Aslian languages Jahai, Ceq Wong, Semelai and Semaq Beri, a sample of languages whose distribution of culture and language-genealogical relationships also allows for an investigation of how genealogy and social environment may impact the structure of the visual domain. Jahai and Semaq Beri are spoken by hunter-gatherers. Semelai and Ceq Wong speech communities display a mix of cultural features and subsistence modes. Jahai and Ceq Wong belong genealogically to a branch of the Aslian languages known as Northern Aslian, while Semaq Beri and Semelai belong to a branch known as Southern Aslian (Benjamin 1985).

2 Theoretical background

In this section, the theoretical background will be described, starting with an introduction of the sensory modality of vision. This will be followed by a discussion on the linguistic approach to perception, as well as a brief overview of the Aslian languages, which will then be the focus of the rest of the thesis.

2.1 The complexity of vision and perception

Vision is by far the most studied sensory modality, due to its complexity and importance in human cognition (Gerrig & Zimbardo, 2008; Kandel et al., 2000; Pike et al., 2012). The retina of the human eye is packed with approx. 120 million photoreceptor cells, all of which respond to information in a specific receptive field and "transduces light into neural activity" (Kolb, Whishaw & Teskey, 2016, p. 289). The registration of the physical stimuli which the photoreceptors encounter is called *sensation*. *Perception*, on the other hand, is the results of our own interpretations of these sensations.

Some argue that the perceptual process is influenced or even determined by the sociocultural environment of a person (Chua, Boland & Nisbett, 2005; Kitayama et al., 2003, p. 206; Kitayama, Duffy, Kawmura & Larsen, 2003; Nisbett & Miyamoto, 2005) or language (Rhode, Voyer & Gleibs, 2016), and while more extensive research needs to be carried out on this topic, it is safe to assume that perception is a highly subjective experience.

By moving our eyes and our body, we can extend and alter the scope of the receptive field, allowing us to focus on salient objects allocated in the center of our spatial attention. Although visual perception and spatial attention are tightly integrated, the latter does not necessarily

entail subjective awareness of the object present in the receptive field (Baier, Goller & Ansorg, 2020; Lamme, 2003; Wyart & Tallon-Baudry, 2008). The neural processes underlying visual perception are still debated by many, much like the question concerning linguistic expressions related to vision and perception between the two linguistic camps of universalists and relativists.

2.2 Talking about vision

The debate on linguistic relativity versus universalism reached the field of perception through an argument on color perception, and how cross-linguistic differences might provide valuable insights on the interaction between language and cognition. A radical relativist believes that "semantic distinctions in languages [are] determined by largely arbitrary linguistic convention" and that "semantic differences cause corresponding cognitive or perceptual differences in speakers of different languages" (Regier, Kay, Gilbert & Ivry, 2010, p. 165). Universalists, on the other hand, claim that humans share cognitive abilities, which are impervious to linguistic influence. In short, the lexicalization of color terms can still vary across languages and culture, but the underlying cognitive abilities are expected to be the same (Saeed, 2016, p. 72-73). The debate between universalists and relativists has since then tried to resolve questions regarding the impact of language on perception, or vice versa, and, perhaps most importantly, the question of a universal ranking of the human senses.

2.2.1 The hypothesis of vision dominance

In his overview on the typology of perception verbs, Viberg (1983; 2001, p. 1296) proposes a universal lexical field of perception verbs, comprising 15 basic meanings, shown in Table 1 below. The universality of the lexical semantic field can be traced back to the general means through which humans experience the world, namely seeing, hearing, touching, tasting and smelling. In addition to establishing the lexical field, Viberg suggests that vision tops the hierarchy of perception, after comparing typological patterns of polysemy, morphological marking and cognates of basic vision verb in a set of 53 languages (1984, p. 137). This hypothesis is known as the *hypothesis of vision dominance.* Sweetser (1990) argues that its explanation is the crucial role of the vision when familiarizing ourselves with our surroundings.

San Roque et al. compared the frequency of different perception verbs in a diverse set of languages (2015) and found that the universalist hypothesis of vision dominance was applicable to all of the 13 languages in their study. The rank of the remaining senses, however, varied across cultures. This pointed towards a more relativist view of the ranking of perception

modalities. There is research supporting both linguistic universalism and relativity, suggesting a language-thought interface of greater complexity than either one of the approaches can attest to (Regier, Kay, Gilbert & Ivry, 2010).

Table 1: Viberg's paradigm and corresponding English perception verbs[1]

	Experiencer-based		**Source-based**
	Activity	**Experience**	
SIGHT	to look	to see	to look (e.g. 'it looks')
HEARING	to listen	to hear	to sound ('it sounds')
TOUCH	to feel	to feel	to feel ('it feels')
TASTE	to taste	to taste	to taste ('it tastes')
SMELL	to smell	to smell	to smell ('it smells')

2.2.2 Perception language and the conceptual metaphor theory

Perception verbs are also important in many metaphor studies (for an overview, see Speed, O'Meara, San Roque & Majid, 2019). Ortony (1979), and later Lakoff and Johnson (1980) reintroduced metaphors as a natural part of how humans conceptualize the world, arguing that humans make use of cognitive cross-domain mappings, based on schematic similarities, around which metaphors of each language are organized, such as HAPPINESS IS UP (yielding conventional expressions, such as 'I'm feeling a bit down today' or 'I'm walking on air') or the typical example LOVE IS A JOURNEY ('Their relationship isn't going anywhere' and 'They've come so far') (Lakoff & Johnson, 1980). Linguistic expressions reveal the underlying cognitive mappings connecting concepts and domains in a systematic way. The theory is named Conceptual metaphor theory (CMT).

CMT is often associated with the idea of *grounded cognition*, namely that mental imagery and linguistic processing are grounded in our bodily experience and perception of the world (Barsalou, 2008; Kemmerer, 2019). Embodiment is also the reason as to why some of these mappings are found in a majority of the world's languages. All humans perceive and interact

[1] It is important to note that there is great linguistic diversity regarding how the slots in the perception paradigm are filled. For example, Avatime, a Niger-Congo language, makes a binary lexical distinction, with one verb denoting vision and another denoting hearing/touching/tasting/smelling (van Putten, 2020), while other languages use one lexical item which encompasses both activity, experience and phenomenon-based words.

with the world in essentially the same way, and therefore abstractions can be thought of in terms of concrete, body-related ideas and image schemas.

Speed et al. (2019, p. 9) state that "[m]etaphor is assumed to be a universal feature of human language". Some scholars even claim that the underlying mappings, which manifest themselves in metaphorical conventional phrases, are universal. Grady (1997), for instance, presented a list with so called 'primary conceptual metaphors', basing their claimed universality on embodiment. Previous research investigating the cognitive mappings connected to the domain of PERCEPTION has pointed towards a universal tendency to talk about COGNITION in terms of VISION. 'I see' is a highly conventional way to express one's understanding of a topic in English, as is the phrase 'to become clear', which also illustrates the connections between UNDERSTANDING and VISION, providing us with the metaphor UNDERSTANDING IS VISION.

This body of research has, however, been criticized for its ethnocentric approach and blindness to cultural factors that may in fact play a crucial role (Ibarretxe-Antuñano, 2008). Typographic and chirographic cultures seem to have stronger metaphorical VISION-UNDERSTANDING mappings, whereas other languages with a greater focus on oral communication instead might link UNDERSTANDING with AUDITION (Wober, 1966 cited in Ritchie 1991, pp. 192-193). Evans and Wilkins observed this in several Australian languages, for instance Kayardild, a language in which the word for understanding (*maralmilla*) is a direct semantic derivative of the word *ear (marral-)* (Evans & Wilkins, 2000, p. 566), lit. 'smart, having a good ear'. A new mapping was proposed by Ibarretxe-Antuñano (2008): UNDERSTANDING IS PERCEPTION. Since humans are thought to gather information about their direct environment through perceiving it, this metaphorical mapping is less controversial than UNDERSTANDING IS VISION**,** as it takes cross-cultural differences into consideration, while not necessarily neglecting the importance of vision. It is more general, and hence more inclusive.

Perception metaphors are traditionally divided into three subcategories: Transfield I, Transfield II and Intrafield, see Table 2. Transfield I and II are metaphors with PERCEPTION as *either* source or target domain, respectively, while Intrafield-metaphors are metaphors where *both* source and target domain are located in the domain of PERCEPTION, such as "sour note" (O'Meara, Speed, San Roque & Majid, 2019, p. 3).

Table 2: Type of perception metaphors, (from O'Meara, Speed, San Roque and Majid, 2019, p. 3)

	Source domain	**Target domain**	**Example**
Transfield I	perception	other	jangling nerves
Transfield II	other	perception	high voice
Intrafield	perception	perception	sour note

In line with the idea of grounded cognition and the importance of bodily experience in CMT, a majority of perception metaphors can be expected to express directionality from concreteness to abstraction. UNDERSTANDING IS PERCEPTION belongs to this category (Transfield I), since PERCEPTION makes up the source domain, as opposed to the target domain (O'Meara, Speed, San Roque & Majid, 2019). However, there are numerous languages where Transfield II and Intrafield-metaphors within the domain of PERCEPTION have been found (Anderson, 2019; Kövecses, 2019).

2.3 Aslian languages

Ever since the focus on olfaction in the Aslian languages was brought to light in Burenhult & Majid (2011), few articles on the language of perception fail to mention this language family. The Aslian languages, spoken in the Malay Peninsula, belong to the Austroasiatic language family (Benjamin, 2012). They are generally divided into three subbranches, namely Northern, Southern and Central Aslian languages (Benjamin, 2012; Dunn, Burenhult, Kruspe, Tufvesson & Becker, 2011). Northern Aslian languages are spoken by the Semang (Ceq Wong being an exception), an ethnographic group of previously nomadic foragers who live in groups of about 15-50 people. Although some people are still nomadic, many have also settled down permanently (Burenhult, 2020, p. 169). The Southern Aslian languages are typically associated with Aboriginal Malay societies of collectors-traders and swidden agriculturalists (Burenhult 2020, p. 167). The speech communities follow a settled, nomadic or semi-nomadic lifestyle in individualistic, egalitarian societies (Kruspe, 2004, p. 23; Kruspe, Burenhult & Wnuk, 2015, pp. 421-422; van der Sluys, 1999, cited in Burenhult, 2005). The geographical location of the Aslian languages is shown in Figure 1 below.

