

**The unfolding of Roads and Pipes: A Cognitive Linguistic
study of Non-actual Motion descriptions by Khasi-English
bilinguals**

*A Thesis Submitted to the University of Hyderabad in partial fulfilment of the Requirement for
the award of*

Doctor of Philosophy

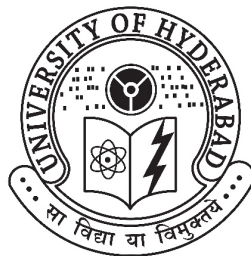
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BY

MARANATHA GRACE T WAHLANG

11CCPC03



Centre for Neural and Cognitive Sciences

UNIVERSITY OF HYDERABAD

HYDERABAD - 500 046

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DECLARATION

I, Maranatha Grace T Wahlang (Reg.No. 11CCPC03) hereby declare that the work embodied in this dissertation entitled “The unfolding of Roads and Pipes: A Cognitive Linguistic study of Non-actual Motion descriptions by Khasi-English bilinguals” submitted under the guidance of supervision of Prof. Prajit Kumar Basu and Prof. Surampudi Bapi Raju, is a bonafide research work whcih is free from plagiarims. I also declare that it has not been submitted in part or in full to this University or to any other or any other institution for the award of any degree or diploma.I hereby agree that my thesis can be deposited in Shodhganga/INFLIBNET.

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Maranatha Grace T Wahlang

11CCPC03

Signature of the Supervisor

Prof. Prajit K Basu

Signature of the Co-Supervisor

Prof. S Bapi Raju

Head

Centre for Neural and Cognitive Sciences

Dean

School of Medical Sciences



**Centre for Neural and Cognitive Sciences
University of Hyderabad**

CERTIFICATE

This is to certify that **“The unfolding of Roads and Pipes: A Cognitive Linguistic study of Non-actual Motion descriptions by Khasi-English bilinguals”** submitted by **Maranatha Grace T Wahlang** bearing registration number **11CCPC03** in partial fulfilment of the requirements for the award of Doctor of Philosophy in the Centre for Neural and Cognitive Sciences is a bonafide work carried out here under our supervision and guidance.

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Parts related to this thesis have been published in the following:

1. Wahlang, Maranatha Grace T Wahlang and Koshy, Anish. 2018. Descriptions of co-extension paths in Khasi. *Journal of the South East Asian Linguistics Society*, 11(2): 40 -65.

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Course Code	Name	Credits	Pass/Fail
CO801	Formal and Computational Approached to Cognition	4	Pass
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CO828	Supervised and Unsupervised learning in NLP	4	Pass
CO829	Signal Processing	4	Pass

(Prof. Prajit Kumar Basu)
Supervisor

(Prof. Surampudi Bapi Raju)
Co-Supervisor

(Prof. Ramesh Kumar Mishra)
Head
Centre for Neural and Cognitive Sciences

(Prof. P. Prakash Babu)
Dean
School of Medical Sciences

To Lam and Jo, Khublei

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Abbreviations	Full forms
1SG	First person, Singular
3FSG	Third Person, Feminine, Singular
3MSG	Third person, Masculine, Singular
3PL	Third person, Plural
ABL	Ablative
ALL	Allative
ACC	Accusative
CL	Classifier
COM	Commitative
CONJ	Conjunction
DEI	Deictic
DIM	Diminutive
DIST	Distal
FM	Fictive motion
FOR	Frames of Reference
FUT	Future
GEN	Genitive
HAB	Habitual
IMI	Imitative
INF	Infinitive
EXTERIOR	Region-exterior
INTERIOR	Region-interior
INVISIBLE	Invisible (deictic)
LOC	Locative
NAM	Non-actual motion
NMZ	Nominaliser
NON.HUM	Non-human
PROX	Proximal
PST	Past
REL	Relativiser
REP	Repetitive
DE+Aff	Depth ,+afford human motion
DE-Aff	Depth, -afford human motion
AE+Aff	Across, +afford human motion
AE-Aff	Across, -afford human motion

Abstract

This thesis reports the study of Non-actual motion descriptions in two sample populations, both of which speak Khasi and English as their dominant languages. Non-actual motion refers to the experience of potential motion of static and extended objects such as pipes, roads, wires and fences and the use of motion verbs to describe this property of extension in Language. The thesis explores two aspects of Non-actual motion - the underlying factors that lead to the use of Non-actual motion descriptions and the language resources that are deployed by the sample populations to describe the same, in Khasi and English. The data is obtained through an elicitation experiment, involving a total of 32 images for every participant. The sample populations were tested for the role of enactive motion as a primary motivator for the experience and use of Non-actual motion. The analysis of the behavioural data was done in R Statistical Analysis, using glmer in the lme4 package. The analysis of the linguistic data was done using the Holistic Spatial Semantics framework, along with the the typology of Non-actual motion proposed by Dr. Johan Blomberg. In addition, the motion verbs were also analysed for the kind of information they encode in addition to motion: manner, path and direction. Spatial information as encoded in other parts of speech - adverbs, prepositions, case markers, deictic markers were additionally analysed and compared between the two languages.

The results show that the affordance of motion on the objects investigated have a statistical significance in the use of Non-actual motion descriptions, pointing in the direction of having an effect in our experience of potential motion on these objects. The thesis did not find enactive motion to be the primary motivator for the use of Non-actual motion descriptions in both populations, in both the languages.

Linguistically, Khasi and English were found to be similar in that they both had very high instances of the use of a bleached motion verb to express motion and to encode path in a satellite. However, Khasi showed a much higher amount of additional information about path as well as body configuration of the objects, which comes under the non-actual movement information, as proposed in Blomberg's typology. In addition, there is a difference in the most frequent types of verbs used by the participants in their two languages, where they use

entry/exit verbs frequently in Khasi but not in English. The thesis proposes further studies in other Monkhmer languages in the future. In addition, it also sees a need for models built for a multilingual population like the ones in South Asia, which would account for language contact, multilingual childhoods and incorporating the notion of South Asia as a Linguistic area, in order to better explain some of the results from the data found in this thesis.

Chapter 1

Introduction

We are surrounded by objects of many different shapes, sizes, colours and textures. They come in various states - liquid, gaseous or solid. Some of them are mobile, while others are not. Objects also occupy space in different ways, depending on their size and shape. Their relationship with each other vary depending on the features they have - some objects contain other objects, some objects are in contact with each other while others are not, and some objects might be in motion and relate to each other through motion. In our everyday navigation of the world around us, we perceive different kinds of objects, react to them according to the need that we have and talk about them with people around us. The ways in which we perceive objects and their relationship to us and to each other, stands as an essential part of our cognitive abilities. We can say that spatial cognition is a fundamental ability to animals and human beings. It enables us to move, to plan our movements and to converse with each other about locations, movements and other spatially related discussions. The importance of this faculty is seen in our usage of spatial terms to describe other experiences in life - love, money, time , amongst many other things. For example, we talk about prices rising, about feeling down, about falling in love, about time flying, especially while doing a PhD.

This thesis is interested in a very specific kind of object property - that of extension. Many of the objects that we encounter in our lives are extended and may cover more than one background. An easy and simple example to think of is a road or a path. If our figure is a road or a pathway, it has the property of extension, in that it goes on for a certain amount of length and will possibly traverse more than one background object. To give a clearer distinction between an object with extension and one without, lets look at the relationship between a cup on a table vs a road that extends alongside a river.

If we think of the relationship between a cup on a table, we can say that the relationship

between them is congruent, in that the object is on the table. The cup occupies a defined and individuated space, both in our visual field and in relationship to the table. If we take a road in relation to a river on the other hand, the relationship has potential for incongruency. For instance, the road might run along the river for a certain amount of time and then turn towards mountains that are to its right. From there on the road can extend into the mountains, with a possibility of going beyond them. Of course the context matters in comparisons like this one. So, if we have a new Television, which extends across the wall of our living room, the relationship between the wall and the TV would differ from an older television that is a small box. Similarly, If we zoom out of a map, a road that went from one area to a neighbouring area might lose the property of extension and become a dot in the array of dots that make a line. Such physical properties and contexts are important to our perception of extension but are beyond the scope of this thesis. What this thesis looks at is more of a given, shared and explicit extension, let us say an image of a road or a pipe that would not vary from person to person. In such cases, how do we talk about this property?

Our communication with other people needs to be able to express the property of extension in an economic way and in ways that do justice to what we see. Take an example of an experience of walking on a road from points x to y . Let us imagine that a person gives directions to a stranger or someone who does not know the way from point x to point y . It is obvious that the descriptions of walking and of the traffic might include verbs of motion like ‘be careful of bikes going in the wrong side of the road’ or ‘even if you go slowly, it should not take you more than ten minutes to get there’. However, if we look carefully, the words this person uses to talk about the road or path itself will also very likely include the use of motion verbs. The person might describe the way from x to y as ‘so you take this road, in about 300 meters, it turns left, take the turn and then you’ll reach an intersection. Go straight across and continue. After another 300 meters, the road branches into two, take the left branch which goes around a park. After about 500 meters, you’ll see y ’. In this description, people are not the only ones in motion, but the road is moving as well: turning left, branching into two, going around a park. In fact our language about extended objects quite often includes motion words to describe this property. Take for example, the following description from Amitav Ghosh’s ‘Countdown’.

The site where India’s nuclear devices are tested lies close to a major national highway. This road *runs* most of the way through the state of Rajasthan, *extending* well into the Thar desert. The last stretch of the highway *connects* the old palace town of Bikaner to the fairy-tale desert fortress of Jaisalmer – a major tourist des-

tion. (Ghosh, 1999:1, my emphasis)

This extract, from the introduction of his book, starts with a description full of motion expressions for a non-animate, non-mobile object – the highway. The national highway runs, extends and connects, verbs which are used in conjunction with prepositions through, into and to. Sometimes this dynamism is not only expressed through motion verbs but through a collocation of different phrases, which when taken as a whole, give rise to a sense of motion or non-staticity. Take for instance the following:

‘This was the Old Chief’s Country’, he said. ‘It *stretched from* those mountains over there *way back to the river*, hundreds of miles of country.’ That was his name for our district: ‘The Old Chief’s Country’; he did not use our name for it – a new phrase which held no implication of usurped ownership.

(Doris Lessing, 2003:17, my emphasis)

Whenever directions ‘from- to’ are used, there is a sense of continuity that an extended object can have. However, even if we stick to expressions containing motion verbs, we intuitively share an understanding of the differences between the following:

1. National highway 44 runs all the way from Srinagar to Kanya Kumari.
2. Bus number 216 goes from Koti to Gachibowli.

We know for instance that objects like roads are immobile, unlike cars and bicycles and most animate objects. On the surface of it, these descriptions seem to straddle the gray area between literal and figurative speech, allowing immobile objects to act as nouns that can be used with dynamic verbs like run and go. If we look a little deeper, however, we find that such descriptions give us information about directions and dynamicity.

3. The mountain range goes all the way from Mexico to Canada.
4. The mountain range goes all the way from Canada to Mexico.

(Talmy, 2000:104)

5. The road inched uphill.
6. The road plunged downhill.

(Rojo and Valenzuela, 2003:130)

As we can see, in 3) and 4), the direction of the figure, the mountain range changes against the background of the countries that it traverses on. 5) and 6) on the other hand give us information about the slope of the road as well as the vertical direction. When we say the road ‘inched’ uphill we get or give information about the steepness of the slope and similarly the verb ‘plunge’ in 6 tells us that the same road when looked at from the top looks like it plunges. The use of ‘inch’ and ‘plunge’ in these sentences is very different from the use of ‘inch’ and ‘plunge’ in a metaphorical sense as in 7) and 8).

7. I did not realize that I was inching my way towards a career disaster.

8. After many years, we finally decided to take the plunge and get married.

In 7 and 8, ‘inch’ and ‘plunge’ are metaphors that are mapped on from spatial translocation to life events that take place on a temporal scale, unlike 5) and 6), where it is not very clear if the verbs are mapped on from one domain to another. In 5) and 6) we could of course argue that ‘inch’ and ‘plunge’ is used to talk about the time it would take to go up the road and in that sense there is a mapping from the domain of space to time. When intentionally used to highlight some aspect of the path, metaphors can be used; however this is not always the case as we can see in 1) - 4). We could also argue, that ‘inch’ and ‘plunge’ in 5) and 6) give us information about the slope and is not used as a metaphor, which we will look into as we go further into these expressions. What is interesting is that motion verbs in 1) - 4) are used for situations that have no movement at all, in fact we have from – to constructions and directionality with no motion.

What the motion verbs seem to do is to express characteristics of objects that are not individuated, or clearly demarcated in relation to the other object(s) that they are spatially related to. The use of motion verbs looks more like an attempt to do justice to our perception of extension. In fact, for some objects, like roads and landscapes, there is a potential of indefinite continuity, in the sense of the object extending well beyond our visual field. If we think for instance, of a road next to a river, we can say, ‘this road runs all along the river’. This extension of the road, while having an finite distance, when compared to individuated objects in the scale of things that we see in our visual field, has the potential for indefinite continuity. The question is “what is it about extension that we try to do justice to through motion verbs?”. This thesis will explore existing theories that try to explain the use of motion verbs to describe extension, as part of a general cognitive mechanism that every human possesses. Secondly, is this use of motion verbs found in all languages or in many languages? I will also explore this through an analysis of the linguistic data given by Khasi-English speakers and compare the data to available linguistic data in other languages and their typologies.