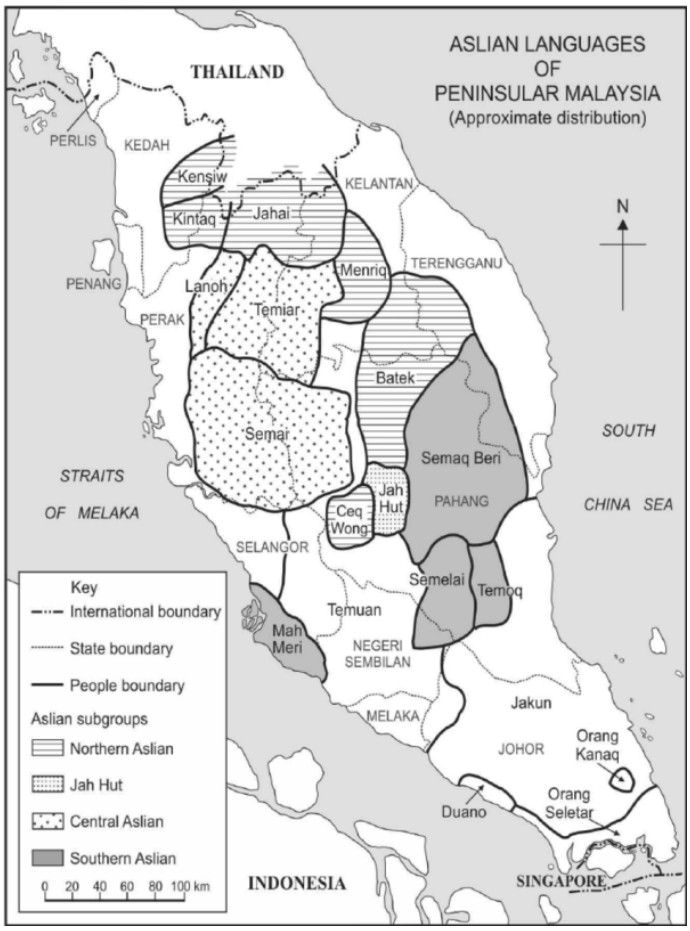

Figure 1: The distribution of Aslian languages in the Malay Peninsula (Benjamin, 2012, p. 144)

The remarkably elaborate smell vocabulary of some Aslian languages has been noted by some scholars (Majid & Kruspe, 2018), not least supporters of the universalist view. As mentioned in Section 1, many universalists have considered the chemical sense modality olfaction to be a less relevant perception modality for humans, one that is considered difficult to encode linguistically. Majid & Kruspe (2018) found a higher naming agreement of odor in the language of the hunter-gatherer Semaq Beri than Semelai, suggesting that the subsistence mode might have some impact on odor naming and recognition, as might the cultural environment. For instance, the Semaq Beri, but not the Semelai, believe that each person carries a personal odor, which prohibits siblings to sit too close to each other (this is considered incest) (Majid & Kruspe, 2018). In the same paper, the authors hypothesize that the "visual gloominess [of the primary rainforest] downgrades vision, making olfaction more salient" in these speech communities (ibid., p. 411). Olfaction might even play a crucial role for survival: objects that smell *plʔɛŋ* in Jahai may attract tigers (Majid & Burenhult, 2014), which explains the necessity

of a smell vocabulary. Other proposed possible factors for the importance of olfaction are ecology and genes (cf. Majid, 2020).

While the Aslian languages, Jahai in particular, might have received much attention concerning olfaction, less work, has been published investigating the linguistic categorization of other perceptual modalities, either individually or relative to olfaction. As shown by San Roque et al. (2015), the Central Aslian language Semai displayed a larger proportion of smell verbs in relation to other perception verbs, than all of the other 12 languages studied, but, despite the relative high frequency of smell verbs, vision verbs still dominated the hierarchy. The relative frequency of the perception verbs in other Aslian languages is still unresearched.

This paper studies the four Aslian languages Jahai, Ceq Wong, Semaq Beri and Semelai, whose genealogical background and subsistence mode is noted in Table 3 (Burenhult, personal communication, Sep. 10, 2020; Burenhult 2020, p. 167), as well as an approximate number of speakers. All four languages lack writing systems (Benjamin, 1985).

Table 3: Genealogy and culture of four Aslian languages, and number of speakers

	Subbranch of the Aslian languages	Number of speakers	Sociocultural setting
Jahai	Northern Aslian	1800	Hunter-gatherers
Ceq Wong	Northern Aslian	less than 200	Mixed economy (swiddeners)
Semaq Beri	Southern Aslian	2300	Hunter-gatherers
Semelai	Southern Aslian	4000	Swiddeners, collectors-traders

2.4 Structural characteristics of the Aslian languages

The present study concerns both lexical and structural contexts of vision verbs, and therefore a brief overview of the relevant structural characteristics of the four Aslian languages, with which this study is concerned, is provided below.

2.4.1 Northern Aslian: Jahai and Ceq Wong

The constituent order of the Northern Aslian languages is rather flexible. However, the subject of the clause tends to be clause-initial in Jahai, and can take the semantic roles of AGENT, EXPERIENCER, INSTRUMENT, FORCE, PATIENT and THEME. The direct object, on the other hand, can express either a PATIENT, THEME, PERCEPT or BENEFICIARY (Burenhult, 2005, p. 172, 197).

In both Jahai and Ceq Wong, the verb agrees with the agentive subject of the clause, but not with the object. In Ceq Wong, this is done by adding a pre-verbal pronoun cross-referencing the agent. The object can be marked with a locative marker *ka* in Jahai, with the locative marker *ka?* in Ceq Wong. In both languages, this suggests less affectedness of the object (Kruspe, Burenhult & Wnuk, 2015). Perceptual verbs are transitive, but the direct object can be omitted, making the verb "overtly intransitive" in Jahai (Burenhult, 2005, p. 210).

2.4.2 Southern Aslian: Semaq Beri and Semelai

In Semaq Beri, the syntactic subject is not bound by semantic roles, and is cross-referenced on the verb. The possible thematic roles of the direct object in Semaq Beri include PERCEPT, THEME, BENEFICIARY and PATIENT (Kruspe, 2015, p. 203). Perception verbs in Semelai are by default transitive (Kruspe, 2004, p. 107). Although intransitive subjects can also take the thematic role of an EXPERIENCER, perception verbs generally do not belong to this subclass of verbs. In contrast to the other Aslian languages, Semelai displays certain ergative-like features, namely a morphological distinction between agents of transitive verbs and subjects of an intransitive clause (Kruspe, 2004, p. 107).

3 The present study

As no previous research on the role and realisation of vision in languages of the Aslian speech communities has been conducted, this study aims to provide an initial characterization of vision and an overview of how the visual domain is structured in four Aslian languages spoken in such speech communities (Jahai, Ceq Wong, Semaq Beri and Semelai). This is done through comparisons of lexical, semantic and morphosyntactic contexts, frequency, and pragmatic uses of basic vision verbs. Cross-linguistic differences and similarities in categorization of perception, more specifically vision, in relation to the other senses, can contribute to the understanding of the interaction between language, thought and culture.

3.1 Research questions

To find cross-linguistic patterns and differences concerning the structure of the visual domain in the four Aslian languages, the possible contexts in which vision verbs occur will be identified, summarized and discussed, by first posing the following research questions concerning the frequency of vision verbs relative to other perception verbs, as well as lexical contexts, semantic scope, metaphors and pragmatic functions of the vision verbs. The results

of each language will be discussed and compared. Making cross-linguistic comparisons, in order to find the key similarities and differences, is important to fully outline the domain of vision in each of the four languages (Grondelaers, Geeraerts & Speelman, 2007, p. 150).

1. *How frequent are basic vision verbs in the Aslian languages Jahai, Ceq Wong, Semaq Beri and Semelai, compared to other basic perception verbs?*

The frequency of perception verbs is thought to reflect the cultural prominence of the senses and it can therefore begin to reveal the linguistic and possibly cultural hierarchy of the perceptual modalities (see San Roque et al., 2015).

2. *In what contexts do the vision verbs of each language occur?*
    a. *In what morphosyntactic contexts do the vision verbs of each language occur?*
    b. *Which types of entities are perceived in perception descriptions involving vision verbs?*
    c. *In what pragmatic contexts do the vision verbs of each language occur?*
    d. *Do basic vision verbs display patterns of polysemy and, if so, what are the properties of such patterns?*
    e. *Do the four languages display metaphorical mappings involving vision verbs?*

Differences between various types of vision verbs can be highlighted by investigating the morphosyntactic contexts in which the vision verbs occur, taking into account morphological marking of the object, negation, as well as possible verbal inflections (RQ 2a). Further, examination of possible targets of visual perception expressed through vision verbs yields some insight into the scope and semantic extensions of basic vision verbs (RQ 2b-e).

4 Materials and method

The following section aims to provide a brief description of the material used in this study, the method, some delimitations of the study, and lastly, how the material was analyzed.

4.1 Material

This study investigates vision verbs in a corpus of natural language use. Previously, cognitive linguistics has mainly focused on introspection, but the preference of methods of the

discipline has taken an "empirical turn" which provides cognitive linguistics with empirical methodologies (cf. Grondelaers, Geeraerts & Speelman, 2007; Fischer, 2010, p. 43). Comprising data from more than one language is necessary in order to study the structure of certain domains, as summarized by Grondelaers, Geeraerts & Speelman (2007, p. 150):

> "[…] such a variational perspective [between cultures and social groups] cannot, by definition, be realized individually. If we assume that language is not genetically so constrained as to be uniform all over the globe, and that linguistic communities are not homogeneous (two assumptions that would seem to be congenial to the non-objectivist stance of Cognitive Linguistics), then a broader empirical basis than one's own language use is necessary to study the variation."