1.1 Why use ‘run’ to describe a static road?

In 1), 2), 3) and 4), the use of motion verbs is not necessarily metaphorical. Do the objects being talked about, or the subject nouns in the sentences belong in the category of motion or in the category of static objects? On the surface of things, we can of course say they are static objects, since they are not in motion. However, motion is not necessarily objective. We do not experience “motion” when the earth rolls around the sun in the solar system, we experience this motion through the passage of time instead. We experience the motion of a bus, a car or a plane, when we are really just sitting in these objects but we do experience movement while jumping up and down, even if we do not move from one place to another. What is happening perceptually when we describe static objects using motion verbs? In his introduction to his study of motion, Johan Blomberg distinguishes, amongst other things between *inner* and *outer* motion, and *lived* and *observed* motion (Blomberg, 2014). Inner motion refers to the experience of motion without displacement, that which we experience when we jump up and down, while outer motion refers to displacement, when we change locations with reference to another object. Lived motion is motion experienced from our perspective and potential for self-motility as observers of objects around us, whereas observed motion is the motion that we observe in other objects around us (Blomberg, 2014). He argues that our use of motion verbs in describing static objects arises partly from lived motion - there is a potential of motion with objects that unfold to us through our experiences of them as beings who move not just our bodies but different parts of our bodies to perceive an object. In Chapter 2, I will go through a more detailed review of Blomberg’s idea of lived motion and how it relates to the use of motion verbs for static objects. The chapter will also give an outline of the other theories about the same, with an attempt to add to them aspects of depth perception as a motivator for the use of motion verbs for static objects.

1.2 Extension and motion

The current literature on motion verbs found in descriptions of static objects is generally studied vis-a-vis studies of motion events. Terms that are used for this phenomenon hence include *fictive motion* (henceforth FM) (Talmy, 1996), *subjective motion* (Matsumoto, 1996), *abstract motion* (Langacker, 1990) and *non-actual motion* (henceforth NAM) (Blomberg, 2014). A contributing factor to this approach is the empirical evidence that we now have - of an experience or a potential for an experience of motion, when one interacts with such objects (Matlock 2004, 2011; Blomberg, 2014). Studies in Cognition of FM or NAM therefore place FM against actual

motion. The beginnings of this project on FM, started with Talmy's pioneering work, 'Fictive motion in Language and cognition' (Talmy, 1996), which as the name suggests, looks at the interaction between language and other cognitive faculties, giving rise to FM. Since we talk about these objects and the entry point into this exploration was through language, it is intimately tied to language and the perception of motion. Beginning with this seminal work of Talmy (1996), this phenomenon was explored in the broader area of Cognitive Linguistics. While some studies look at the possible motivations for the use of FM (Talmy, 1996; Langacker, 1996; Matlock, 2004, 2011; Blomberg, 2014), there have also been explorations through cross-linguistic, stimuli based studies. Typological studies follow Talmyan semantics of verb-framed and satellite framed languages in their categorisation of languages, which include Spanish, Estonian, Mandarin, Swedish, English, Thai and French (including Talmy, 1996; Matsumoto, 1996; Rojo and Velenzuela, 2003; Taremaa, 2013; Blomberg, 2014; Ma, 2016; Stosic et al., 2015). It was only with Blomberg's study across languages belonging to different motion-event typologies that we now have a typological framework specifically proposed for Non-actual motion descriptions (Blomberg, 2014). However, the method of studying the linguistic aspect of it was built on tools that were designed to study motion events.

Motion event is part of a bigger field of spatial cognition and spatial grammar. These fields now occupy an important place of their own in Cognition for several reasons. One, as Lakoff and Johnson pointed out (Lakoff and Johnson, 1999; Lakoff and Johnson, 2003), we use our bodies and their configurations in relation to other objects, to talk of many other aspects of life - love, time, inflation of prices and so on. This mapping of concepts from spatiality is separate from the general importance and primacy of space and spatial reasoning that affects every other facet of human thinking from movement to geometry. In the study of motion events, the other fundamental objects are the Path of motion and the Manner of motion. The Path, as the name suggests, tells of the path that the figure takes in relation to the ground. Motion descriptions can also encode information about the source and goal of the moving figure. Examples of *path* verbs are - exit, enter, pass. Manner refers to the way in which the object moves along the path. Examples of *manner* verbs are - run, walk, trot, slide, float. Typologically there has been attempts of classifying languages into the kind of information the verb conveys. If the verb conflates motion with path information, the languages are classified as verb framed languages and if the information about path is encoded in prepositions or adverbs, the language is classified as satellite framed languages (Talmy, 2000). This classification is not as simple and straightforward as it seems of course and has been challenged and augmented by scholars like Slobin (Slobin, 2004), Zlatev and Yangklang (2004), John Beavers, Beth Levin and Shiao Wei Tham (Beavers, Levin and Tham, 2009).

Using the Talmyian typology and Blomberg's typology on motion verbs and Non-actual motion, respectively, an analysis of Khasi descriptions of static extended objects will be performed, in Chapter 3. The thesis will explore the kind of information about *Path* and *Manner* that Khasi encodes in Non-actual motion descriptions. This will be executed through an elicitation experiment in Khasi and the results are reported in chapter 3. The same experiment will be reported with the same sample population, with the difference being that they will be asked to only speak in English. A report of their English descriptions will be made in chapter 5. In addition to the typology, the experiments will also test the different proposed cognitive motivations for the use of motion verbs to describe extension. The experiments are a replication of Blomberg's work on Non-actual motion experience and descriptions, which was designed and performed with Thai, French and Swedish speakers by Blomberg (Blomberg, 2014).

1.3 Exploring cognition and language

So far we have looked at examples in English, which is one of the most studied languages and upon which many of the current theories are based. However, quite early on, as early as Schlegel, Herder and Humboldt (see Brown, 1967), there has been a recognition of the importance of comparative grammar studies in the scientific quest of understanding Language albeit written in tones that can be interpreted as problematic ¹ in today's world. As Lucy says, it is important to explore the ways in which different languages choose to pay attention to different elements in the world around us. This is important to look at because the way in which people talk can give us a hint of how languages for historical reasons choose and pick elements to focus on. Although a cross-linguistic structural study is difficult to implement because it demands resources and extensive fieldwork, it is nevertheless an important task.

Comparing categories across languages requires extensive linguistic work in terms of both local description and typological framing, can be derailed by blindness to categories very different from one's own, and may not easily yield referential entailments suitable for an independent assessment of cognition. Nonetheless, this strategy holds the most potential for closely respecting the linguistic differences and thus holds the greatest promise for identifying structural differences and directing the search for cognitive influences in appropriate directions.

(Lucy, J., 2011:49)

¹these scholars mapped the differences of language type onto people types or into nations: hierarchically.

The comparative studies of grammars is a huge project, within which we find the study of spatial grammars (including motion event descriptions). Spatial grammar studies in particular has taken on the yoke of correlating grammar to cognitive processes (Levinson and Wilkins, 2006) and have contributed an immense amount of information about the different ways in which languages talk about objects and about the ways people position themselves in relation to the world and to objects around them.

One of the main theoretical thrusts for this project comes from the much debated Sapir-Whorf Hypothesis, which is actually a hypothesis posited by Roger Brown and Eric Lenneberg (1954) and based on misunderstood ideas of Whorf (Pavlenko, 2016). It has been debated that the psychological caveat used by Brown and Eric Lenneberg steered this project away from Whorf's intention of questioning the bias of Indo-European languages on scholars and their scientific theories. The idea that Whorf had, the reason for his insistence on the importance of non Indo-European languages and their study, was to reflect on the linguistic and scientific claims being made about Language and thought at that point in history (Lucy, 2011; Pavlenko, 2016). This project calling for cross-linguistic studies to be the basis of scientific theories about Language and Cognition has recently been revived through the study of non-Indo-European languages and multilinguals. It is in this sub-field that I attempt to situate this thesis, through experimentally elicited descriptions of extended objects, given by multilinguals who speak Khasi and English as their dominant languages.²

Multilinguals (I use this term to include bilinguals) are important for the study of Language and thought because in a multilingual we can test whether the different languages interact with each other (cf Pavlenko, 1999). The importance of Language vis-a-vis Thought (and Thinking) has been a gruelling topic for thinkers and scholars. While this question itself is beyond the scope of this thesis, I nevertheless touch on this question through the study of bilinguals. Questions asked about the relation between thought and language have often been formed through treating them as separate units. The question is whether the unit of thought precedes the unit of language, whether they appear contemporaneously or whether the unit of language comes before the unit of thought and sets a limit on thought (Brown, 1967). To some the relationship between the two are so intimate that it is hard to differentiate between them, and more importantly, it is biological and innate and shared across all cultures. The differences between languages is noise and does not affect thought (Quine, 1960; Chomsky, 1959). Other thinkers have submitted and proposed the effect of language on thought. Humboldt saw thought and language and co-originating and of thought as existing separately from language, but he

²These are the only languages that I investigate, however, my participants also have other language modes that are beyond the scope of this thesis.

nevertheless asks the questions about the restrictions that language can have on thought. Brown states that for Humboldt, the grammatical tendencies of a language inhibits thoughts (Brown, 1967). In a more recent work, Slobin (1987), through a study of motion events, introduced the concept ‘Thinking for speaking’. He looked at how speakers of different languages, chose different elements of motion to speak about. This difference was not random and it looked like the language that was spoken had a role to play in what these speakers chose to focus on. In addition, what needs to be addressed is how language is socio-culturally contextualised (Zlatev, 1997; Blomberg, 2014; Lucy, 2011). We cannot prying apart language from culture. For instance, we cannot deny that our experience of aesthetics and taste is affected very much by what we are told is beautiful and tasty and so on. Languages themselves are also stratified into class/caste and other political constructs. So a language, say, Telugu spoken by Dalits in India might have similar sociopolitical contexts as languages, say English or French spoken by other minority groups, giving rise to certain shared concepts that are built with and through language. Such cultural contexts affect our categorisation processes, like the affordability of human motion on objects, a topic which will be discussed in more detail in Chapter 3. To say that the language one speaks affects one’s embodied experience of the world is not very distant, once we see language as socio-culturally contextualised. This is not to deny that non-linguistic cognition exists as such, as shown in research with primates and birds. For instance, bottlenose dolphins and monkeys (Smith, J D., 2003), show similar usage of uncertainty as a choice when confronted with tests where they had to evaluate their own cognitive capacities in order to succeed. The question is not whether language exists as an independent faculty separate from thought. It is rather to ask whether the process of speaking might affect what we choose to think about.

A syntactician following Chomsky’s framework can of course argue that social ramifications of linguistic conventions fall outside the range of Language and that the study of it should be abstracted away from the sociopolitical. Even a semiotic approach to Language, like the one given by Saussure, share this abstraction of structure and attempt to study Language as a purified or dualistic essence. On the other side of the fence, scholars like Levinson (2003) have tried to show that the language we speak an effect on our perception of space. Whether or not this is true, and to what extent is beyond the scope of this research, however, through a study of Khasi - English bilinguals in both their language modes, I will try to look at two things. One to give a detailed description of how Khasi speakers use motion verbs to describe static objects in both their language modes, and compare the data to existing data from other languages. These studies are important, because they lay the groundwork for a comparison between what is shared and what differs between languages (Lucy, 1997). It is also important

to a study of fictive motion because as pointed out by Slobin (1987) languages choose what features or elements of motion are focused on and highlighted for communication. Secondly, I adopt the Grosjean approach to bilingualism in that it attempts to escape from treating participants as monolinguals who speak additional languages (Grosjean, 1999). Although it is difficult to take into consideration the other languages that speakers might speak, it accepts the theory that regardless of competency in the different languages, a bilingual's or monolingual's processing of events is necessarily changed by the existence of two or more languages (Brown, 2015). The theory of conceptual transference, convergence and restructuring (Jarvis, 2011; Jarvis and Pavlenko, 2009; Pavlenko, 2009) will be explored in chapter 4, as part of bilingual and bilingualism models that can be used to understand language use in the sample population in this thesis. The models of semantic transference, convergence and restructuring, refers to the transfer of concepts from one language to another (can also be bi-directional), convergence of concepts and the restructuring that occurs in a bilingual's lexical storage system. It is important to note here that a system like this one treats lexical items in two languages as potentially having different concepts, which they do not share. It is at the level of concepts that restructuring occurs in a bilingual.

1.3.1 Positioning the research

Crucial to this whole debate is the position of the researcher herself and the influence that a language(s) has on what is chosen as the language or standard that experiments in other languages are compared to (Sapir, 1929; Lucy 2011; Pavlenko 2016). Where do I as a researcher stand and what are the tools, methodologies, stimuli and theories that I use to explain the data derived from my experiments? Given that the language context in a country like India is multilingual and does not tend towards homogeneity (i.e. education is not necessarily in the mother-tongue and there is a state driven education for at-least three languages), how do the theories arising from homogeneous English speaking communities, with formalised education in Second languages apply to the data here? In chapter 4, I will report an experiment in the Khasi-English speaking sample population, in their English mode. I will also explore the various theories regarding bilinguals and bilingualism and present a qualitative analysis of the kinds of descriptions given by the participants to describe the same set of stimuli as in chapter 3.

1.4 Language Context

In this section I will briefly present the language context that the sample population comes from. In addition, I will also present a general introduction of the languages that I will investigate in this thesis.

1.4.1 The multilingual context of participants

The inclusion of a multilingual study in this thesis is a result of the background checks conducted before running the experiment amongst the Khasi sample population. The groups that I am looking at are a migrant student population, like many of the student populations across universities in India. The sample populations in this thesis are all migrant, having moved from Shillong, Meghalaya to Institutes for higher education in the cities of Hyderabad, Bangalore, Kolkata and Delhi. While most of them are students, some of them are recent graduates who have just started working. Their language context is one in which they use between 2 to 3 languages, in the cities where they lived while participating in the experiments. Their language modes can also change depending on where they are, for example, they use Khasi, English and Hindi in Hyderabad and when they are in Shillong, they use Khasi, English and another Khasian variety.

I chose to study English as the other language mode for this thesis because it is the language in which my participants converse the most in their institutes and workplaces, in their respective cities, outside Shillong. This is also the language that they were schooled in and the language they use the most after Khasi. Every participant in the study went to English-medium schools and wrote their high-school and secondary-school exams in English. In addition, English is the medium of instruction in the institutes/universities where they study(ied). Of course this raises the question of what is meant by “English”, is the English tested here ‘Indian English’ and whether that English is somewhere on the English continuum or whether it is self-standing as a separate language. Apart from these questions, I begin with the assumption that these speakers know 2 languages well enough from childhood and that they were exposed to more than 2 languages. This comes from my own knowledge of the city that we grew up in. I also assumed that the sample population encountered more languages as they migrated and that there was a chance that they picked up even more languages on the way.

In a survey which included some of the sample population³, 31 respondents belonging to

³This population does not include all the participants in the experiment, but it gives an insight into the language context that the participants are in.

a student migrant group ⁴ answered questions about their language use. In response to the question “How many languages do you speak?”, their self report showed that they speak an average of 3.36 languages, and those languages change depending on where they are. In the cities where they currently reside (their current migrant city), they speak an average of 2.26 languages, with the highest number being 5 languages and the lowest being 1. The language that is common between all of them in their city of resident is English and 6 people responded speaking only English in their current resident cities. To that, 17 people added speaking Khasi as well. In addition, 17 participants report speaking Hindi or other South Asian languages. The language they all report as the common language is Khasi. This differences from the languages reported to be spoken in college or at work, which is English and Hindi and Khasi (in spaces where they have other Khasi friends in their classes). When they are in the places where they were born (Meghalaya), they report speaking an average of 2.4 languages, with the highest number of languages being 6 and the lowest being 1. In addition to Khasi, 23 participants report speaking English in Meghalaya, 12 participants report speaking other Khasi varieties, which could be more than one language. The other Khasian varieties reported are War, Mnar, Pnar, Maram, and the varieties spoken in Mawlai and Nongspung.⁵ (different regions in the Khasi hills). In addition, 6 participants report speaking Hindi in Meghalaya. In terms of Age, all participants reported hearing English and Khasi before they reached the age of 12, and 23 reported learning English after they turned 12. Since this is a self reported data, I assume that the report of age refers to how confident they feel about English, since they all attended schools where the medium of instruction, except for the languages classes are in English. In addition, when asked how many languages did you hear as a child, from your neighbors and through the television and radio, they report having heard an average of 3 languages in their childhoods. Most people report Khasi and English, with others reporting other Khasi varieties, Hindi and other South Asian languages as the languages they were exposed to as children. While this is in no way an exhaustive report, it shows the complex language contexts that these participants grow up in and live in as adults. For many, with the exception of English, which is taught in schools, the languages that they learn in a formal setting refer to “Foreign” languages, which include Latin, German, French, Swedish, Japanese, Korean and Russian.

⁴A few of the participants continued on working in major Indian cities after studying outside the state of Meghalaya, where Khasi is spoken.

⁵Whenever Khasi is used throughout the thesis, it refers to Standard Khasi and not to the Khasian family. Other varieties of the Khasian languages have been documented as varieties of the Khasian family, including some of the languages mentioned here. (Diffloth 2005; Sidwell 2009; Koshy and Wahlang, 2011).

1.4.2 Khasi

Khasi is an Austro-Asiatic languages spoken in the Khasi and Jaintia hills, in the state of Meghalaya, India. It is one of the few Austro-Asiatic languages spoken outside Southeast Asia. One of the purposes for studying Khasi is because it is a poorly studied language, like the other Austro-Asiatic languages spoke in the Indian subcontinent.

The 2011 Indian census lists Khasi as having 10,37,964 speakers, which refers to the standard Khasi variety of the Khasian languages under research in this thesis (Census of India, 2011).

The language is a Subject-Verb-Object language and it is polysynthetic and agglutinating through prefixes. It uses case markers, deictic markers, adverbs as part of its spatial expressions. Case and deixis are marked as prefixes, as will be presented in more details in the next chapter. To start with, I chose speakers of Khasi because it is a language with compound verbs, case markers and an adverb-rich language. Compound verbs are an important category to study in the field of motion event typology because they do not fit in neatly into the satellite vs verb-framed typology that dominates the field of motion event studies and hence for the study of NAM as well. There are over a hundred adverbs listed as descriptors of the verb *ja'd* “walk” alone, in Bars’s *The Khasi-English Dictionary* (Bars, 1973). While much of the literature on motion event descriptions are typologically classified according to Talmy’s motion typology, to explore the ways in which these parts of speech describe extension is in itself worthy of research. In terms of spatial grammar, Khasi marks Locative, Ablative and Allative cases, through affixation. Khasi uses a deictic system, marking both distance and elevation (Nagaraja, 1985; Diessel, 1999). This system follows the correlation made by Schultze and Berndt (Schultze-Berndt, 2006) between the terrain in which a language and spatial expressions . Khasi uses a combination of elements from all three frames of references (Wahlang and Koshy, 2018). In the relative frame of reference, it has *ka-dian-ka-mon* ‘left-right’ coordinate points. It also has absolute frames of references *mi?-ni* ‘come out-sun (East)’ and *sep-ni* ‘finish – sun (West)’. However, there are no words for ‘north’ or ‘south’, and the case + deictic markers for elevation are used to talk about latitudinal differences, *ha/fa-rum* “lower” and *ha/fa-nen* “higher”. (Wahlang and Koshy, 2018). This use of uphill and downhill is more primary that North South as will be exeplified below. The sentence would be used if someone were to ask a person where Guwahati lies, if the people talking were in Shillong.

9	<i>ka-guwahati</i>	<i>ka-don</i>	<i>fa-rum-nonpo?</i>
	3FSG-Guwahati	3FSG-exist	ALL-low-nongpoh
‘Guwahati is downhill of Nongpoh’			

Guwahati is an Indian city to the North of Shillong, the capital of Meghalaya, where Khasi is spoken. Nongpoh is a small town, half-way between Shillong and Guwahati (North of Shillong and South of Guwahati). For most Khasis, locating Guwahati in relation to Shillong, is by expressing its location in terms of elevation instead of using North-South geocentric FoRs. Hence, despite Nongpoh being South of Guwahati, it would still be above Guwahati. However the same up-hill/ downhill cardinal markers are also used for talking about North and South, so that Delhi would be *ja-rum-Kashmir* to mean North of Delhi (Wahlang and Koshy, 2018). The other interesting feature that makes Khasi a good candidate for the study of Non-actual motion is the rich system of word formation through compounding that the language has. Amongst the many other combinations, it allows VERB + VERB compounding. Koshy and Wahlang have given a few examples of these combinations, including the combinations of a deictic verb go with a manner verb walk in *le^jt-ja:^jd* “go-walk”.

1.4.3 Indian English

Indian English (IE) refers to the English spoken in the Indian subcontinent, to put it loosely. There are obvious problems with constructing a linguistically water-tight definition of what Indian-English is and looks like (see Rajagopalan, 1997; Sailaja, 2012) given the many varieties of language families in India and the kinds of Englishes that arise from the interaction between English and these varieties. Despite this vagueness and the issues surrounding IE, it is considered to be one of the Outer Englishes in a mapping of the English languages around the world (Kachru, 1985). While IE might not be well defined, there is an agreement that the syntactic structure is the one important commonality that doesn’t display too much variation in terms of the world’s Englishes (Sailaja, 2012).

Attempts at describing IE have been made, at all levels of linguistic analysis. In terms of motion events and spatial cognition, the use of the imperfective marker *-ing* in IE, proposed to be a result of a separate typology altogether through the interaction between Hindi and English, and not merely a substrate (Hindi) affecting the superstrate (English) (Sharma, 2009) is an interesting candidate for this thesis. At a grammatical conceptual level, does this indicate a continuation of extension? In addition, Indian English also has reduplicated forms that might potentially change the meaning of the base form. As we shall see in this thesis, verbs like *join* take on a concept of continuity when reduplicated. These aspects of Indian English may correlate to what Aneta Pavlenko talks about as stabilized convergence, which is a result of language contact (Pavlenko, 2016).

1.5 Going ahead

This thesis is interested in the experience and ways of describing and talking about extended spatial objects, in particular what are called co-extension paths. Co-extension paths are a type of objects that extend spatially, e.g., roads, pipes, fences, trails. Other types of extended objects are listed in Talmy's work on fictive motion (Talmy, 1996; 2000b; Stosic et.al., 2015). I will test existing theories about this experience through experiments - elicitation and eye-movement experiments.

Blomberg's thesis used experimentation to prove test the different motivations for Non-actual motion. I will repeat this experiment in Khasi - English multilingual speakers. The aim is to study the kind of settings that facilitate the use of motion verbs, in order to test the various underlying mechanisms that give rise to their usage. To do this, I will look at Khasi-English bilinguals' descriptions of static objects in their Khasi monolingual setting and their English monolingual setting. That is, participants will be instructed to only speak in Khasi in the Khasi experiment and only in English in the English experiment. Are these motivations modulated by the language setting that the participant is in or do the language modes make no difference to the responses given by participants. In addition, this thesis will also investigate the verb (and other parts of speech) repertoires of the participants and look for bi-directional interactions between the two languages in the sample populations.

Following the work of Matlock and Blomberg, I will study the eye-movements of participants to answer questions about the different motivations that lead to the production of FM expressions. This follows findings in empirical research on eye-movements and fictive motion by scholars like Teenie Matlock. Matlock (2004) reported that gaze durations were longer when the audio stimuli had fictive expressions than when they didn't, for the same visual presentation. She suggested that the reason for the results she found had to do with a dynamic mental simulation of motion, which resulted in the increased gaze durations. Gaze duration is the sum of all the fixations on a word/object in the first run of fixations before the eyes regress back to the same area/word. If the gaze durations are affected significantly by fictive motion expressions, Matlock concludes an effect of motion information rather than location, which means that we simulate motion while hearing Fictive motion expressions. This was confirmed by similar experiment conducted in other languages, including Hindi (Singh and Mishra 2010). In addition to these experiments, evidence of subjects simulation motion has also been found in fMRI studies (Wallentin M et. al., 2005a; Wallentin M et. al., 2005b).

However, if as Blomberg found, there are multiple underlying mechanisms for the use of fictive motion expressions, will our eye-movements tell anything about them? Using evidence

from Matlock's study and studies that show an effect of directions from verbal stimuli on eye movements, I will also attempt an exploration of eye movements study of NAM.

Chapter 2

Theories on Non-actual Motion

The study of spatial cognition and spatial grammars now occupy a separate and important place of their own in Cognition for several reasons. One, as Lackoff and Johnson point out (Lakoff and Johnson, 1999; Lakoff and Johnson, 2003), we use our bodies (and their configurations) in relation to other objects, to talk of many other aspects of life - love, time, inflation of prices and so on. This mapping of concepts from spatiality is distinct from the general importance and primacy of space and spatial reasoning that affects every other facet of human thinking from movement to geometry. Two, spatial cognition is an essential element in cognition because our interaction with the world and with other beings is largely still spatial. Like any other study of human behaviour, the field has searched for what components are shared by every other human and what components are affected by the environment that people are in, in this case, the cultural linguistic environment. This research led to the the breaking up of space and motion into two main objects - *Figure* and *Ground* (Talmy, 1985; Levinson, 1996). *Figure* is the object that is being talked about with reference to another object, the *Ground*. The relation between the two can be static or kinetic/translational (Levinson 2003, 2006; Talmy 1996, 2000). Stasis and kinesis/translocation form the binary conceptual subdivisions of our spatial reasoning - objects are spatially at rest or moving. However, our experience of the world is not always straightforward in terms of categories. For example, let's take the Cambridge.org's definition of a plate (<https://dictionary.cambridge.org/dictionary/english/plate>). It is defined as "flat, usually round dish with a slightly raised edge that you eat from or serve food from: paper/plastic/china plates". Does a plantain leaf from which people in many tropical regions around the world classify as a "plate"? We can think of more common examples of whether a tomato is a fruit or a vegetable, whether a bean bag is a chair and whether a penguin or an ostrich is a bird. Empirical data show that our classification of objects (real and abstract)

is not binary in the Aristotelean sense; rather it is graded, with some objects being closer to a prototype of a category and others further away from the prototype (see Rosch, 1999; Lakoff, 1999). The approach to Fictive or Non-actual motion in this thesis is similar to the approach of prototype classifications, guided by evidence that our categorisation of stasis and kinesis seems to be non-binary in this case. We do not experience objects only as ‘static’ and ‘kinetic’, as shown in the examples in Chapter 1. In between these two, there are objects that are static or at rest objectively, but that we sense motion in (Matlock, 2004, 2011; Blomberg, 2014). These objects are physically extended, either across the X-Y axes or into depth. Given that our experiences and descriptions of these objects seem to straddle this binary divide, it has become a subject of interest for scholars who study them both through Language and through theories and experiments of our perception of them.