4.1.1 Selection of material

The material used in this study was gathered from an archive of transcriptions of spoken data in Jahai, Semelai, Semaq Beri and Ceq Wong, collected by Burenhult and Kruspe (for a full overview, see *Appendix I*). The material is accessible in the archive RWAAI (Repository and Workspace for Austroasiatic Intangible Heritage), hosted at the Lund University Humanities Lab.

The study examines corpora of narratives from the four languages, comprising approximately 110 minutes of comparable material from each language (see Table 4). A specialized corpus provides a "closer link between the corpus and the contexts in which the texts in the corpus were produced" (Koester, 2010, p. 67). Johansson (2020) suggests that for a general corpus to be representative of an entire language, the size should be about 10 hours (or comprise approx. 100 000 words) and therefore this corpus cannot claim to be representative of the four languages. It is, however, deemed sufficiently rich for an introductory study of this kind.

Table 4: Content of the multilingual corpus

Language	**Number of files**	**Duration**	**Date of recording**
Jahai	10	01:50:59	2002, 2005-2007, 2012
Ceq Wong	8	01:53:10	2002-2003

Semelai	11	01:56:58	1990-1991, 2016-2017
Semaq Beri	2	01:52:44	2008

The genre *narratives* includes a variety of subcategories: myths, route descriptions from memory, autobiographical recollections of events, stories from travelling and landscape descriptions. Previous studies have tackled the issue of frequency of perception verbs with a starting point in either written data, questionnaires or conversations (San Roque et al., 2015). In the present study, the genre *narratives* was chosen due to the lack of comparable conversational data from all four languages. Admittedly, this poses certain challenges when comparing the results to, for instance, the ones by San Roque et al. (2015), but ensuring comparability between the four Aslian languages was regarded as more important, as this was a major aim of the study.

Most of the material is transcribed, glossed (according to Leipzig Glossing rules), and translated to either English or Malay by the data collectors. The data also includes linked video and audio files.

4.1.2 Delimitation and coding of basic verbs

The verbs were chosen based on Viberg's perception verb paradigm (see Table 1 on p. 10), Only the experiencer-based verbs were included (namely activity and experience verbs), excluding the source-based copulative verbs, as these two categories of verbs differ in their argument structure, more specifically the semantic roles of the subject and the object. Experiencer-based verbs take the perceived object as a syntactic object, in contrast to source-based verbs, where the perceived object is the syntactic subject of the clause.

The experiencer-based category is divided into two subcategories: activity- and experience-verbs. The difference between activity and experience verbs concerns the volition and control of the perceptual act (van Putten, 2020; Viberg, 1983). Activity-verbs additionally take an ACTOR as a subject, while the thematic role of the subject of experience verbs tends to be an EXPERIENCER (Jackendoff, 2007).

The study was limited to the basic perception vocabulary, since basic-level lexical items have been shown to be more stable, less complex and, most importantly, occur more frequently (Witkowski & Brown, 1983). The relevant verbs were provided by Kruspe and Burenhult (personal communication, Sep. 24, 2020). In accordance with Viberg (1983) and San Roque et al. (2015), a distinction between activity- and experienced perception is made when necessary.

The morphologically complex forms (added in parentheses) are also searched for. The verbs are noted in Table 5.

Table 5: Relevant perception verbs

	Jahai		**Ceq Wong**		**Semaq Beri**		**Semelai**	
	Activity	Experience	Activity	Experience	Activity	Experience	Activity	Experience
SIGHT	ʔɛl		daŋ	yow	nɔ̃t	(da)ʔye	jŋɔʔ (jʔŋɔʔ)	ʔye (yʔye, trye, ʔyeʔiʔ)
HEARING	kjeŋ		hmɑ̃ŋ	kəjəŋ (kəŋjəŋ)	biŋliŋ	(da)ʔyəŋ	trsɒʔ (trʔsɒʔ)	ʔyəŋ (yŋyəŋ, tryəŋ)
TOUCH	ptpət, pitɨl, grsɨc	-	təpəʔ	-	-	hamɑ̃ʔ	-	ɲam
TASTE	kmyĩm	hɔ̃t (?)	no data		sɔʔ		rasaʔ	
SMELL	ʔɔ̃ɲ		ʔɔ̃ɲ	?	ʔũɲ	sem	jhɔn	

Semelai and Semaq Beri conflate several sensory modalities into one experience-based lexical item, so called *multisense* verbs, which were classified as such in the data. As one of the research questions concerns the relative frequency of vision verbs relative to other perceptual modalities, verbs denoting the other four senses, such as audition, olfaction, gustation and feeling were also searched for.

The scope of this study could not possibly include the rich complexity of the perception lexicon, extending much further than what is shown in Table 5 above, especially within the domain of visual perception. The Aslian languages, with which this study is concerned, all have very elaborate and semantically fine-grained lexica, especially within the domain of perception (Kruspe, Burenhult & Wnuk, 2015, p. 466; Kruspe, 2015, p. 513). In addition to the basic verb for VISION, there are numerous verbs which encode direction of the action of seeing and proximity of the object seen in separate monolexemic forms (Kruspe, personal communication, Sep. 24, 2020). Jahai, for instance, utilizes eight different specialized verbs for visual perception depending on the direction of the perception (looking up, down, sideways

etc.). These lexemes will neither be searched for, nor included in the frequency analysis, as they are not part of the basic perception lexicon. However, they are of undeniable interest in future studies concerning the conceptualisation of VISION in the Aslian languages.

Parts of the transcriptions, which are included in the corpus, have annotations of word classes. This is especially relevant for studying the Semelai data, as the verb for tasting (*rasaʔ*) can be used both as a verb and a noun. Therefore, all occurrences of *rasaʔ* as a noun can be automatically excluded.

4.2 Method and data analysis

Through methodological triangulation, different contexts of vision verbs will be investigated from several perspectives to help characterize the domain of vision in the Aslian language environment. In order to find each occurrence of the verbs and its respective context, the words of interest (noted in Table 5 above) were searched for using the "search for in multiple files" function in ELAN 5.9 (ELAN 2020), and then the number of occurrences was counted for each verb and each language. The multisense verbs in Semelai and Semaq Beri were assigned their own category of *multisense*, see Table 5 on p. 19.

4.2.1 Context analysis

The annotation in which each vision verb occurred, was then extracted, with translation and glossing if available. If the verb denoted physical perception of an entity (such as *seeing a snake*) or abstraction (for example, *seeing that time has passed*), the category of the target of perception was noted. These categories (*human, animal, concrete object, abstract, event, place* and *general visual ability*) were partly based on San Roque et al. (2015), and partly on the data itself. As opposed to actual concrete things or animals, the category *event* refers to situations, as in "Pete sees the people setting up a trap". The category *place* includes examples such as "Look *over there*".

The relatively small sample size allows for studying larger parts of the source files to find the target of the vision verb, in case of the local context of the sentence being insufficient to determine the target. Potential semantic extensions were determined based on the glosses and free translations by the data collectors, and were assigned to one of the semantic domains listed below. In a cross-linguistic study, these were shown to often be associated with the domain of vision (San Roque, Kendrick, Norcliffe & Majid, 2018).

COGNITION
ATTENTION

SOCIALIZING
LOCATING
TRYING
CO-IDENTIFICATION

If the meaning of the vision verb was clearly outside of the visual domain, although with a related sense, this was regarded as polysemy.

4.2.2 Cross-linguistic comparisons

The comparisons between the four languages were analyzed through descriptive statistics of the frequency of all perception verbs, to visualise "the general shape […] of the data" (Levon, 2018, p. 141). Both the number of verbs, as well as relative percentage of each sense modality were calculated.

The vision verbs were then compared in terms of possible stimuli, polysemous structures, metaphoricity, and pragmatic uses. The different uses and senses of the vision verbs were structured in a table, with positive coding if the language data set displayed the sense in question. The results were visualized through a semantic map with language-specific isolectic sets, showing the linguistic similarities and differences. The goal of a semantic map is to map a potentially "universal network of semantic extensions" (François, 2008, p. 163; Koptjevskaja-Tamm, Rakhilina & Vanhove, 2015). Evidently, truly universal patterns of colexification and semantic extensions are few, but the isolectic sets, which maps each language position in the map, can reveal statistical tendencies within the set of languages.

5 Results

This section outlines the frequency and contexts of the vision verbs in four languages, and aims to answer the research questions found in Section 3.1.

5.1 Frequency of basic perception verbs

In the data from all four languages, basic vision verbs occur more frequently than the other perception verbs together, see Table 6. In regard to frequency, vision verbs are followed by hearing verbs in all four languages. The Semaq Beri data set contains the least vision verbs (*N*=34), which is approx. four times less than the number of vision verbs found in the Ceq Wong data (*N*=130).

Table 6: Frequency of basic perception verbs

	Sight	Hearing	Touch	Taste	Smell
Jahai	67	7	0	0	0
Ceq Wong	130	23	1	0	11
Semaq Beri	34	9	0		4
Semelai	71	39	11		

The relative frequency was the highest for vision verbs in the data from all four languages, followed by hearing-verbs, as is shown in Figure 2. (For the absolute frequency of basic perception verbs, the reader is referred to Table 6 above.) Smell verbs in the Semaq Beri and Ceq Wong data make up approx. 10% of all perception verbs, as does the experience-based multisense verb in Semelai. The verb which denotes touching is only found in the Ceq Wong data (*N*=1).

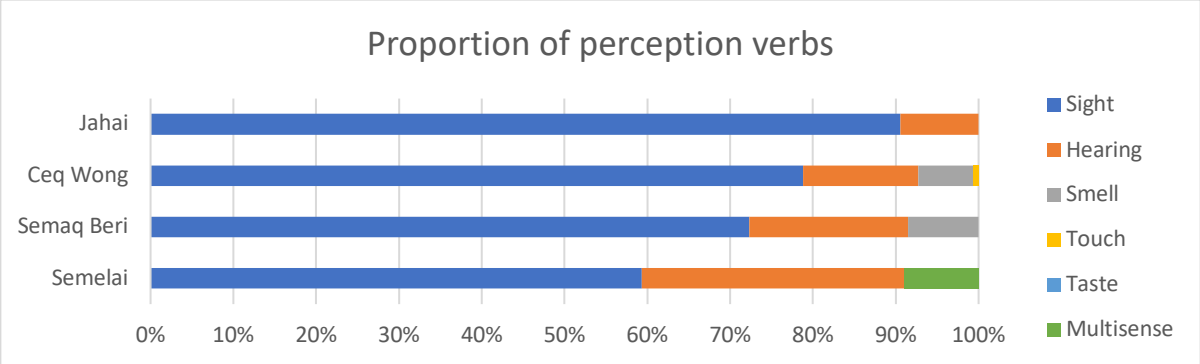

Figure 2: Proportion of perception verbs

5.2 Frequency of activity verbs and experience verbs

The difference between the number of activity and experience-based vision verbs is the greatest in the Ceq Wong data set, namely 92 more activity verbs than experience verbs, see Table 7. The difference is considerably smaller for the vision verbs found in the Semaq Beri and Semelai data sets. Jahai does not make a lexical distinction between activity and experience vision verbs.

Table 7: Frequency of activity and experience verbs

Jahai	Ceq Wong		Semaq Beri		Semelai	
	Activity	Experience	Experience	Experience	Activity	Experience
ʔɛl	daŋ	yow	nɔ̃t	(da)ʔye	jŋɔʔ	ʔye
67	111	19	21	13	30	41

Activity verbs occurred more frequently than experience verbs in both the Ceq Wong and Semaq Beri data set, albeit to varying degrees. Approx. 85% of the vision verbs in the Ceq Wong data set were activity verbs, while the same type of verbs only comprised approx. 62% of the vision verbs occurrences in Semaq Beri, see Figure 3. The Semelai data was the only one in which experience verbs occurred more frequently than activity verbs (58%).

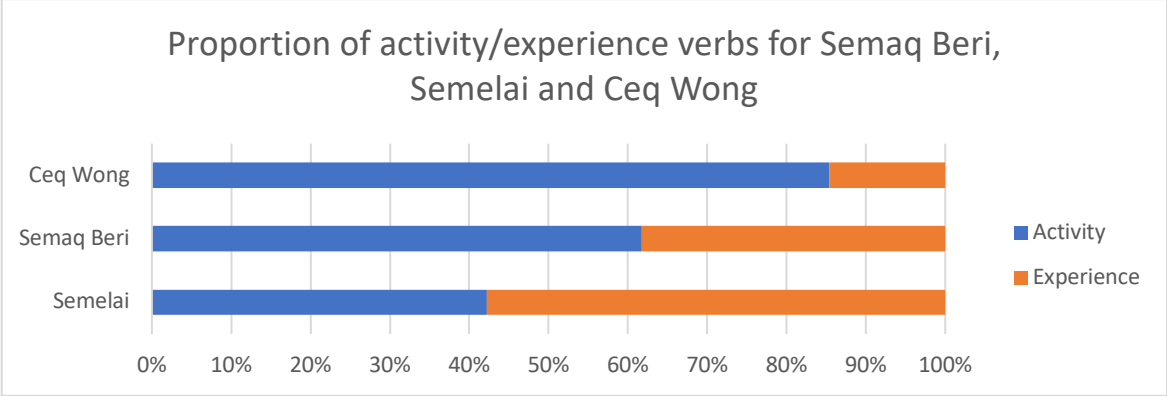

Figure 3: Proportion of activity and experience verbs

5.3 Morphosyntax

In order to outline the characteristics of basic vision verbs in the four Aslian languages, not only lexical, but also structural contexts are taken into consideration. Therefore, a brief overview of the syntactic structures in which the vision verbs occur is given in the section below. Note that the absence of certain structures in the overview below does not necessarily mean that the structure does not exist in the language, but rather that it is unaccounted for in the data.

5.3.1 Jahai

The basic vision verb *ʔɛl* in Jahai occurs mostly in transitive clauses. The object of the transitive clause is often marked with the prepositional proclitic *ka*, realised as *k-,* through which the location of the NP is expressed (Burenhult, 2005, p. 126), see example 1. Oblique

arguments in transitive vision clauses tend to be prepositional phrases headed by the morpheme *ba* (example 2), indicating the goal of concrete or abstract motion (Burenhult, 2005, p. 127). Followed by the adverb *sʔoʔ*, it receives the reading 'to have a look', or lit. 'to look a little', as in example 3.

(1) ca=ʔɛl k=pay
HORT=look LOC=2SG.DIS
'Look at you.' (jhi:10[2])

(2) ʔoʔ ʔɛl ba-pɛ̃w tɔm
3SG look.at GOAL=other stream
'it's looking at another stream' (jhi:3)

(3) k=tə̃h, ya=ʔɛl sʔoʔ
LOC=DEM IRR=look a.little
'here, let me have a look' (jhi:3)

5.3.2 Ceq Wong

The object of the activity-expressing vision verb *daŋ* in Ceq Wong is often encoded in a prepositional phrase. The preposition is however not required, as is shown in the two examples 4-5 below. The locative preposition *kaʔ* is not restricted to places but can also be used to refer to visual perception of people. The verb *daŋ* does not require an overt object, see example 6 and 7.

(4) daŋ kaʔ hɛʔ, hɛʔ jamũʔ.
look LOC 1PLIN 1PLIN entertain.guest
'look at us, like we entertain guests.' (cwq:4)

(5) daŋ bayeʔ
look Baik.River
'We looked at Baik River.' (cwq:1)

(6) ʔu=cɨp, ʔu=daŋ.
3SG=go 3SG=look.at
'He went and he looked.' (cwq:7)

(7) lah mɛ̃ʔ ʔu=daŋ nɑ̃ʔ.
EMPH want 3SG=look umm
'She wanted to look, umm.' (cwq:3)

[2] The source of each example is marked with the corresponding ID-number found in *Appendix II*.

The word yow, which refers to a visual experience, as opposed to an activity, is often nominalized by means of the morpheme nə, see examples 8-9 below.

(8) lər nə=yow talon.
then NMZ=see snake
'Then we saw the snake.' (cwq:1)

(9) həʔ nə=yow də=yɑʔ.
NEG.exist NMZ=see FOC=grandmother
'The grandmother didn't see.' (cwq:5)

Like *daŋ*, the core argument of *yow* can be marked with the locative preposition *kaʔ,* however it does so much less frequently than *daŋ*.

(10) yow wel kaʔ hyãʔ daŋãw,
see too LOC house delapidated.house
'He saw a delapidated house...' (cwq:2)

5.3.3 Semaq Beri

Neither activity, nor experience-based vision clauses encode the object of the verb with a preposition in the Semaq Beri data.

(11) kɛ nɔ̃t balɑːʔ sipot
3SG look.at be.many snails
'He looked at the many snails.' (szc:2)

(12) ʔarɛh daʔye heʔ daʔye ʔɔmbak lawot
only.then see 2SG.M see wave sea

hanɛ̃h hn kɛ
FUT.PROX QUOT 3SG
'"Only then will you see, see the ocean waves later" he said.' (szc:2)

Both forms of the experience-based vision verb *daʔye* and *ʔye* often occur in negated clauses, preceded by the NEG-marker *beh*. In the contexts below the verb often denotes general visual ability.

(13) ʔah təʔ, ladaʔ, beh kɛ=ʔye lah
EXCL that chili NEG 3SG=see EMP
'Ah, because of the chili, he couldn't see.' (szc:1)

(14) kaloʔ mɔ̃k bŋãh təʔ ʔasiŋ hɛ daʔye
if like day that other 1incl see
'If it is like daytime, it's different, we can see.' (szc:1)

In combination with the negation *beh,* the Semaq Beri vision verb *ʔye,* can mean ‘to be blind’. The literal translation of example 15 is ‘his eyes did not see’.

(15) beh kɛ=ʔye mɔ̃t kɛ . . .
NEG 3sg=see eye 3sg
‘He couldn't see.’ (szc:1)

5.3.4 Semelai

The ergative-like marking found on the agent in transitive clauses is what characterizes Semelai and distinguishes it from the other three Aslian languages, see examples 16-18. The objects of the transitive vision verbs (*jŋɔʔ* and *ʔye*) are generally not preceded by a preposition.

(16) ki=jŋɔʔ ʔatɛ brbɒy
3SGA=to.look dirt dug.up?
‘He looked at the dug-up earth.’ (sza:3)

(17) ʔyot tet dɔl, ki=jŋɔʔ,
return TO house 3SGA=to.look
‘Returning home, he looked.’ (sza:6)

(18) ʔoooh ji=ʔye grcɛ̃ŋ yɛ
EXCL 2A=see a.little.hair.standing.up.straight 1SG
"Oooh can you see my hairs standing on end?” (sza:10)

5.4 The target of physical perception

As mentioned in the introduction to Section 5.3, both lexical and structural contexts are important in outlining the notion of vision in these languages. In its core sense, perception verbs denote physical perception of an entity or object, henceforth referred to as *the target* or *the object of perception*.

Table 8 illustrates the different types of targets of visual perceptions present in the different data sets indicated with a plus sign. The lack of a plus sign does not mean that it is ungrammatical or semantically incongruous to use the verbs in these contexts; it merely marks that it is absent in the data. *Appendix II* presents some examples which illustrate the type of stimulus and context. In all four language data sets, examples of perceiving of humans, events and concrete objects are found (areas marked in green in Table 8).