2.1 The underlying mechanisms

A few questions arise from our use of fictive motion expressions. Why do we use motion expressions when we talk about extended static objects in the world? Are such expressions non-literal or metaphorical or do the meanings of words like *run*, *go* and *cross* have semantic extensions which are static? The history of the field started with the question of categorising motion expressions used for static objects. Jackendoff treats expressions like ‘he goes...’ and ‘the road goes...’ as belonging to the same category. He argues that the two are instances of the *go*-function, and this function is not based on translocative motion but rather on change (Jackendoff, 1983). Empirical studies differ from this stance (Matlock, 2004, 2011; Blomberg, 2014). The results from these studies suggest that the use of motion verbs in descriptions of static objects are motivated by an embodied cognition of space, which includes elements of dynamicity and direction - reflective of simulation or an experience of motion. The evolution of ideas on fictive/non-actual/abstract/subjective motion started with Talmy’s pioneering theoretical work, in which he proposes a discrepancy between two cognitive processes, namely the visual and the linguistic (Talmy, 1990, 2000a). He details an outline of the structure of his model which explains the use of motion expressions for static objects. This model has three cognitive sub-parts. The first two are representations of one entity (e.g object A) in an individual, with one cognitive representation being more veridical than the other. For example, if object A is a road, the visual representation would be that of a static object, while the linguistic representation would be of a moving object. The stationary, visual representation is more veridical and factive while the language representation is less veridical and fictive. Hence, there is a discrepancy between the representations of these two parts/sub-systems, in this particular

case the visual system and the language system. The third system is one which generates a cognitive assessment of object A. The sub-system assesses the two representations and the one which is seen as more veridical, is then taken to be the state of the object. The discrepancy between the representations of the first two systems does not necessarily lead to a conflict within an individual, rather they exist as alternate representations of the same entity. In the case of Fictive motion (as opposed to factive static visual representation), the language system's representation trumps because of the bias of *ception*. *Ception* is a concept which includes "all cognitive phenomena, including the conscious and the unconscious parts of it, or perception and conception – covering the processes of sensory stimulation, mental imagery and the experience of thought and affect in the process" (Talmy, 2000a:139). Due to our bodies' motion and the way we experience the world, we are in effect biased towards dynamicity, leading to the use of fictive motion expressions. In effect, what Talmy does is to place two competing cognitive sub-systems in competition with each other, and treats fictive motion as a superimposed 'simulated' representation, attributing it to the 'imaginal capacity of cognition" (Talmy, 2000a). The use of the word veridical and the term fictive motion itself has been problematised by several scholars (Brandt, 2013; Blomberg, 2014). For now, the term simply stands for a representation of the world which in a given situation is more successful. To give an example, in an optical illusion test, the image that is most prominently seen would be more veridical. In the context of fictive motion, this allows for the perception of motion, even when the visual representation does not say so. Because of the physicality of our bodies, which requires movement for us to experience the world, we have a predisposition towards motion. This predisposition to motion has been adapted and expanded on with details through eye-movement explanations and phenomenological understanding of subject-object interaction by scholars such as Langacker, Matlock and Blomberg (Langacker, 1990; Matlock, 2004; Blomberg, 2014).

In a similar vein to Talmy's body-centered explanation of Fictive motion, Langacker (1990) uses eye-movements (scanning) in visually processing objects in our field of vision as a motivation for the experience of motion and the use of motion verbs. He explains the role of directionality in the scanning process (in processing time, (t)). Every process of conceptualization involves a subject that focuses and an object that is being focused on. When the object of conceptualization is the way in which the subject itself is processing information, it undergoes *subjectification*. Hence in example 1) of the previous chapter, 'the highway running', it is the subject's way of looking at the object that is focused on and talked about. This process of subjectification is not to be confused with one where a possible mobile actor is imagined on the path. Rather, it is the act of scanning itself that simulates motion. His hypothesis is that subjective motion is the 'construal' of an object, conceptualized by the 'conceptualiser' through an act

of bringing the object that is being conceptualized into the attention of the conceptualizer. In fictive motion, it is the act of conceptualizing itself that is being brought to the forefront of the person's attention. This subjective conceptualization is inherently dynamic. So, when one talks of 'a mountain rising' it is the act of attention of the speaker that rises, which Langacker calls 'subjective motion'. While this process could account for the use of dynamic terms to describe static objects, it is different from the process given by Talmy. Subjective motion is physically caused by the way we move our eyes on objects, or what Langacker calls visual scanning.

Matlock (2004, 2011) through behavioural and eye-tracking experiments, confirmed that the gaze duration of the sample population she studied was increased when they followed objects on the screen which were accompanied by audio descriptions of fictive motion expressions. She argues that use of motion verbs to describe static objects is motivated by a simulation of motion of these objects (Matlock, 2004), wherein the behavioural increase in gaze duration was attributed to 'simulated motion'. As Blomberg pointed out, the word simulation is problematic because of the relegation of motion experience in this case to 'artificial' or 'not as real' as the visual experience of stasis. (Blomberg, 2014; Brandt, 2013). In both Talmy's and Matlock's ideas, outlined so far, there is a focus on the imaginative capacity and that results in NAM expressions, even as it accepts the experiential reality of this phenomenon.

And the term 'fictive' has been adopted for its reference to the *imaginal capacity* of cognition, not to suggest (as perhaps the word 'fictitious' would) that a representation is somehow objectively unreal. (Talmy, 2002: 100, my emphasis)

Blomberg (2014) denies the binary divide between fictive and veridical representations of objects and instead treats these two competing sub-systems as two 'modes of givenness'. 'Givenness' here is used in the phenomenological sense of the way that the world reveals itself to us. While both are experiences of the world, the one where we experience motion of a static object is just as real as the one in which we do not. In particular he says that the feature of affordability of human motion on an object affects our experience of the world when we approach it as an object that is being uncovered or revealed.

A phenomenological consequence of kinesthetic effectuation is that perception itself is dynamic, not only in the sense of a process unfolding together with motility, but also that *perceptual objects give themselves in the dynamic flow of space*. There is always a dynamic and kinesthetic relation to the environment through which we perceive a road or a path as features of the environment that afford movement (through a forest, or to a summit). (Blomberg, 2014:160 my emphasis)

Blomberg approaches Langacker's 'visual scanning' and Talmy's 'bias to ception' through a phenomenological tradition, in which the experience of motion is not only a psychological experience caused by our biological structure (eye movements and bodily movement), rather it is also guided by the structure of the objects themselves and the way they reveal themselves in a perceptual plane. In other words, the experience of Non actual motion is not only attributable to our physical and biological motility but perceptual objects as well, which play a role in guiding our experience of it. This is an experience of *lived motion* - where the potential for motion in the observer, because of the relationship we have with objects around us, enables Non-actual motion (see Blomberg, 2014). In the same vein, Language is also not a psychological object, but it is guided by the linguistic order and context that exists in the environment. By not reducing the experience and the expression of Non actual motion only to a psychological phenomena, he turns away from a purely psychological model of Fictive motion and includes a more nuanced understanding of our spatial experience, in which experience of NAM is a result of a relationship between the perceptual object and the perceiver. This paper adopts his model and material design both because it includes in it the multifaceted nature of Non-actual motion (NAM) and also because it agrees with the philosophical approach to the subject.

Blomberg calls the potential of motion on objects that afford motion *enactive motion*. The importance and primacy of *enactive motion*, or the experience of the world constantly unfurling itself to us, as a motivation for Non actual motion was confirmed through experimental studies in Thai, Swedish and French (Blomberg, 2014) and in several other corpus and experimental studies (Stosic et al., 2016; Ma, 2016). This however operates only with such objects that are extended into the world from a first person perspective (Blomberg, 2014). When we experience objects stretching across our visual field or what he calls a third person perspective, the act of visual scanning is proposed as the motivation for the use of NAM expressions. Stosic et al. (2016) confirmed Blomberg's work while adding that there has to be further investigations into the motivations for NAM.

To test this hypothesis, Blomberg designed an experiment which he carried out on speakers of French, Thai and Swedish. The design was such that it looked at the two modes of givenness, the enactive and the scanning. To do this, the experiment had images that displayed objects from a first person perspective and from a third person perspective. These objects were divided into ones that allow human motion on them and ones that do not. For example, some of the objects presented were pipes and fences and others, lanes and bridges. In addition, some of these objects crossed boundaries, into tunnels and others ended or started with a landmark, while others had no landmarks. The hypothesis was that objects that afford human motion and which were presented in a first person perspective would motivate an enactive experience of the

objects. This would lead to more Non-actual motion expressions as compared to objects that do not afford for human motion, when presented from the same perspective. The third person perspective on the other hand should not be as affected by the availability of motion because the act of visual scanning on the objects would motivate the use of Non-actual motion expressions. This of course would hold true unless the use of NAM is limited by a language under investigation (Matsumoto, 1999). In addition to these, NAM expressions could also be metaphorically motivated. His findings were consistent with his hypothesis. However, amongst the images he tested, he also found that images with pipes entering tunnels tended to elicit a very high number of NAM expressions, and he credited these numbers to the change in from one side of the boundary to the other. his hypothesis stems from Slobin's theory of boundary change as being a motivator for the use of entry/exit verbs. He argued that the presentations of objects which enter into a tunnel comes with a knowledge that these objects continue on, on the other side of the boundary (Blomberg, 2014: 220) unlike objects that terminate within the presentation. The same experiment was repeated in French, Italian, German and Serbian (Stosic et al., 2015). Their experimental results showed that the affordance of motion had a significant effect on all the four tested languages (French, Italian, German and Serbian). Their corpus analysis of English, German, French, Italian, Serbian and English showed that there were significant differences between the language families in the number of NAM expressions (see Stosic et al., 2015). However, they also found significant quantitative differences in NAM expressions for the different categories of fictive motion given by Talmy (Talmy, 2000a), with co-extension paths, radiation paths and advent paths having the highest number of NAM expressions. Their corpus study begs for further exploration into the multifaceted nature of NAM.

2.2 Depth perception and distance

One of the topics that Blomberg briefly brings up is our knowledge of objects, for example, that we know that pipes would continue on into a tunnel if we were standing on the outside. This is an important facet of our world knowledge that I will explore further. How, for example, do we know that an object extends away from us? One of the possible explanations is the experience and perception of depth. Langacker's theory for instance treats objects as if we look at them from a third person viewpoint, and the tests on visual scanning is treated as an act done on a rather flat X-Y plane. While that could be true, our eyes also move and track objects moving away from us. When we look at objects moving away from us, say a car, we experience this movement as something that grows smaller in size. Similarly, we know that certain objects can stretch over space and the further they extend away from us, the smaller

they become in size. These objects can include categories like mountain ranges, forests as a whole, deserts, beaches, boundaried land, which make up a certain category of objects, let's say landscape objects. Another category is roads, lanes, tunnels, pathways, trails and bridges, objects that are made for us to move on. Another category would include pipes, wires, cables and so on. Of course these categories are not set in stone, we can for instance talk of a beam that goes from floor to ceiling and a branch that goes across the wall. However, in all these, there is an experience of objects moving away from us, either up/down, left/right or away from us. When objects move away from us, we experience distance. How does this happen? In the case of objects that extend into our visual field, the property of extension is perceived through a convergence of parallel lines or through a decrease in size, in the same way that an actual moving object becomes smaller as it goes away into the horizon. This is very connected to our experience of depth.

Depth, like breadth and width, is a dimension which is experienced by us in the process of placing objects around us in a coherent manner. The difference lies in that depth, unlike breadth and width, is a perception which contains in it the most explicit engagement of the subject with its spatial orientation (Berkeley, 1709, Merleau Ponty, 1962). Thinking about depth, Merleau Ponty's analysis is useful;

More directly than the other dimensions of space, depth forces us to reject the preconceived notion of the world and rediscover the primordial experience from which it springs: it is, so to speak, the most 'existential' of all dimensions, because (and here Berkeley's argument is right) it is not impressed upon the object itself, it quite clearly belongs to the perspective and not to things. Therefore it cannot either be extracted from, or even put into that perspective by consciousness. It announces a certain indissoluble link between things and myself by which I am placed in front of them, whereas breadth can, at first sight, pass for a relationship between things themselves, in which the perceiving subject is not implied. They differ in how this experience unfolds itself. (Merleau Ponty, 1962: 298)

While Berkeley looks at depth as an invisible breadth, one that can be reconstructed by stepping aside from the immediate view and reconstructing it through the dimensions of breadth and width (Berkeley 1709), Merleau Ponty explains it through a phenomenological and embodied approach, i.e. as something that is constructed by our gaze and guided through the perceptual object. He gives an example of a cube where we perceive depth in the two-dimensional drawing of lines connected to each other to form a geometrical structure. While this example is one of a static object on a two dimensional surface, it is useful for the understanding of depth and how

it comes to be through our gaze. Let's take a look at a cube in Fig.1.1

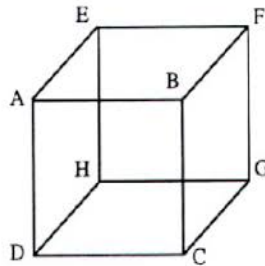


Figure 2.1: Cube (Image source: Stanford Encyclopedia of philosophy)

When we look at Fig.2.1, we perceive depth in the object, which gives it a three dimensional sense. Regardless of whether we perceive ABCD or EHFG to be the face at the front, we perceive one of the faces of the cube as being in the back, and the faces AEDH and BCFG to be the sides. These side faces extend into the page or out of the page, giving the whole image depth. Still, we are all aware of this image being a projection of a three dimensional structure onto a two dimensional surface and we know that there is no 'real' depth to this figure. So how do we then perceive depth? According to Merleau Ponty, this perception arises from the way in which the lines of the cube are ordered, guiding our gaze to converge, leading to the construction of depth (Merleau Ponty, 1962).

The act which corrects the appearances, giving to the acute or obtuse angles the value of right angles, to the distorted sides the value of a square, is not the idea of the geometrical relations of equality, and the geometrical mode of being to which they belong—it is the investing of the object by my gaze which penetrates and animates it, and shows up immediately the lateral faces as 'squares seen askew', to the extent that we do not even see them in their diamond-shaped, perspective aspect. This being simultaneously present in experiences which are nevertheless mutually exclusive, this implication of one in the other, this contraction into one perceptual act of a whole possible process, constitute the originality of depth. It is the dimension in which things or elements of things envelop each other, whereas breadth and height are the dimensions in which they are juxtaposed. (Merleau Ponty 1962:308)

The perception of depth even when we're not projecting things onto a two dimensional surface is given by the gaze of our eyes and the way in which these objects are positioned in the world.

It is important to note that Merleau Ponty does not subscribe to a purely psychological construction of the world or a purely empirical one either. In that sense, as Blomberg (2014) points out, Langacker's *subjective motion* dismisses the role of the perceived world, and treats it the experience of non-actual motion as a structuring of an unstructured objective world through the process of subjectification. Our eyes converging to perceive depth in our everyday visual interaction with the world, is not a result of the convergence of the pupils and other eye movements alone. Rather it is the disambiguation of a perceived world which has an existing order, but which allows for a completion of order to a non-singular end. I propose that enactive perception of the world also includes depth perception and could be one of the underlying reasons for an experience of NAM. In a similar way that a moving object changes size as it moves away into the distance, an extended object changes size as it continues away from me. This distance is perceptually constructed by my gaze on the object, whose diminishing size gives me a sense of motion. Similarly, an extended object which gradually becomes smaller is then an object whose physicality is constantly diminished from the hold of my gaze and is therefore moving away from me. My experience of a car moving away from my view in position A brings with it an experience of depth, and similarly, the experience of an object whose very body extends away from me necessarily brings with it a perception of depth. We can compare this to Langacker's visual scanning. Langacker's model accounts for two spatial axes, horizontal and vertical and his hypothesis efficiently explains FM/NAM for the two. This thesis proposes a similar explanation for the third axis, depth. An object in motion is understood by me as changing positions from A, B, C in time t_1, t_2, t_3 ... An object that occupies multiple spatial positions A, B, C..... does so in distances d_1, d_2, d_3 ... From these distances, one probably extrapolates time t_1, t_2, t_3 ... that the observer calculates for the object to traverse these multiple locations. This possibly brings a temporal aspect to a static object, and this temporality, similar to Langacker's visual scanning brings with it a sense of motion of a static object. In this sense, we can say that the multiple locations of an object, like the change of location of a moving object, gives us the experience of motion. This temporal aspect, I propose to be intimately linked to our experience of NAM, through the perception of depth. Our knowledge of extended objects from our experiences of them, even when we do not see them in their entirety tells us that they likely extend away from us. The physical dimensions, like the ratio of extension of an object to other objects surrounding it (or other physical particulars) that allows for an experience of motion is not yet researched and is beyond the scope of this study. However, in the thesis, we will explore the question of depth as a possible motivation for NAM through an elicitation experiment and an eye-tracking experiment.

2.3 Spatial grammar and NAM

The theories that arise through a philosophical introspection about NAM have met data based studies, sometimes concurring with the them, sometimes at odds with each other. Like any other study, these have fed into each other at times, and the differences have not always been resolved.

In the search for universals, both theorists and linguistic typological studies have come up with two objects that are shared by every language in their expressions of spatiality - *Figure* and *Ground* (Talmy, 1985; Levinson, 1996). *Figure* is the object that is being talked about with reference to another object, the *Ground*. The relation between the two can be static or kinetic/translational (Levinson, 2003, 2006; Talmy, 1996, 2000). Stasis and kinesis/translocation form the binary conceptual subdivisions of our spatial reasoning - objects are spatially at rest or moving. In the static sub-domain, if the objects are contiguous a non-angular and topological relationship is described using words like ‘at, on’ or other locational markers. When the figure and the ground are separated from each other, we need to describe the way the figure is angularly located to the ground. Once a figure and a ground is established, and they are not contiguous, what we have then is an angular relationship that is described through frames of references (FoRs) (Levinson, 2003; Levinson and Wilkins, 2006). Frames of references refer to the ways in which we locate objects around us. Different languages use different objects to locate surrounding objects - 1) Relative spatial reference system, where objects are located via the speaker as a reference point, 2) Intrinsic spatial reference system, where the objects’ intrinsic features are used as references and 3) Absolute spatial reference system, where objects are located using absolute markers, or environmental markers (north of). While this study does not investigate frames of references, it is nevertheless important to keep these distinctions as a background to the discussions that will follow.

In the literature on motion events, four core elements – motion and path (represented by the verb), figure and ground (represented by the participants) have been identified (Talmy, 1975, 2000b). Languages have also been classified on the basis of the information that the root verb conveys (Talmy 1985; 1996). If the verb carries information on both the motion and the path, the language is classified as a verb-framed language (Talmy, 1975; 1983). Romance languages for example, have been typically categorized as verb-framed languages. If the verb carries information only on motion and manner, and the path is encoded by satellites (adverbs, prepositions, case markers, etc.), then they are classified as satellite-framed languages. Germanic languages are a typical example of satellite-framed languages. This neat distinction, however, does not always work, as has been reported in the case of constructions involving serial verbs in

Thai (Blomberg, 2014). Similarly lesser reported languages like Arrente (Wilkins, 2006) were reported to encode manner of various kinds in co-verbs. On the other hand, in Yucatec Maya (Bohenmeyer and Stolz, 2006) and in Jaminjung (Schultze-Berndt, 2006) change of location information does not necessarily include information of motion. These variations in the way languages encode information about spatial and motion relations and events have led to treating deixis as a separate element in this field (Zlatev and Yangklang, 2004; Blomberg, 2014). The linguistic typological studies of motion event studies are relevant for the study of NAM since the ways of expressing properties of extension are done through motion descriptions. Linguistic typological studies of NAM have opened up a whole new area of research into the kinds of motion that are allowed to be expressed in different languages in NAM. Matsumoto (1996), for example, highlights the critical role of the +/- (presence/absence) affordability of human motion as a feature that determines the kind of motion verbs that are used in Japanese. Matsumoto's comparative study of English and Japanese, led him to propose two important parameters with respect to the encoding of information on path and manner in fictive motion expressions (referred to later as Matsumoto's Conditions):

- a. **The Path Condition:** All fictive motion expressions must express some property of the path of motion.
- b. **The Manner Condition:** No property of the manner of motion can be expressed unless it is used to represent some correlated property of the path.

(Matsumoto, 1996: 12)

While there are no studies that have found evidences to contradict the Path Condition, there are questions raised about the Manner Condition, not so much in contradiction to the condition itself, but in the available data now that shows that different languages allow for different expressions on the manner of motion and may not necessarily be used only to represent the path itself (Rojo and Venlenzuela, 2003; Blomberg, 2014). Typologically, through evidence in a study of Swedish, French and Thai, Blomberg has categorised languages as either having Non-actual movement (with information on velocity, for example), which would necessarily have Non-actual motion and non-actual path (without verbs); and languages that have non-actual path and non-actual motion. The distinctions between the three will be explained a little more in-depth in the following chapters. A schema of the typology looks like this:

Non-actual path > Non-actual motion > non-actual movement.

Several languages have now been studied: a corpus study on French and Serbian (Stosic et al., 2009), Tarema's corpus study on Estonian (2013), a study on Spanish and English (Rojo et al., 2003), Blomberg's study on Swedish, Thai and French (2014), a study of Bodo (Som,

2013) and the latest study on French, Italian, German, English, Polish and Serbian (Stosic et al., 2015). These studies looked at NAM expressions through the lenses of Talmy's Path and Satellite languages, in addition to the ways in which languages limit the kinds of objects that are described using NAM expressions.

2.3.1 Semantic analysis framework

The methodology adopted for a systematic analysis of grammar can be done in several ways, including a descriptive morpho-syntactic analysis of word classes used in a language. This however might be complicated as words could entail different meanings depending on the context they are used. One of the methodologies used solve this issue is to use a set of semantic categories and compare how languages spread their resources to encode these semantic categories. For the analysis of the data in this thesis, the Holistic Spatial Semantics Framework, was chosen, because of its coherency and because of the design of the stimuli is closely connected to the framework.

Holistic Spatial Semantics: The Holistic spatial semantics (HSS) framework was designed to analyse the linguistic resources used by the participants. HSS, is the basis on which the stimuli for the experiment were designed and the theoretical grounding for it is based on an understanding of semantics of spatial grammar as both the semantics of the words used in but also the knowledge of the context in which they are used. Talmy's verb-framed and satellite-framed languages conflated spatial categories like path and region and HSS is designed by easing out the differences to account for the following set of spatial categories (see Blomberg, 2014; Zlatev, 1997):

1. Figure and Landmark - Figure is the object that is in motion or whose location is the locus of a description and Landmark is the entity against which the figure is described.
2. Frame of Reference (FoRs): frames of references, where the figure is located relative to the following:
 - (a) Object-centered: relative to the Landmark
 - (b) Viewpoint-centered: relative to perspective of "a real or imaginary viewpoint"
 - (c) Geocentric: relative to "absolute geo-cardinal bearings"
3. Region: This semantic category refers to the details of the relationship between the figure and landmark. This accounts for the specifics of the relationship. This is an important feature because it allows for a more detailed analysis of aspects like different ways in

which an object is located in relation to the Landmark, for example, *on* vs *in* relationships. It is useful in that it also takes into consideration linguistic typological differences of case marking vs prepositions as well as the more stark differences like *close-fit* vs *tight-fit* in Korean (Choi and Bowerman, 1991) and *hanging-protruding* objects relations vs *contact* relations in Dutch (Bowerman 1989, 1996).

4. Motion: Motion which is either translocation or not translocational.
5. Path: Path here refers to the trajectory of the figure in relation to the Landmark(s). This thesis also adopts the rich reading of Path (Blomberg, 2014), which includes *from-to* descriptions as Path, and does not only look at path as a part of motion.
6. Direction: This category is used for situations where motion is described without Path (Zlatev, 2003; Blomberg, 2014).

2.4 Do language restrictions affect cognition?

These theories about the multifaceted motivation of NAM all point in the direction of extended objects having a potential for motion because of the ways in which the perceptual experience of them unfolds. These theories should hold true for every human. Languages, however, for reasons of economy and other factors like landscape, differ in 1) what is allowed to be described in NAM expressions, and 2) the kind of motion information that is allowed differs from language to language. Does this mean that the perception of NAM also differs depending on the languages one speaks? Drawing from experimental studies on the interaction between language typologies in actual motion events and cognition through eye movement studies, we find that differences seem to show up only when the task at hand is linguistic (Gennari et.al., 2002; Papafragou, 2006).

In the next chapter we will look at Khasi speakers through 1) experimental data on the kind of perception that elicits the most number of NAM expressions and 2) the kinds of expressions that Khasi speakers use describing spatially extended objects.

2.5 Summing up

This chapter has looked at the various theories available to explain the use of NAM expressions. Theoretically, Fictive motion and Abstract motion lack in their subjective and purely psychological approach to the phenomenon. The framework of Non-actual motion however,

gives a more wholesome approach to the experience, by accounting for the role of the object as part of the perceptual process, through phenomenology. I have also proposed the importance of extension and depth perception as a contributing factor in the multi-faceted nature of NAM.

This chapter also looks at the typological differences in languages and ask the question of whether these typological differences affect the experience of such extended objects.

In the following two chapters, I will repeat Blomberg's experiment to test if his hypothesis holds true for Khasi speakers and also look into the expressions given by Khasi speakers and compare them with the findings of other scholars in the field.

Chapter 3

Investigating NAM motivated descriptions in Khasi

(A part of this chapter has been published in the Journal of South East Asian Linguistic Society)

This chapter explores the various cognitive motivations for the use of NAM expressions in Khasi. As described in the previous chapter, the theories on the use of motion verbs to describe static objects postulate the experience of potential motion. Blomberg's most recent theory proposes *enactive* motion as a primary cognitive motivation for NAM. He proposes *visual scanning* and *metaphorical* to be the other motivators of NAM (Blomberg, 2014).

The kind of expressions under investigation in this thesis are exemplified below in 1a) to 3c):

1. a. The fence goes/zigzags/descends from the plateau to the valley.

[cf. I went/zigzagged/descended from the plateau to the valley.]

2. b. The field spreads out in all directions from the granary.

[cf. The oil spread out in all directions from where it spilled.]

3. c. The soil reddens toward the east.

[cf. (i) The soil gradually reddened at this spot due to oxidation.

(ii) The weather front advanced toward the east.]

(Talmy, 2000a: 138)

These descriptions include what are prototypically motion verbs or verbs of change - 'goes', 'zigzags', 'descends', 'spreads' and 'reddens.' However, these are used for static objects: 'the

fence’, ‘the field’ and ‘the soil’ respectively. The first example is a type of fictive motion expression that this chapter is investigating, which is called a ‘co-extension path’. Studies approaching the fictive motion question through a linguistic typological lens have been smaller in number (including Talmy, 1996; Matsumoto, 1996; Rojo and Velenzuela, 2003; Taremaa, 2013; Blomberg, 2014; Stosic et al., 2015; and Ma, 2016, among others) and have mostly made use of typological classifications devised to categorize actual motion events. Through a comparative study of English and Japanese, Matsumoto (1996) proposes some very significant correlations on the use of motion verbs to describe static objects:

The Path Condition: All fictive expressions must express some property of the path of motion.