Table 8: Target of visual perception

		Jahai	Ceq Wong		Semelai		Semaq Beri	
			Activity	Experience	Activity	Experience	Activity	Experience
	Target of perception	ʔɛl	daŋ	yow	jŋɔʔ	ʔye	nɔ̃t	(da)ʔye
Animate	Human	+	+	+	+	+	+	+
	Animal		+	+	+	+	+	
Non-animate	Place	+			+		+	
	Event	+	+	+	+	+	+	+
	Concrete object	+	+	+	+	+	+	+
	Abstract		+					
	General visual ability							+

The Jahai verb *ʔɛl* is used to denote vision of three different types of perceived objects in the data, namely *humans, concrete objects* and *places.* Unlike Jahai, Ceq Wong distinguishes between vision based on activity (*daŋ*) and experience (*yow*), but both verbs are used to express visual perception of e.g. humans, animals, and concrete objects. The verb *daŋ* is in the data used for abstract stimuli, as well as events and situations, as is shown in example 19.

(19) daŋ kɑʔ nəŋ, ʔu=wek kaʔ hyãʔ
look.at PERF be.long.time 3SG=return LOC house
'Seeing it had been a long time, he went home…' (cwq:7)

Similar to Ceq Wong, Semelai makes use of two different vision verbs, depending on whether the perception is an activity or an experience. Both these words (*jŋɔʔ* and *ʔye*) occur in contexts of looking at humans, situations or events, and concrete things. In the data, perception of abstract objects, as well as animals, is only expressed using *ʔye*.

Lastly, the Semaq Beri activity verb *nɔ̃t* is used to denote visual perception of both inanimate and animate targets, while the experience vision verb *(da)ʔye* occurs in contexts of perception of humans, concrete things and situations. Additionally, it can also express general visual ability.

5.5 Polysemous structures and semantic extensions

No clear occurrences of polysemy can be found, with the exception of two possibly metaphorical examples, which are first discussed in Section 5.7, and further in Section 6.3.

However, there are cases of wider semantic range than the core vision meaning. For instance, in the data from Jahai (see example 20 below), basic vision verbs are also sometimes used to denote visual scanning in order to find something, namely the category of LOCATING. As mentioned in Section 4.2.1 (see also Table 9 below), this is a domain that often is associated with SEEING. It is unclear whether or not this is a case of semantic extension from a core vision meaning, but since the lexica of both languages include other lexemes for searching, the examples might just be a case of semantic generality or vagueness.

(20) yɛh ʔɛl ba=gin bɛr yɛʔ
1PL look GOAL=2/3P younger.sibling 1SG
'we looked for my younger brothers' (jhi:1)

Table 9: Semantic extensions and pragmatic functions of vision verbs in the Northern Aslian data

	Jahai	Ceq Wong	
		Activity	Experience
Semantic extensions	*ʔɛl*	*daŋ*	*yow*
LOCATING	+		
Pragmatic function			
ATTENTION	+	+	

5.6 Pragmatics

In both the Jahai and Ceq Wong data, the vision verbs are used to seek the listener's attention, with the aim to draw it to either spatially and temporally proximal (example 21) or distant (example 24) events. No similar examples of pragmatic uses are found in the Southern Aslian data sets.

Jahai imperative clauses are often expressed by adding the hortative (advisory) prefix *ha, ca* or *ka* to the verb (example 21-22). In constructions like these, the verb is often followed by the emphasis marker *lɛh*, a loanword from the Malay *lah*. Ceq Wong displays similar patterns,

drawing attention to an observable example, not necessarily in the immediate context of the speaker (example 23-24).

(21) ka=ʔɛl, yɛʔ bay, ja=yɛʔ k...
HORT=look 1SG dig then=1SG
'look, I dig, then I...' (jhi:8)

(22) ca=ʔɛl ba=ʔaniʔ
HORT=look GOAL=there
'look that way' (jhi:8)

(23) daŋ dɑʔ jin!
look DEM 2SG
'Look here you!' (cwq:3)

(24) daŋ nidih hntɨŋ yəʔ hɔŋ
look nowadays be.afraid too wind
'Look now, now I am still afraid of the wind' (cwq:8)

5.7 Metaphors

There are no clearly identifiable instances of metaphorical readings of vision verbs in the data from any of the languages, despite what previous cross-linguistic research on other languages around the world has shown. Ambiguous examples, such as the one in example 25, are discussed in Section 6.3 of this paper.

(25) daŋ kɑʔ nəŋ, ʔu=wek kaʔ hyãʔ
look PERF be.long.time 3SG=return LOC house
'Seeing it had been a long time, he went home…' (cwq:7)

5.8 Semantic map of basic vision verbs

As a visualization of the results presented in Section 5.4-5.7, Figure 4 shows a network of possible targets of visual perception for the four Aslian languages, as well as the domains associated with vision through an extended semantic scope from the core sense of the vision verbs and its pragmatic uses. The semantic map of basic vision verbs in the four languages studied is based on the contexts found in the corpora (François, 2008, p. 175).

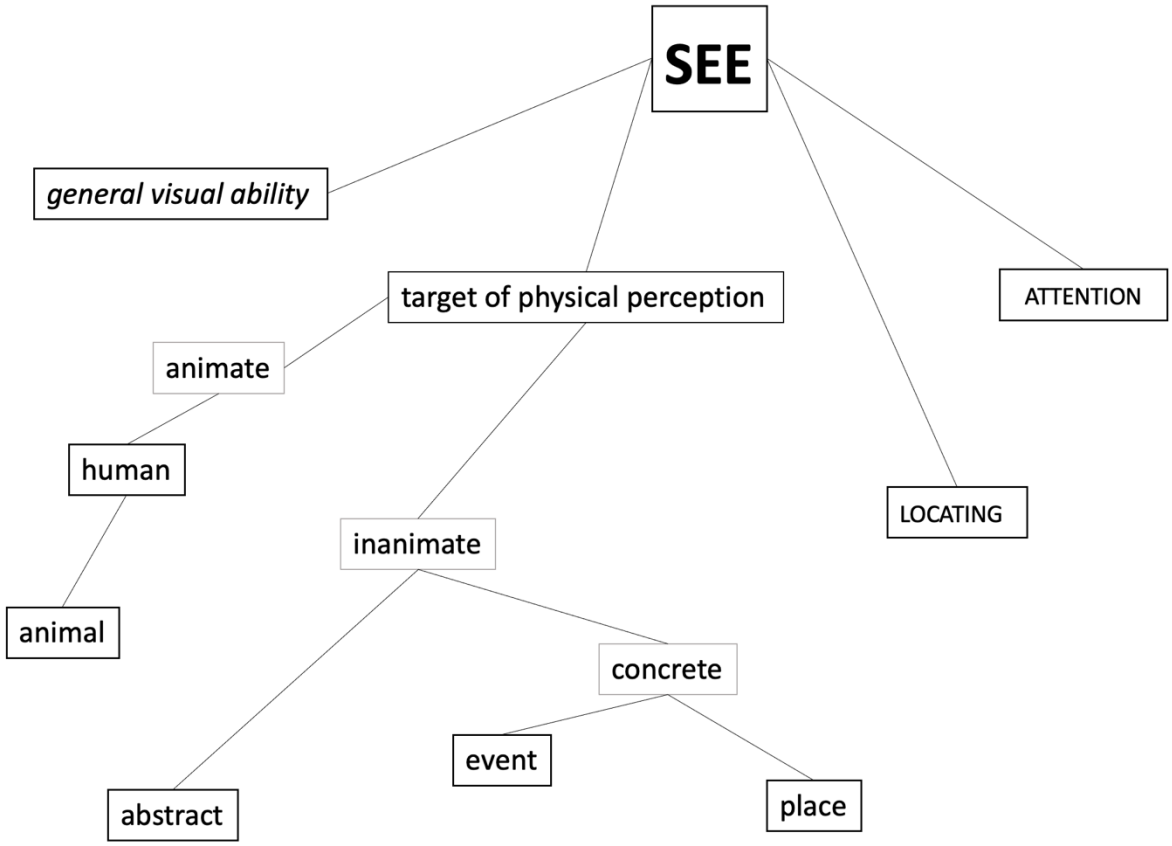

Figure 4: Semantic map of the basic vision verbs

6 Discussion

6.1 Patterns of Aslian vision verbs

6.1.1 Vision and beyond

In line with the results of Viberg (1983) and San Roque et al. (2015), a majority of the perception verbs present in the data from all four Aslian languages were vision verbs, consistently followed by audition verbs, see Figure 2-3 on pp. 22-23. Verbs denoting taste and touch are practically absent from the data, except for one occurrence of the Ceq Wong touch-verb *təpəʔ*. In San Roque et al.'s cross-linguistic study on the frequency of perception verbs (2015), the data set of 13 different languages included the Central Aslian language Semai. In the conversational corpus used in that study, the verb for smelling was more frequent than the hearing verb. Comparing these results to the ones of the present study, the absence of smell verbs in the Jahai and Semelai data sets is somewhat surprising.

Interestingly, basic SMELL verbs are only found in the Semaq Beri and Ceq Wong data, although results from previous research would suggest that speakers of Semelai and Jahai also

refer to this sense modality, as it is of great importance in many of these societies (cf. San Roque et al., 2015; Majid & Kruspe, 2018). The Semelai, however, "have a taboo on using odor terms in the forest" (Majid & Kruspe, 2018, p. 412), and therefore the location where the narratives were recorded could have affected the results.

The size of the corpora is modest, which could account for the absence of smell words. However, the article by San Roque et al. (2015) used corpora about half the size of the ones used in the present study, and still, the number of smell verbs in the Semai data was higher than for any of the other languages in their study.

The main difference between the study conducted by San Roque et al. and the present study is the genre of the corpus. The former used conversational data, including two 10 minute-conversations during food preparation and eating (ibid., p. 29), while the corpora used in this study include myths, and other monologues from memory, see Section 4.1.1. It seems reasonable to assume that the word used to denote smelling would occur in situations like these to a higher extent than in myths or landscape descriptions, which are found in the corpus of the present study. Although cultural prominence is thought to be reflected in frequency of lexical items, the genre of the corpus can have an enormous impact on the frequency of perception verbs (cf. Caballero & Paradis, 2015), and therefore the lack of smell words might be traced back to the type of corpus used in the study.

Another possible explanation is that the importance of olfaction instead is manifested through high relative lexical frequency of other smell-related words, rather than the basic verbs meaning 'to smell'. As briefly mentioned in Section 4.1.2, monolexemic forms in the Aslian languages tend to encode specific information, which in the perceptual domain includes for instance direction of gaze. Wnuk (2016, p. 238) notes that the most elaborated verbal networks are often related to culturally prominent situations and indigenous specialties in Maniq, another Aslian language. This would mean that a domain of particular relevance in indigenous rituals and beliefs, but also to some extent necessary for survival, namely the domain of olfaction, contains more verbs of higher specificity, from which speakers can choose.

One of the more influential papers on olfaction in Jahai-speaking hunter-gatherer communities is Majid & Burenhult (2014). The authors list some of the smell-verbs of Jahai (for instance *cŋəs*: 'to smell edible'). All of these fit into the Viberg paradigm column of source-based verbs, namely that the subject of the verb is the source of the smell. Since the present study only concerns the experiencer-based verbs (both activity and experience-denoting), it is possible that more smell verbs can be found when also searching for source-based verbs. Future research may shed light on this issue.

6.1.2 Vision: the dominating sense

The results of this study provide support for the hypothesis of universal vision dominance. In all four languages, independently of the genealogical subbranch of the Aslian language family, or subsistence mode, vision is the dominating sense modality in regard to its relative frequency. Based on statistical cross-linguistic tendencies, the fact that vision tops the lexical hierarchy of the senses in the data would also entail that it is more susceptible to semantic extensions, pragmatic functions and metaphoricity. This can be partly argued for two of the languages, namely the two Northern Aslian languages Jahai and Ceq Wong. *ʔɛl* is used in the context of *searching by looking,* namely LOCATING. Furthermore, both *ʔɛl* and *daŋ* can be used to ask for the listener's attention: in Jahai sometimes made clear by adding a hortative prefix. In contrast, the Southern Aslian data set does not display any such extended uses involving basic vision verbs.

6.1.3 Genealogical differences

Figure 5 illustrates in what way the basic vision verbs are used in each of the languages, based on the data. Each colored line represents one language. The grey area in Figure 6 illustrates the presence of the object of perception in the data of all four languages, while the green area reflects the semantic extensions found only in the Northern Aslian data.

In the Southern Aslian data set (blue areas), the vision verbs are only used with overt objects of perception, including both animate and inanimate objects. Unlike the data from Semelai, the verb for the experience-based vision in the Semaq Beri data ((*da*)*ʔye*) also denotes general visual ability. Each colored line in Figure 6 represents the present contexts of the occurrences of vision verbs in the data sets.

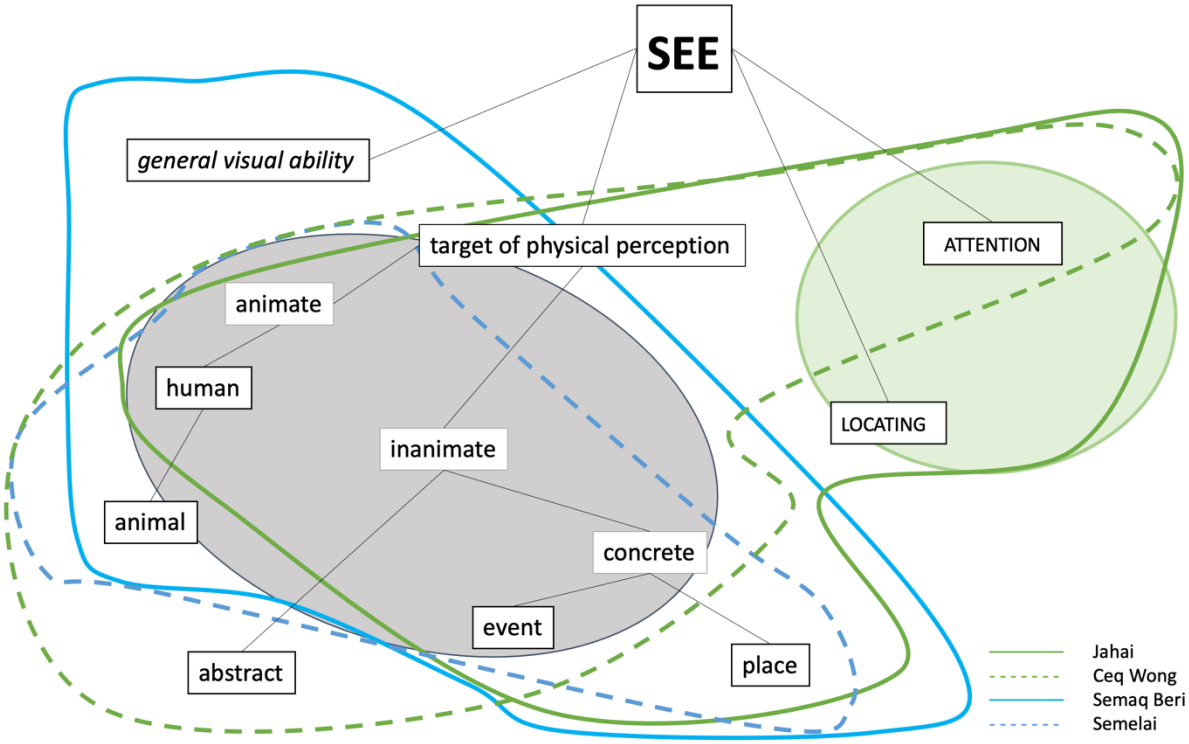

Figure 5: A semantic map of vision, and the isolectic sets of each language

In contrast to the Southern Aslian data, the use of vision verbs in Jahai and Ceq Wong extends beyond usage with overt objects of perception, albeit with further internal differences, such as disputable examples of metaphorical use (see examples 34-35 on pp. 36-37) and a wider semantic scope in the Ceq Wong data, as well as the objects of visual perception, expressed with the relevant vision verbs. In the Ceq Wong data, SEE is used to denote perception of animals, a context which the Jahai data lacks. In the Jahai data, on the other hand, the speakers often make use of SEE when referring to vision of places, in contrast to Ceq Wong. The Jahai corpus consists of many landscape descriptions, in contrast to the Ceq Wong data. Therefore, denoting perception of places is more likely in the Jahai data than in the Ceq Wong.

Although this observed difference between the two Northern Aslian languages may well be an artefact of the different natures of the corpora, it is worth noting that any such differences between them may find support in geographical, historical, and cultural circumstances. For instance, the internal variation within the Northern Aslian data sets from Jahai and Ceq Wong can possibly be traced to the geographical distance between the languages. Since speakers of Aslian languages are prone to language contact with other foragers living in geographical proximity (Yager, 2020, pp. 29-31), lexical change may have occurred in the direct language contact between Ceq Wong and other more distantly related Aslian languages, for instance Jah-Hut, as suggested by Diffloth (1975). This is however challenged by the view that unmarked,

basic verbs generally are considered to be a very stable part of the lexicon (Witkowski & Brown, 1983). The origin of Northern Aslian is still being debated – some believe that this subbranch originated in the region where Ceq Wong is spoken today (Bulbeck, 2004), and while parts of the population spread north, some stayed. This divergence of the proto-languages is believed to have occurred approx. 1,500-2,000 years ago (Dunn et al., 2013; Bulbeck, 2004, pp. 375-376). Ceq Wong speakers are believed to have been relatively (but not completely) isolated, without much contact with the Malay-speaking majority population (Kruspe, 2009).

The differences between Jahai and Ceq Wong could ultimately also have some connection to cultural differences. Ceq Wong speakers do not belong to the Semang population, in contrast to the rest of the Northern Aslian languages (Burenhult, 2020, p. 184; Dunn, Burenhult, Kruspe, Tufvesson & Becker, 2011). The Ceq Wong still have "the mixed economy which is thought to be typical of the society in which Aslian originated (Bulbeck, 2004, cited in Burenhult, 2020). While Ceq Wong kept the mixed economy, both lexicon and the foraging style of the other Northern Aslian groups might have changed simultaneously, giving rise to subtle semantic shifts of the different senses of lexical items.

6.2 A reinterpretation on the presence of prepositions in Jahai

The distinction between activity and experience verbs of visual perception is in Jahai not made lexically: only *one* lexical item is used for both contexts. This introduces the question of if, and, if so, how, a distinction between activity and experience is made in Jahai. The following paragraphs will discuss this topic.

As is mentioned in Section 5.3.1 of this essay, the objects found in the Jahai data are marked with either LOCATION or GOAL-preposition, see example 31 (Burenhult, 2005, p. 207). Not all perceived objects are marked with a prepositional prefix though, see examples 33-34. At first glance, the difference between the phrases with and without prepositional markers might not be very salient. However, Kruspe, Burenhult and Wnuk (2015) suggest that the presence of a preposition on the PATIENT in a transitive clause can reflect "reduced affectedness of the object" (2015, p. 457). This reflection brings our attention to the distinction between activity and experience-verbs.

(31) ca=ʔɛl k=pay
HORT=look LOC=2SG.DIS
'Look at you.' (jhi:10)

(32) ʔoʔ ʔɛl ba=pɛ̃w tɔm
3SG look GOAL=other stream
'it's looking at another stream' (jhi:3)

(33) yɛʔ ʔɛl ʔap ba=sɛŋ taniʔ
1SG look tiger GOAL=there there
'I saw tigers there' (jhi:7)

(34) ʔɛl lataʔ sunaŋ
look waterfall Sunaŋ
'look at the waterfall of Sunaŋ' (jhi:2)

One aspect of the distinction between these types of verbs is expressed by Jackendoff in his book *Language, Consciousness and Culture* from 2007. He introduces a formal method to express the difference between the activity *to look at* and the experience *to see* by adding a macrorole tier (Jackendoff, 2007, pp. 204-206). Both LOOKING and SEEING express visual contact between subject and the stimulus, but the main difference between them is that LOOKING does not necessarily imply a second argument. The difference between LOOKING and SEEING lies in the macrorole tiers [X AFF] (*X acts on/affects…*) and [X EXP Y] (*X experiences Y*). SEEING receives a second argument, and the subject becomes an EXPERIENCER, which requires an overt or implied second argument, namely the PATIENT, in contrast to the activity verbs, which only require one argument (but still allowing a higher valency), namely the ACTOR.