The Manner Condition: No property of the manner of motion can be expressed unless it is used to represent some correlated property of the path. (Matsumoto, 1996: 12)

Matsumoto’s study is also important for highlighting another major constraint on what can be described using non-actual motion (henceforth NAM) expressions (especially with special reference to Japanese). It is found that extended objects, such as roads, which allow actual human motion, also facilitate the use of NAM expressions. The latest typological and theoretical contribution to the field is Blomberg’s hypothesis that “enactive perception” is a prime motivator for non-actual motion. This typological proposal is based on the level of dynamicity that a language allows to be encoded in a NAM expression (Blomberg, 2014). For example, Blomberg’s work on Thai shows that information on manner is retained when manner verbs are used by speakers to express the velocity of movement along the objects being described (Blomberg, 2014). According to Blomberg, languages may potentially express non-actual movement, non-actual motion and non-actual path. Non-actual movement includes information about velocity, and as this paper proposes, also information about body configurations while moving. Non-actual motion refers to the use of motion verbs to describe static objects. Non-actual path refers to the use of dynamic expressions through the use of prepositions, case markers, and the like but without the use of motion verbs. Thus, a hierarchy is proposed: non-actual path < non-actual motion < non-actual movement (Blomberg, 2014). That is, a language with non-actual movement may also have non-actual motion and non-actual path, while the reverse may not hold true. Theoretically, Blomberg’s approach differs from that of Talmy, Langacker or Matlock. He takes a phenomenological stance, which includes the role of the perceptual object in producing NAM (Blomberg, 2014). The model he builds includes three motivators for NAM, with the primary one being ‘enactive motion’ (Blomberg, 2014; Stosic et al., 2015). Enactive motion

is a mode of seeing and experiencing extended objects. This is described as the first-person perspective for the purpose of experiments in Blomberg's design (Blomberg, 2014). The second motivation is 'visual scanning'. This is referred to experimentally as the third person perspective (Blomberg, 2014). The third motivation for the use of NAM is 'metaphors' (Blomberg, 2014). Typological studies on NAM, which use actual motion typology to describe how languages encode extension, identify four core elements - motion and path (represented by the verb), and figure and ground (represented by the participants in a visual scene) (Talmy, 1975; 2000b). It is proposed that languages may be classified as verb-framed or satellite-framed on the basis of how they structurally encode a motion event (Talmy, 1985; 1996). A third-category of equipollently framed languages has also been proposed (Slobin, 2004; 2006). Examples 4 to 6 from English (4), Spanish (5) and Mandarin Chinese (6) illustrate this typology.

4. an owl flew out
5. sale un buho exits an owl
6. fei1 chu1 lai2 yi1 zhi1 mao1tou2ying
fly exit come one CL¹ owl
(Slobin, 2006: 4)

This chapter explores the ways in which Khasi speakers describe extension, both in terms of Talmy's and Slobin's typologies. In addition, it explores the kind of manner information that Khasi allows, and attempt to locate it in Blomberg's typology of Non-actual motion. This chapter includes two sections: (a) the different motivations behind the use of NAM, and, (b) the various descriptions of images given by the participants.

3.0.1 Linguistic resource questions

With specific reference to Khasi, this study addresses the following questions:

- How do Khasi speakers describe spatial extension, and what kind(s) of verbs do they use to express extension?
- When used in NAM expressions, do such verbs retain their manner information? What do they convey, in so far as extension is concerned?
- Are compound verbs used in NAM expressions, and do their semantics undergo any change?

¹Slobin originally glossed zhi1 as 'only' (which is zhi3), whereas it is a classifier for animals zhi1.

- How do other linguistic elements contribute to NAM expressions?

For this purpose, this chapter looks into how co-events (Talmy, 2000b) such as the manner of motion gets represented in Khasi. In the following sections, I try to address the questions posed above.

3.0.2 Behavioural Hypothesis:

1. The depth-extended images with objects that afford human motion are expected to elicit the most number of NAM expressions.
2. For the objects extending across however, the affordability of motion should not have a significant effect given that visual scanning should facilitate the production of NAM expressions throughout, unless there are linguistic conventions that stop this from happening.
3. Since the affordability of motion is expected to have a significant effect on the number of NAM expressions, and images with objects that do not afford human motion are expected to elicit lesser number of NAM expressions, regardless of the presentation of the object.

3.1 Experiment 1: NAM elicitation in Khasi

The model and stimuli material is taken from the NAM model in Blomberg (2014). For this thesis, the terms 1st person and 3rd person were changed, used by Blomberg to depth-extension and across-extension because the terms 1st person and 3rd person are potentially misleading. While the first person terminology carries with it the concept of lived motion, in which motion is potentially experienced by the perceiver, for the purpose of the thesis, the terminology has been changed for clarity alone. The experiment uses images, and it could be argued that all images are actually from a 3rd person perspective, in that they do not represent an experience of the objects in the picture themselves, but a rendering of these objects by an artist. In that sense, any viewing of a picture is a third-person experience of the objects in the picture, making these terms slightly confusing.

The experiment involved four different types of image sets. These images are included in page 154 as an appendix to the published paper, incorporated in the thesis. These image sets represent four conditions testing the role of enactive motion in NAM.

Four conditions were tested. Each condition had 6 images.

- Depth extended+ afford human motion (DE+Aff)

- Across extended+afford human motion (AE+Aff)
- Depth Extended - afford human motion (DE-Aff)
- Across extended-afford human motion (AE-Aff)

To test whether the view point of the participant had any effect on the descriptions, landmarks and figures were placed on the left/right of the figure (road etc) in images presented across and images presented with an extension of depth, at the beginning/end.

The images were taken from Blomberg's study of NAM expressions in Swedish, French and Thai. (Blomberg, 2014).

3.1.1 Methodology

All participants consented and agreed to participate in the experiment willingly. They were not compensated with money or grades, due to lack of funds and resources. However they were willing to do the experiment and remain in contact with me.² The images were displayed on a 16 inch laptop screen. 38 images were presented, 2 of which are practice images, 12 controls, 6 images for every test condition. The image display duration was self-timed. They were followed by a blank screen, during which participants were instructed to give an audio description of the images that were displayed. They were instructed to try and describe the images in a sentence, in order to avoid situations where participants simply named objects present in the image (following Blomberg, 2014). The experiment was deployed on Psychopy (Pierce, 2007). They were made to sit in a quiet room by themselves to run through the whole experiment. This was to ensure that none of them felt an immediate pressure of having someone listen to them. I believe my participants were comfortable with the experiment, and they reported as much, although they did report that they found some of the images odd.

Bilingual participants were instructed to speak only in one language (monolingual mode). They were also asked to try and give the descriptions in a sentence. One of the firsts participants made a remark while I was instructing her, she said "Oh phi kwah ba ngan thaw sentens?", which translate to "Oh you want me to create a sentence?". I found that the use of the word "create" in the instructions made it much easier for my participants to understand what I wanted from them and added this as an instruction with the rest of the participants in their Khasi modes.

²The participants have often curiously asked me about what I found from the data I collected. Despite my being unable to monetarily compensate for their time and effort, they were very supportive towards a fellow Khasi student in the city. After the experiments, I stayed with them at their residences, learning about their lives in the big cities. Many of them face a lot of problems with cultural differences and shared stories with me that go beyond this study.

It is important to mention here that all the participants throughout the experiments were aware that the person running this experiment is fluent in English and Khasi.

3.1.2 Participants

30 people, with an average age of 25 participated in the experiment. All of them spoke Khasi at home and have been educated in English medium schools.

Avg.age	Avg.age	Gender		Khasi	English	Education
25	25	17 male	13female	Fluent	Fluent	College/University

Table 3.1: Khasi Participant details

3.1.3 Analysis

A total of 1140 descriptions were recorded. Each recording was transcribed into text. An initial bin count was done to check for NAM expressions in the description. There was a step-wise analysis of the data. The first was a bin check of whether or not a NAM expression was used. Descriptions with NAM expressions were marked 1, and expressions without NAM expressions were marked 0. Out of a total of 720 descriptions of test images, there were 315 NAM expressions, which is 44% of the total count. This tallies with the findings of Stosic et al., (2015: 223) in which, ‘The corpus study showed a very low frequency of NAM expressions across languages’. Descriptions of the type ‘the bridge continued from x to y’ or ‘I can see a bridge from x to y’, are also included. These are expressions which give a sense of dynamicity even without the use of motion verbs. These expressions are categorised as Non-actual path expressions (Blomberg, 2014). This count however omits descriptions of posture and placement, and is counted as a separate category, going by the path category as listed by Talmy (2000). This count also excludes expressions of the type ‘A road to go to the house’. These sentences will be further analysed elsewhere³

³such descriptions are treated as ‘If-then statements’, where the Path is seen as a instrument of movement rather than having motion in itself.

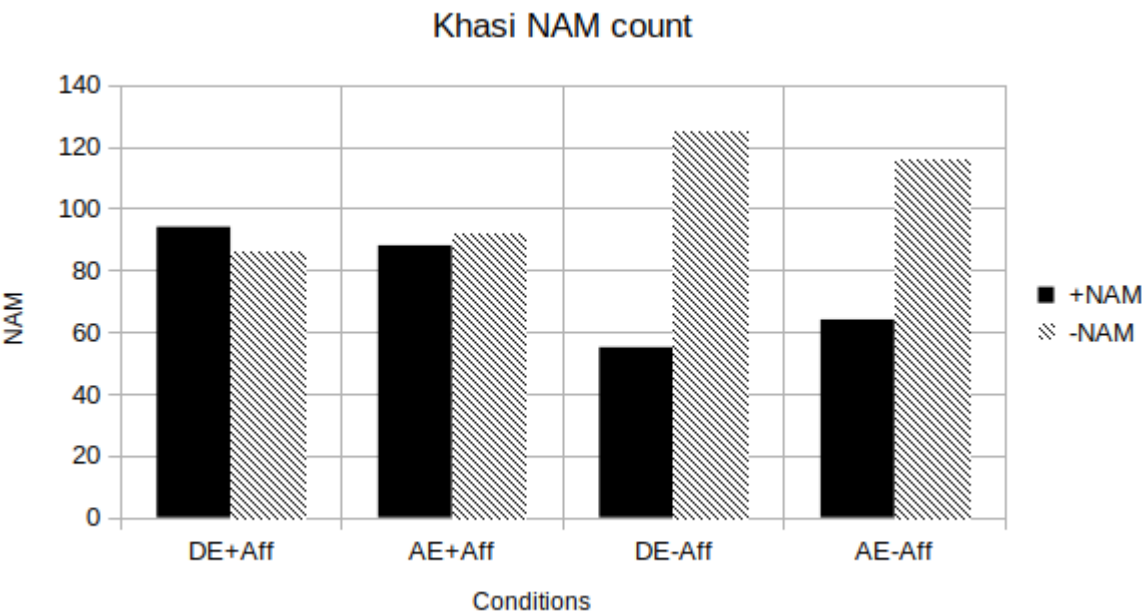


Figure 3.1: Khasi NAM count across conditions

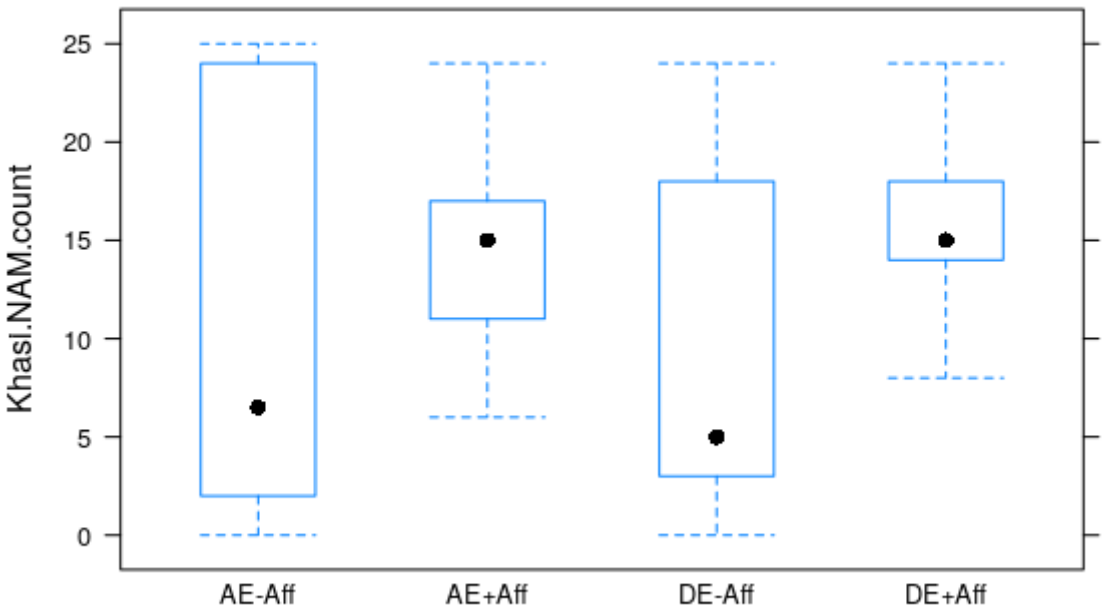


Figure 3.2: Khasi NAM across conditions

Within the 44% which did have NAM expressions, an analysis was done to look at whether or not the effects of perspective and affordability of human motion had any significant effect on NAM elicitation.