X looks at Y.

$$\begin{bmatrix} \text{X SENSE}_{\text{visual}}\ \text{Y} \\ \text{X AFF} \end{bmatrix}$$

X sees Y.

$$\begin{bmatrix} \text{X SENSE}_{\text{visual}}\ \text{Y} \\ \text{X EXP Y} \end{bmatrix}$$

The aforementioned phenomenon of "reduced affectedness of the object" (Kruspe, Burenhult & Wnuk, 2015, p. 457) fits Jackendoff's description of activity verbs. The connection between presence of prepositions and activity verbs are also found in other language, Swedish being one of them (*se*, to see*,* vs. *titta på,* lit. 'to look at'). English activity verbs also have an added preposition, *to look* ***at*** or *to listen* ***to***.

These are merely initial speculations, and more research has to be carried out to reach any conclusions on the general distinction between activity and experience-perception verbs in Jahai. The data, however, hints that the presence of prepositions affects not only the structural context, but also the semantics of the clause to a higher extent than previously believed.

6.3 Perception metaphors

Conceptual metaphors are believed to be a fundamental aspect of our conceptualization of the world. Cognitive mappings between domains, determined through schematic similarities, allow humans to conceptualize abstractions in terms of concrete concepts grounded in bodily experience of interactions with the environment. These conceptual metaphors, which manifest themselves through both verbal and signed linguistic expressions, are said to exist in every culture and are considered a fundamental component of human thinking.

Not much research has been published on the topic of figurative language in the Aslian languages. Burenhult and Kruspe (2016) note "a general absence of figurative language and conceptual metaphor in these languages" (p. 14), and this also seems to be the case for vision verbs, despite the claim of its universality. It is interesting to note that the materials analyzed here do not contain any clear-cut examples of vision verbs used metaphorically.

Despite the absence of figurative language, some phrases containing vision verbs in Ceq Wong, shown below, could be understood as metaphorical, or at least not fully literal.

(35)	daŋ	kɑʔ	nəŋ,	ʔu=wek	kaʔ	hyãʔ
	look	PERF	be.long.time	3SG=return	LOC	house

'Seeing it had been a long time, he went home…' (cwq:7)

Speakers of Ceq Wong tell the time by looking at the sun, and therefore example 35 above refers to actual vision and recognition of the changed position of the sun. However, the object of the verb *daŋ* is *nəŋ* [be.long.time]. This abstract, clausal object could indicate non-literal use of the verb. Perhaps, the sentence actually is denoting *understanding through vision*. The speaker has deducted that a long time has passed by acknowledging the changed position of the sun, or by following its trajectory across the sky.

The same reasoning can be applied to the Jahai example below. The locative preposition *ka*, in its non-reduced form, cannot be read metaphorically (Burenhult, 2005, p. 126), indicating that the speaker intended to refer to something concrete, before interrupting herself. But one cannot exclude the possibility that the speaker aimed for a more metaphorical meaning, like the Ceq Wong example above, namely deducing or understanding through visually examining something concrete.

(36) mɔh ʔɛl ka=... yɛʔ kbet ʔə̃h, ja=braʔ
2SG look LOC=… 1SG old.woman DEM RT=NEG

ka=wɔŋ yɛʔ
LOC=child 1SG
‘you see... I'm old, I don't get children anymore’ (jhi:8)

It may not be a coincidence that examples like these only seem to occur in the Northern Aslian data. The data of these languages have repeatedly displayed greater variation and flexibility of VISION. It is, for instance, found in different pragmatic contexts, and used as an attention-seeking expression.

The Southern Aslian data suggests that the two languages Semelai and Semaq Beri are somewhat more restrictive in regard to the semantic extensions of vision verbs. Polysemous structures are not found in the data, and occurrences of linguistic expressions based on COGNITION-VISION mappings are missing, in contrast to the two examples from Jahai and Ceq Wong.

Due to the design of this study, only potential Transfield I and Intrafield-metaphors could have been identified, seeing as only the verbs denoting perception are searched for. It is unlikely, however not impossible, that the proposedly universal mapping PERCEPTION – COGNITION manifests itself through linguistic expressions, which express more concrete concepts (e.g. PERCEPTION) in terms of more abstract ones (e.g. COGNITION).

Further, the lack of figurative language in the domain of vision does not imply that the mapping UNDERSTANDING IS VISION does not apply in these languages. These are languages based on oral traditions, rather than chirographic and typographic ones, and this type of languages has been proposed make use of UNDERSTANDING IS VISION mappings to a lesser extent (Ritchie, 1991, pp. 192-193). Instead, it might be the mapping UNDERSTANDING IS PERCEPTION that is expressed in the languages (Ibarretxe-Antuñano, 2008). In order to decide this, more extensive research will have to be conducted on other perceptual modalities, in particular SMELL, as this modality has been shown to be of particular importance to some hunter-gatherers (Majid, 2020; Wnuk & Majid, 2012).

7 Conclusions and further research

This study has taken its starting point in the context of vision verbs in natural language use, discussing several aspects of such vision verbs. Verbs denoting vision occur more frequently than other perception verbs in the data from all four languages. Additionally, the object of the

visual perception is not restricted to concrete objects. Visual perception of events can also be expressed using the basic vision verbs of all four languages, and the Ceq Wong vision verb *daŋ* can denote perception of abstract objects, such as time passing. Within the framework of CMT, the perception of time passing can have some metaphorical reading, indicating that there might be examples of conceptual metaphors, despite previous claims of little figurative language in this language family, further illustrating the importance of vision. As for polysemous structures, the vision verbs of the two Northern Aslian languages occur in domains outside of vision, such as LOCATING and ATTENTION-SEEKING, which are domains that in many languages are tightly linked to the domain of vision. The basic vision verbs of Jahai and Ceq Wong are repeatedly shown to have a pragmatic function in discourse, as they are used to request the attention of the interlocutor.

It is striking that vision still plays an important role and occurs frequently in Aslian languages, which previously have been claimed to emphasise olfaction. This supports the *hypothesis of vision dominance.*

Some genealogical differences regarding how the basic vision verbs are used arise. Semantic extensions are only present in the Jahai and Ceq Wong data, the two Northern Aslian languages which also display great variability of possible contexts.

The data also suggests that Jahai, a language that does not distinguish between activity and experience-type vision verbs lexically, instead makes this distinction by adding a preposition (either LOC or GOAL-marker). Similar patterns are found in other languages, such as English and Swedish. Gisborne's book *The Event Structure of Perception Verbs* (2010) gives an introductory overview on the role of prepositions in English perception phrases, which may act as an inspiration for similar research on Jahai.

The lack of figurative language in the domain of perception may be traced back to the small-sized, specialized corpora of a certain genre. Though this might be beneficial when looking at individual examples, it might not uncover the entire depth of the vision verbs. Nevertheless, the examples provided in this thesis, in particular example 35-36, do illustrate the importance of vision in human cognition.

In line with San Roque et al. (2015), vision verbs in the corpus showed little "cross-linguistic consensus about their object" (p. 19), as is illustrated in the semantic map on p. 33. This further supports the dominance of vison in these languages, as it is prone to semantic extension and not as restricted as other sense modalities. Larger and more representative corpora of the languages could likely change the outline of the concept of vision in these languages, and

scrutinizing the possible targets of perception of the other sense modalities would provide us with a broader understanding of the hierarchy of the senses and the dominance of vision in olfactory speech communities.

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9 Appendix I

9.1 Project archives used

Project:	Collected by:	Language:
Documentation of Ceq Wong	Kruspe 2002-2003	Ceq Wong
Semang	Burenhult 2002, 2005-2006	Jahai
LACOLA	Burenhult 2012	Jahai
Documentation of hunter-gatherer languages in contact: Semaq Beri and Batek of Peninsular Malaysia	Kruspe 2008	Semaq Beri
Singing spiders, sobbing stones: a linguistic exploration in the representation of sound in the Aslian languages of the Malay Peninsula	Kruspe 2016, 2017	Semelai
Personal field material	Kruspe 1990-1991	Semelai

1.1 Nodes in RWAAI

Language	ID	Name of file in RWAAI	Duration	Date of recording	Handle
Jahai, jhi	1	Blan2	00:08:20	2012-02-25	http://hdl.handle.net/10050/00-0000-0000-0003-B94D-0@view
	2	NarrLandscape1	00:08:45	2002-11-16	http://hdl.handle.net/10050/00-0000-0000-0003-FB72-B@view
	3	NarrLandscape2	00:30:36	2002-11-16	http://hdl.handle.net/10050/00-0000-0000-0003-FB79-0@view
	4	NarrMem4	00:04:08	2005-07-09	http://hdl.handle.net/10050/00-0000-0000-0003-FBC9-9@view
	5	NarrMem7	00:13:34	early 2000	http://hdl.handle.net/10050/00-0000-0000-0003-FBC5-A@view
	6	NarrMem9	00:05:24	early 2000	http://hdl.handle.net/10050/00-0000-0000-0003-FBCA-1@view
	7	NarrMem10	00:16:27	early 2000	http://hdl.handle.net/10050/00-0000-0000-0003-FBC7-6@view