There were 0.8% of NAM expressions in Controls. The differences between the test conditions and control is highly significant, with $p < .01$.

The package lme4 (Bates, Maechler & Bolker, 2012) in R (R Core Team, 2012) was used to perform a generalised linear mixed effects analysis (glmer) of the relationship between the Conditions and the count of NAM expressions, in Khasi. The independent variables Extension and Affordability as fixed effects, in the model. As random effects, Participants were accounted for. The differences between each stimuli was not taken into account because there was not enough exposure to the same stimuli, and would it require a bigger sample size to take their effects as random variables into account.

Affordability had a significant effect on the use of NAM, $p = 0.009$, while extension had no significant effect on the use of NAM. The interaction between affordability and extension also showed so significant results. The following image shows the odds ratio of NAM being used to be significantly higher when there is an object that has the feature of Affordability of motion. The same is not true of extension and of the interaction between extension and affordability.

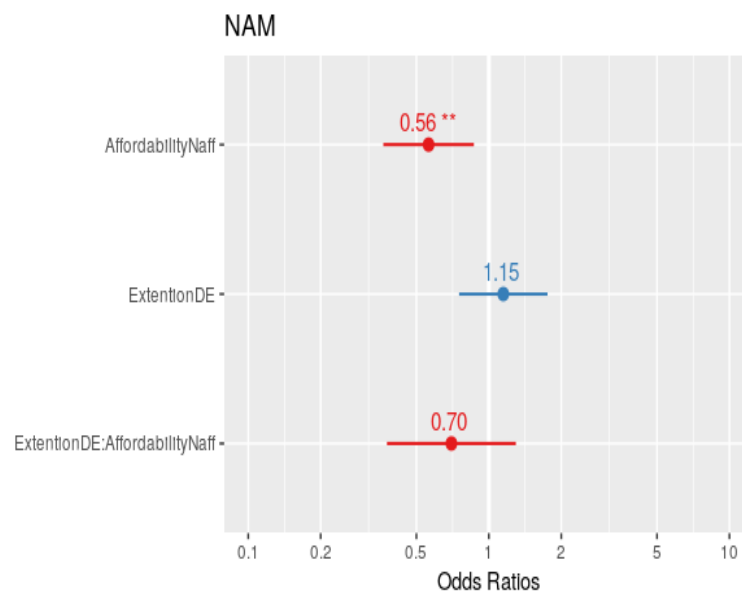


Figure 3.3: Significance levels of affordability, extension and their interaction in Khasi

The post-hoc analysis of the test of the interaction between affordability and extension returned a power of ‘9.50%’ (Likelihood ratio test, using powerSim from package simr on R).

This power is not adequate to fail to reject the null hypothesis. The effect size (Cohen's D) between the effect size between the conditions DE+Aff and AE+Aff was very small (0.067). One of the factors could be due to small sample size. The recommended sample size for an 90% power with 0.067 Cohen's D is more than 526 participants. This number of participants is difficult to obtain and the small sample size could be a reason for the insignificant result.

3.1.4 Discussion

The results point to 'Affordability of motion' as a feature that plays a significant role on whether or not NAM is used. However, neither extension by itself nor the interaction between extension and affordability had significant effects on NAM use. The results do not confirm Blomberg's hypothesis about *enactive motion* as a primary motivator in the experience and use of NAM. These results are similar to the results found by Stosic and group, (Stosic et.al., 2015). An analysis within images, showed interesting results. While the overall number of NAM expression is the highest for objects that extend into depth and afford human motion, we also have pipes eliciting high number of NAM expressions. Blomberg's appeals to the factor of 'Boundary change' as the reason for the high NAM expressions (cf. Blomberg, 2014). I propose that depth perception could also be playing a role in the high number of NAM expressions describing pipes that go away into the distance in depth.

3.1.5 Across images analysis

A closer look at the spread of NAM expressions across images gives the following picture:

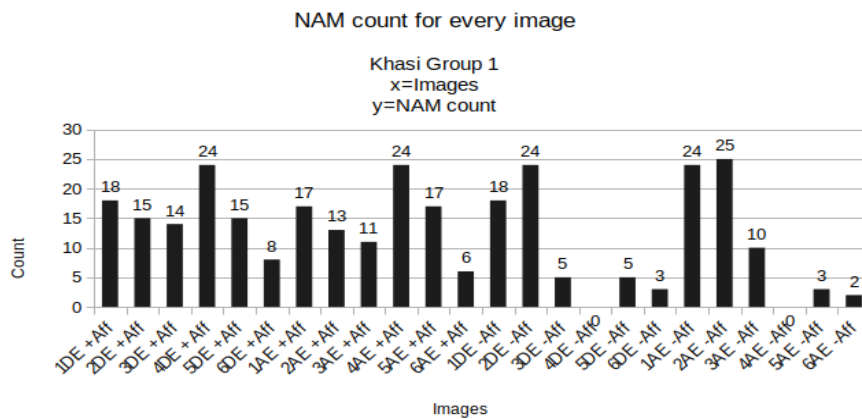


Figure 3.4: NAM count per image (Khasi, grp1)

While there is an overall higher tendency to speak of objects that afford human motion, presented to observers as extending into the distance (depth-extension), this did not happen for every image. The following image (Fig.3.5) had the least number of NAM expressions of all depth-extended objects. One of the possible confounds in the picture is the background of the image, the water, which is itself in motion. Hence the motion verbs used are focused on the background, while the stone-path is an object sitting in moving water, which was the case in most of the descriptions.



Figure 3.5: DE+Aff6: Depth extended object, affording human motion

Image DE-Aff1 which is an image of a pipe extending in depth has one of the highest NAM descriptions, with DE-Aff2 having a relatively high number of NAM expressions as well. Both these are images of pipes extending into a tunnel and the high number of NAM expressions could be attributed to depth perception as proposed in the previous section.

In the other cases with very low numbers of NAM expressions, there are a number of factors that could have affected their production. One, the physical dimensions of the foreground object(s). When we experience the physical dimensions of objects in our visual field, these dimensions have an effect on our perception, apart from our shared knowledge of them. Think for example of a regular small sized TV screen vs a TV screen that is large and covers a wall. A description similar to the following (4) would be acceptable in the case where the TV screen is large and covers a big part of the wall

4. The new TV in his house stretches across his wall.

There are therefore, in particular, with visual scanning, physical dimension factors that could play a role in how we see the world. In this particular experiment, for example, the figure with the highest number of NAM expressions is Fig.3.6 and the lowest is Fig.3.7, (corresponding

to image AE-Aff2 and DE-Aff4 respectively). Further studies need to be done to look at the physical dimensions that allow for NAM expressions. What we know currently is that co-extension paths or communication types (Stosic et al., 2015), in this case images with roads, bridges and pipes have the highest number of NAM, as attested in corpus studies in Spanish, English, French, Italian, German and Serbian and Chinese (Rojo and Velenzuela, 2003; Stosic et al, 2015; Ma, 2016).

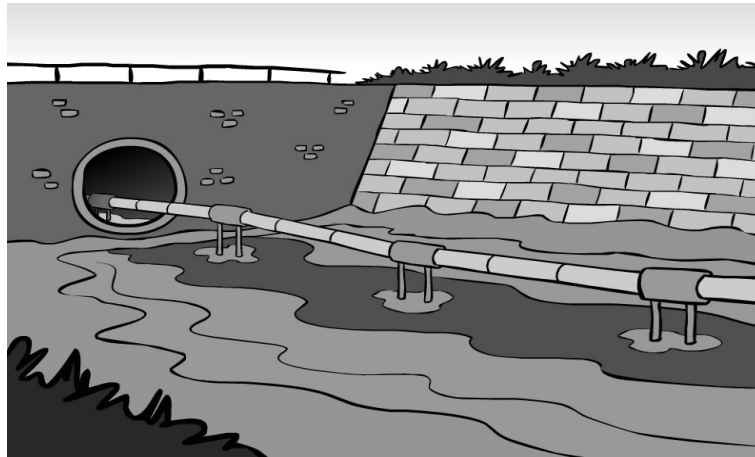


Figure 3.6: 2AE-Aff: Accross extending object, does not afford human motion



Figure 3.7: DE-Aff4: Depth extending sequence of objects, does not afford human motion

The problem with Fig.3.7 (DE-Aff4 on the graph) could be both that we see chairs as individual items that do not therefore by themselves stretch or go anywhere. This could possibly confound the elicitation of NAM expressions. The second problem with this image is a cultural one for Khasi speakers. For one, the lack of beaches in the area or wide water fronts and

perhaps even the experience of beaches itself. Most participants borrowed beach from English while describing this scene or referred to it as a lakeside. Even so, chairs on the beach and sunbathing is not a leisure activity that is practiced in Meghalaya. In fact, as in most regions of South Asia, most adult Khasis prefer a lighter skin shade to a tanned one and the concept of tanning is not popular. These are cultural effects that could also play a role in the production of NAM expressions within the confines of this study. As we can see in the graph, AE-Aff4, the ‘extension across’ perspective of Fig.3.7 also has one of the lowest NAM elicitations.

3.2 Linguistic data

Different types of sentences elicited are included in the appendix. These sentences describe extended entities either as static objects or as objects in motion. Structurally, they are mostly sentences with relative clauses, and at times short simple sentences. These contain tokens of path-conflating, manner-conflating, path+manner -conflating motion verbs, compound verbs as well as sentences with no verbs at all with reference made to the source and to the destination (from...to...). These sentences also illustrate the use of deictic markers, case markers and adverbs, to highlight features of the extended objects, such as its shape, direction and destination. The entire data set has not been included in the appendix, for lack of space. However, the different types of descriptions given by the participants have been adequately covered.

3.2.1 Linguistic analysis

To analyse the data, we look at the following aspects of the participants’ descriptions:

- When talking about the extended property of the objects, do speakers use static terms or fictive terms or a combination of both?
- When using static terms, how do they convey extension?
- When motion expressions are used to describe these objects, we examine the ways in which the figure (the extended object) is referred to in relation to the ground(s).

While analyzing the data, we additionally look at ‘boundary crossing’ (sometimes referred to as ‘region change’), which Slobin (1996) linked to the use of path verbs in Spanish. This was also incorporated by Blomberg (2014) into the design of his experiment. While direction is often treated as a part of path, we differentiate between the two and treat direction as a separate element of analysis, following Zlatev and Yangklang (2004) and Blomberg (2014) and Ma (2016).

3.2.2 Verb types and frequency count

The semantics of space is spread out between different word classes, however, the information of motion is largely focused on the verb. The following table gives a picture of the kind of verbs that were used by the participants in the experiment. It contains all the verbs found in the study. Two verbs were added to the table reported in Wahlang and Koshy (2018) - *pas* ‘pas’ and *konek* ‘connect’, which were borrowed from English to Khasi.

Manner	Path	Direction	Cause	Path+ manner	Path+ direction	Manner+ direction	Other	Total
5	8	2	2	5	2	1	3	28
<i>jaʔd</i> 'walk'	<i>ka:m</i> 'cross'	<i>leʔt</i> 'go'	<i>(ja)-lam</i> 'lead'	<i>ksam</i> 'claw'	<i>wan-pɔi</i> 'come-reach'	<i>leʔt- ja:ʔd</i> 'go-walk'	<i>btɛŋ</i> 'connect'/ 'continue'	
<i>pon</i> 'bridge'	<i>pɔi</i> 'reach'	<i>wan</i> 'come'	<i>pin-peɪ</i> 'cause-tear'	<i>sam</i> 'pierce'	<i>wan-miʔ</i> 'come-exit'		<i>ta:n</i> 'draw'	
<i>pʰai</i> 'tum'	<i>ruŋ</i> 'enter'			<i>par</i> 'crawl'			<i>konek</i> 'connect'	
<i>kɜ:r</i> 'surround'	<i>miʔ</i> 'exit'			<i>pʰruŋ</i> 'insert'				
<i>tɪŋkʰɔʔ</i> 'hit'	<i>sdaŋ</i> 'start'			<i>ŋam</i> 'go under'/ 'dive'				
	<i>kut</i> 'end'							
	<i>ke:w</i> 'climb'							
	<i>pas</i> 'pass'							

Table 3.2: Khasi verb repertoire

The list points to a very varied repertoire of verb-types used by participants. In terms of verb types, the biggest verb type is the set of Path verbs. This is followed by the set of path + manner conflating verbs.

In terms of verbs that were used most frequently however, the following table shows that manner and path verbs are the most frequently used. The high frequency use of a few verbs is similar to the case in English, in contrast to the more equally spread out use of verbs in Spanish, as reported in an English – Spanish study (Rojo and Velenzuela, 2003). This is possibly because *jaʔd* can be combined with a number of satellite words to express path. The high frequency of path-conflating verbs *miʔ* and *ruŋ* is facilitated by stimuli containing changes in boundary, as we will see further in the chapter.