	8	NarrTrad1	00:12:29	2007-03-29	http://hdl.handle.net/10050/00-0000-0000-0003-FB22-A@view
	9	NarrTrad2	00:04:18	2007-03-29	http://hdl.handle.net/10050/00-0000-0000-0003-FB26-C@view
	10	PoisonMyth	00:06:58	2006-03-17	http://hdl.handle.net/10050/00-0000-0000-0003-FB18-C@view
Ceq Wong, cwq	1	The_Story_about_Bayek_River_200824	00:06:00	2002-06-05	http://hdl.handle.net/10050/00-0000-0000-0003-F436-9@view
	2	The_Story_of_Young_Man_Bires_final	00:28:56	2003-09-03	http://hdl.handle.net/10050/00-0000-0000-0003-F437-4@view
	3	The_Story_of_the_LongTailed_Macaque_NK200824	00:25:50	2002-07-17	http://hdl.handle.net/10050/00-0000-0000-0003-F44A-2@view
	4	The_Story_of_the_Nocturnal_Insect_final	00:23:19	2002-07-17	http://hdl.handle.net/10050/00-0000-0000-0003-F45E-9@view
	5	The_Story_of_the_Frog_Woman_NK_200824	00:09:42	2002-07-17	http://hdl.handle.net/10050/00-0000-0000-0003-F447-7@view
	6	The_Story_of_the_Dog_Man	00:07:34	2002-07-15	http://hdl.handle.net/10050/00-0000-0000-0003-F445-4@view

	7	The_Story_of_the_Swiddeners_final	00:06:04	2002-07-17	http://hdl.handle.net/10050/00-0000-0000-0003-F45A-5@view
	8	The_Story_of_the_Tree_Fall	00:05:45	2002-06-05	http://hdl.handle.net/10050/00-0000-0000-0003-F43C-2@view
Semelai, sza	1	Rajaq_bawong	00:10:45	1990-11-28	http://hdl.handle.net/10050/00-0000-0000-0004-1115-3@view
	2	smaq_khbes_bknon_I	00:08:42	1991-03-00	http://hdl.handle.net/10050/00-0000-0000-0004-111C-1@view
	3	smaq_cmburuq	00:07:41	1991-04-02	http://hdl.handle.net/10050/00-0000-0000-0004-1122-2@view
	4	smaq_gqgoq	00:05:00	1991-04-02	http://hdl.handle.net/10050/00-0000-0000-0004-1136-D@view
	5	smaq_paqreq	00:13:23	1991-04-01	http://hdl.handle.net/10050/00-0000-0000-0004-1132-1@view
	6	smaq_pnon	00:08:30	1991-04-02	http://hdl.handle.net/10050/00-0000-0000-0004-1130-2@view
	7	smaq_qimiskin	00:21:29	1991-01-29	http://hdl.handle.net/10050/00-0000-0000-0004-112C-2@view

	8	smaq_rabon	00:09:16	1991-04-02	http://hdl.handle.net/10050/00-0000-0000-0004-1131-3@view
	9	SZANKVF160702_151046	00:08:10	2016-07-02	http://hdl.handle.net/10050/00-0000-0000-0003-CF15-C@view
	10	SZANKVF170717_101247	00:12:21	2017-07-17	http://hdl.handle.net/10050/00-0000-0000-0004-1AE5-1@view
	11	SZANKCR910518 Fleeing the Japanese	00:11:41	1991-05-18	http://hdl.handle.net/10050/00-0000-0000-0004-1171-C@view
Semaq Beri, szc		SZCNKDV081011_2	01:00:04	2008-10-11	http://hdl.handle.net/10050/00-0000-0000-0004-0982-0@view
		SZCNKDV080719_1	00:52:40	2008-07-19	http://hdl.handle.net/10050/00-0000-0000-0004-0990-7@view

10 Appendix II

Jahai: ʔɛl

Human
plɛs dɔk, plɛs dɔk, plɛs dɔk, ca=ʔɛl k=pay...
to.smear ipoh to.smear ipoh to.smear ipoh HORT=to.look LOC=2S.DIS
'smear poison, smear poison, smear poison, look at you...' (jhi:10)

Place
ca=ʔɛl ba=ʔaniʔ
HORT=to.look GOAL=DEM
'look that way' (jhi:8)

Event
tɔm wɔŋ ʔhəy, yɛʔ ʔɛl, jĩp, jĩp, jĩp, jĩp, jĩp, jĩp, jĩp
water child small 1S to.look drip-drip-etc
'a small rivulet, I looked, drip, drip, drip, drip, drip, drip, drip' (jhi:3)

Concrete
taniʔ lɛh, məh ʔɛl X hayɛ̃ʔ yɛʔ, ʔoʔ deʔ nɛy k=ton
DEM EMP 2S.FAM to.look X house 1S, 3S to.make one LOC=DEM
'there, you can see my house, he built one there' (jhi:7)

Ceq Wong: daŋ

Human
ʔu= cɨp daŋ pon kaʔ biʔ bəntəriʔ.
3sg= go look.at too LOC person deputy.headman
'He went too to look at the official.' (cwq:2)

Animal
ʔu= daŋ ʔɛ̃ŋ.
3sg look.at dog
'He looked at the dog.' (cwq:2)

Concrete
daŋ kaʔ hyãʔ
look.at LOC house
'(I) looked at the house' (cwq:8)

Event
daŋ teʔ wek kaʔ hyãʔ daŋ məhə̃m cɑs teʔ
look.at 3du return LOC house look.at blood hand 3du
'He watched them go home, looked at the blood on their hands.' (cwq:2)

Abstract
daŋ kɑʔ nəŋ, ʔu= wek kaʔ hyãʔ
look.at PERF be.long.time 3sg return LOC house
'Seeing it had been a long time, he went home.' (cwq:3)

Ceq Wong: yow

Human
tuŋkal həʔ pənãh kun yow
man NEG:exist ever IRR see
‘As if you'd never seen a man.’ (cwq:7)

Animal
lər nə-yow talon.
then NMZ-see snake
‘Then we saw the snake’ (cwq:1)

Event
yow biʔ nawar jərat teʔ dias.
see person NMZ:set.barricade trap 3du follow
‘Seeing people setting a barricade for a trap, they two followed.’ (cwq:2)

Concrete
ʔu=yow bukɑʔ haliʔ məhaŋ nũʔ
3sg see open leaf taro.sp that
‘He saw the *mehang* leaf and opened it.’ (cwq:8)

Semelai: jŋɔʔ

Human
ki=cŋɛw la=bapaʔ jŋɔʔ dom knɔn kdor
3A= look.down A= father look.at AFF offspring be.female
‘The father looked down, looked, yes, it was a girl.’ (sza:2)

Animal
ki=blɒ-blɒy ma=jŋɔʔ tupay ʔoʔ
3sgA=RDP-look.up IRR=look.at squirrel oh
‘She looked (and) looked up (and) looked at a squirrel "oh!"’ (sza:6)

Place
ʔen sawɛl satɒm daʔ b-jŋɔʔ
LOC left right NEG MID-look.at
‘Not looking left or right.’ (sza:7)

Concrete
dɔs mntuhɒʔ=hn ki=jŋɔʔ lɒc cgoʔ dlɔŋ pat^{h}ir
reach parent.in.law ABS= 3A look.at PERF deep tree tree.k.o
‘When his father-in-law arrived, he saw (the incision) in the pat^{h}ir tree was already deep.’ (sza:4)

Event
staʔ ronoŋ de=jŋɔʔ ʔyot
after mid.afternoon 3plA= look.at return
‘Then mid-afternoon they watched (him) return.’ (sza:5)

Semelai: ʔye

Human
kɪ=ʔye knləkˈ
3A= see husband
‘The husband saw her.’ (sza:2)

Animal
trye ci kapɔh ci ki=ca
HAPP- see louse egg louse 3A= eat
‘seeing a louse (or) nit, she ate (it).’ (sza:2)

Event
yɒʔ mə=yɛ=ʔye ji=kʰɛʔ mə=daʔ kke pər tet ke pər tet nɔʔ
but REL= 1A= see 2A= know REL= EXIST that fly TO:spec that fly TO:spec this
‘But what I saw, you know, that thing flying here and flying there’ (sza:10)

Concrete
ʔoooh ji=ʔye grcɛ̃ŋ yɛ
EXCL 2A= see small.hair.standing.up.straight 1SG
‘Oooh can you see my hairs standing on end?’ (sza:10)

Semaq Beri: nɔ̃t

Human
hɛ=nɔ̃t nalɨʔ hɛ
1plINCL=look companion 1plINCL
‘We look at our companions.’ (szc:1)

Animal
kɛ nɔ̃t balɑːʔ sipot [HES] ʔanũʔ haʔ sala dlɔŋ təʔ
3sg look.at be.many snail HES LOC leaf tree that
‘He looked at the many snails umm on the leaves of the tree.’ (szc:2)

Place
nɔ̃t hnɔ̃ʔ cukop kərtiʔ ʔiwãʔ ʔəɲ hnɔ̃ʔ
look.at this be.enough understanding offspring 1sg this
‘Look here my children understand it sufficiently.’ (szc:1)

Event
hɛ nɔt lah sipot təban kɛ swak di=təʔ
1plINCL =look EMP snail move.over 3SG move like=that
‘We'll watch the snails move over it when they go like that.’ (szc:2)

Concrete
hɛ nɔ̃t daʔ kapur nɔ̃ʔ, kapur haʔ mɔ̃t, tnũt kɛ təʔ
1incl look.at exist lime this lime LOC eye mouth 3sg that
‘We see there is this lime, lime on its eyes and mouth.’ (szc:2)

Semaq Beri: (da)ʔye

Human
ʔanũʔ nɔ̃ʔ lah, kɛ kɔy, kɛ daʔye lɑc gayaʔ kɛ gaʔ swak, kɛ kɔy
HES this emph 3sg follow 3sg see PERF grandmother 3sg IMM go 3sg follow
‘Umm, this one, he followed, he had seen his grandmother was going and he followed.’ (szc:1)

Event
təʔ jmatam təʔ ʔəɲ daʔye gi jʔɔy
that bridge that 1sg see 3pl make
‘That bridge there, I saw them build it.’ (szc:1)

Concrete
gi jok gaʔ bri təʔ nɛ̃ŋ, beh gi daʔye syok gi
3pl move.camp to forest forest that PST:PROX NEG 3pl see track 3pl
‘They had decamped to forest earlier, they didn't see a trace of them.’ (szc:1)

Visual ability
ʔah təʔ, ladaʔ, beh kɛ=ʔye lah
EXCL that chilli NEG 3sg see EMPH
‘Ah, because of the chilli, he couldn't see.’ (szc:1)