Verb	Translation	Category	No.of times used
<i>ja:ʃd</i>	walk	Manner	149
<i>miʔ</i>	exit	Path	49
<i>ruN</i>	enter	Path	40
<i>jalam</i>	lead	Cause	22

Table 3.3: Khasi: Most used verbs (Wahlang and Koshy 2018: 47)

Khasi also encodes spatial information about path and motion by case markers, deictic markers, prepositions and adverbs, as listed below:

	Translation	Word Category
<i>ha</i>	Locative	Case marker
<i>na</i>	Ablative	case marker
<i>fa-</i>	Allative	case marker
<i>-ne</i>	proximal	deictic marker
<i>-to</i>	Medial	deictic marker
<i>-ta</i>	Invisible	deictic marker
<i>-tey</i>	distal-up	deictic marker
<i>-neŋ</i>	High	deictic marker
<i>-lɔr</i>	Top	deictic marker
<i>-pɔʔ</i>	Interior	deictic marker
<i>-bar</i>	Exterior	deictic marker
<i>-duʔ</i>	End	preposition
<i>k^hmat</i>	front	preposition
<i>pdeŋ</i>	center	preposition
<i>liŋba</i>	through	preposition
<i>beɪt</i>	straight	noun-modifier
<i>ʃrɔŋ</i>	Long	noun-modifier
<i>ʃille^w</i>	Deep	noun-modifier
<i>beɪt-(beɪt)</i>	straight	adverb
<i>siak</i>	straight up and precise	adverb
<i>ter-(ter)</i>	continuous and in a line	adverb
<i>piɾfaʔ</i>	against	adverb
<i>ʃi-linter</i>	one-breadth (whole breadth)	adverb
<i>linter</i>	continuously	adverb
<i>-b^ha</i>	Very	adverb
<i>rintiʔ</i>	neat	adverb

Table 3.4: Satellites used in Khasi (Wahlang and Koshy, 2018: 48)

3.3 NAM as represented in Khasi

Khasi uses motion verbs and spatial deictic categories to represent NAM. The types of verbs used include manner-conflating verbs, path-conflating verbs, deictic verbs, and compound verbs. Direction and location are expressed through case markers, prepositions, and deictic markers. In addition, path and direction are also expressed using adverbs or reduplicated structures. The compound verbs used in NAM expressions are of special interest because of the encoding of both path and manner in these verbs when describing actual motion. For example, when describing objects in kinesis, Khasi expressions like *wan-ja:jd* ‘come-walk’, encode information about the manner of motion, speed and direction of the path. Of these, the manner and speed of motion are encoded in *ja:jd* and the direction of motion towards the speaker by *wan*, a deictic verb. Another compound verb describing motion is *wan-ra?* ‘come-carry (bring)’. *wan* ‘come’, which has a deictic component, adds direction to the verb *ra?*. However, *wan*, even though a deictic verb by itself, is often accompanied by explicit deictic components like *phai* as in *wan-phai* ‘come-turn (return in the direction of the speaker or hearer)’. This is in contrast to the expression *le^jt -p^hai* ‘go-turn’ (return in the direction away from the speaker or hearer). While these and other compound verbs are expected to be found in the descriptions of NAM, it is important to investigate if NAM contexts lead to any change in the semantics of the verbs).

3.3.1 Description of object properties

When describing properties of objects, like being straight or extended, modifiers like *jrɔN* ‘long/tall’ and *be^jt* ‘straight/directly’ are used. We see these in descriptions exemplified in descriptions in this chapter, which are constructed in relative clauses. Images presented are often described with relative clauses and not with short simple sentences containing attributive adjectives. This is in conformity with the general Khasi pattern where modifiers of nouns (including relative clauses, numerals, adjectives, etc.) appear post-nominally. These modifiers are introduced by a relativizing particle *ba-*, which links them to the preceding nominal by carrying the gender marker of the noun.

3.3.2 Static descriptions

In cases where the participants did not use NAM to describe objects, the often enumerated the objects they saw in the image.

5. a. *Don ar-tilli* *ki-jɪN-k^haN-jit* *i-jɛN* *ba-rit*

Exist two-NON.HUM.CL 3PL-NMZ-close-glass 3DIM-house REL-small

‘There are two windows, a house that is small,

b. *i-wei i-ʃiN-kʰaN ki-pʰlaN bad ka-linti-jad*

3DIM-one 3DIM-NON-CLOSE 3PL-grass and 3FSG-path-walk

one door, grass and a path’. (Wahlang and Koshy, 2018)

The enumeration was not always devoid of spatial information as in the case of example 6). In the following example, we see that the participant uses spatial terms but does not use NAM expressions.

6. a. *ka-linti ka-ba-bejt bad ha-rud ʃoN-ka-ne-ka-linti*

3FSG-path 3FSG-REL-straight and LOC-side GEN-3FSG-PROX-3FSG-path

‘A straight path and on the side of this road’.

b. *ki-don ar-tilli ki-den bad ar-tilli ki-maw*

3PL-exist two- NON.HUM.CL 3PL-tree and two- NON.HUM.CL 3PL-stone

there are two trees and two stones’. (Wahlang and Koshy, 2018)

3.3.3 FoRs

The kinds of FoRs used by participants include object-centered: *ka-diaN* ‘left’ and *ka-mon* ‘RIGHT’, and *ha-rud* ‘LOC-side (side)’.

There were no instances of the use of geo-centric FoR, most likely due the type of stimulus.

3.4 Motion

Motion is expressed through manner conflating verbs, path+manner conflating verbs, direction+manner compound verbs and adverbs. The verb *ja:ʃd* ‘walk’ is often bleached of its manner information, but when used in sentences with more than one motion verb, it may retain information about manner. The other instance when it retains manner of motion is when it is used with the deictic verb *wan* ‘come’.

7. *na-ʃoʔi ka-wei ka-linti ba-ja:ʃd ʃa-jeN*

SG-see 3FSG-one 3FSG-path REL-walk ALL-house

‘I see a path that walks to a house.’ (Wahlang and Koshy, 2018)

3.4.1 Manner

In 10, the sense of motion comes from the presence of the allative marker *fa* when used together with the bleached verb *ja:^jd*. However, when *ja:^jd* is used with a path+manner conflating verb, it retains its manner information, as exemplified in the following example:

8. *u-pait-um u- ja:^jd lɪnba u-lum-baʔ bad u-ksam lɪnba u-lom*
 3MSG-pipe-water 3MSG-walk through 3PL-mountain-big CONJ 3PL-claw through 3MSG-mountain
 ‘A water pipe walks through and claws through the mountain.’ (Wahlang and Koshy, 2018)

Similarly when used as part of a compound verb, *ja:^jd* retains its manner information. In the example below, it appears along with a deictic verb *leʏt* ‘go’ which is also generally used in its bleached form, in that it doesn’t always retain its deictic information. When they appear together however, both of them retain information about deixis and manner respectively:

9. “*ka-lɪnti ka-ba lejt- ja:^jd ka-ba tɪN-k^hoʔ ha-k^hmat-ʃɪN-k^han*
 3FSG-trail 3FSG-REL go-walk 3FSG-REL hit LOC-front-NMZ-close
 ‘A trail that goes-walks hitting the front of the door.’ (Wahlang and Koshy, 2018)

Example 9) is also interesting because of the use of the word *tɪN-k^hoʔ* ‘hit’, a manner-conflating verb to express the road going straight to the house. Since the relationship between the trail or path and the door is an odd one in the context of Meghalaya or India, in that roads and paths do not go to a house, this relationship which is unusual for the participants was expressed in this example by the word hit. In this case. This culturally odd relationship was also expressed by one of the participants using a modal verb, as exemplified below:

10. *ka-don ka-wei ka-lynti ka-ba-hap ban-run ha-je:N*
 3FSG-EXIST 3FSG-one 3FSG-trail 3FSG-EXIST-must INF-enter LOC-house
 ‘There is a trail that has to enter into the house’

While verbs like *ksam* ‘claw’, *sam* ‘pierce’ and *p^hrun* ‘insert’ are used to express both path and manner, and manner inflating verb that was used to express physical configuration while being under the earth was found to be used for objects that were inside a tunnel:

11. ...*u-paip* *u-par* *nan-ta- na-pɔʔ- ʃɔN-u-lom*

...3MSG-pipe 3MSG-crawl ABL-invisible-ABL-INTERIOR-GEN-3MSG-hill

‘A pipe crawls from that from inside of the hill...’ (Wahlang and Koshy, 2018)

12. ...*ka-ta* *ka-surɔk* *ka-par* *na-pɔʔ- ʃɔN-u-lom*

...3FSG-INVISIBLE 3FSG-road 3FSG-crawl ABL-INTERIOR-GEN-3MSG-hill

‘That road crawls from inside of the hill...’ (Wahlang and Koshy, 2018)

The use of *par* in 11) and 12) is reminiscent of the use of potentially translocative verbs encoding information about velocity in his Thai data (Blomberg, 2014), although in this case it had more to do with the way a body is configured while moving under the earth. In Khasi the use of *par* can be mapped to velocity, but in this case it was only used for objects in a tunnel, which relates more to movement under the earth rather than velocity.

3.4.2 Region, Path and Direction

Region, path and Direction are expressed through case markers, deictic markers, adverbs, prepositions, path-conflating verbs and deictic verbs. The information about region and path is often expressed through a combination of the use of path conflating verbs and case markers. Sometimes the change in boundaries is expressed through the combination of entry/exit verbs along with case+deictic markers. However, when a bleached motion verb is used, the deictic markers signifying interiority and exteriority necessarily follow the case marker.

13. a. *ka-surɔk* (*ka*)-*ba* *run* *ʃa-pɔʔ-ka-tʌnəl*

3FSG-road 3FSG-REL enter ALL-INTERIOR-3FSG-tunnel

‘A road that enters into a tunnel;

- b. *ni ni-peit* *ja-ka-ne* *ka-surɔk* *na-pden-ʃɔN-ka*

3PL 3PL-look ACC-3FSG-PROX 3FSG-road ABL-centre-GEN-3FSG

we are looking at this road from its center.’

- c. *ka-run* *ʃa-ka-tunnel* (*ka*)-*ba* *jillew*

3FSG-enter ALL-3FSG-tunnel 3FSG-REL deep

it enters into a tunnel which is deep.’ (Wahlang and Koshy, 2018)

Example 13) is interesting in that it also explicitly states the view of the speaker. In addition, we find in this example, both instances of the entry verb being used with and without a deictic marker. Compare this to the following sentence:

14. *u-payt u-ba ja:^jd be^jt-be^jt ja-bar na-krem ja-bar*
 3MSG-pipe 3MSG-REL walk straight-straight ALL-EXTERIOR ABL-cave ABL-outside
 ‘A pipe which walks very straight to the outside, from the cave to the outside...’
 (Wahlang and Koshy, 2018)

As Wahlang and Koshy noted, deictic markers, marking interior and exterior are used to express region change and unless followed by the preposition *linba*, verbs that do not express path related semantics are necessarily followed by these deictic markers. In Khasi the middle of a path, Path: Mid is not available through path verbs and participants borrowed the verb ‘pass’ from English to express it.

Example 14) also has an instantiation of the use of a reduplicated adverb. Reduplication is abundant in Khasi, especially with adverbs, to express manner of motion. The *Khasi-English* dictionary (Bars, 1973), lists about a hundred adverbs (including reduplicated forms) that can appear with the verb *ja:^jd*. Explorations in the field of actual motion could shed light on the intricate ways in which manner is encoded in Khasi through adverbs. Nevertheless, these adverbs are very interesting because they convey different kinds of path information. For instance, in example 14) what is being expressed is the straightness of the trail and in addition to that, the one-to-one relationship between the figure and the landmark. It means that the road does not fork towards multiple landmarks. This is analogical to the use of “going straight home” that is used in English. In addition to *be^jt-be^jt*, the other adverbs used were *siak* used along with *ja:^jd*, which translates to ‘walking precisely straight ahead’. Continuity is also expressed through the adverb *ter-ter*, which was described as “*ryntih bad khlemsangeh*” (Kharkongor, 1968), and translates to ‘neatly in a sequence, without stopping’.

Khasi has a very rich system of deictic markers. Apart from the usual categories like proximal and distal, Khasi also recognizes a rare deictic category of region-interior. Khasi forms like *ja-rum* ‘to the lower part of X’, *na-rum* ‘from the lower part of X’, and *ha-rum* ‘in the lower part of X’ represent this deictic category. *-rum* is used when spatially locating an object on a point of a slope. This deictic marker differs from *-t^he* ‘down there’ in *u-t^he* ‘the male down there’ or *ja-t^he* ‘to the place down there’ (Diessel, 1999). *-t^he* has the features [+distant], [+down], while *rum* is [+lower]. In example 18 involving multiple deictic markers, we have a fence that is described as going from land into the water. It is described using a series of

case and deictic markers. The change of boundary is expressed by a combination of case markers. The combination of deictic markers and case markers can by themselves mark changes in boundary and direction.

15. (...) *naN-ne fa-tei fa-po? ka-um*

ABL-PROX ALL-DIST ALL-INTERIOR 3FSG-water

‘from here to there into the water’ (Wahlang and Koshy, 2018)

3.5 Point of view and the uses of deitic verbs and entry/exit verbs

Apart from encoding NAM expressions, one of the basic uses of the entry and exit verbs is also to express the point of view of the speaker. This is also noted in the case of the use of compound verbs with deictic components. Both *mi?* “exit” and *run* “enter” are used to describe changes in region or crossing of boundaries by an object. While the use of the entry and exit verbs are not restricted to a first-person point of view, the structures elicited have ended up elucidating the visual position taken by the participant, whenever the object extended in depth. This allows us to tell whether the participants placing themselves within the picture in an angle which looks into or outwards from the tunnel. For example, when images depict a change of region from within a tunnel to the outside, the preferred NAM verb is *mi?*. When the verb *mi?* is used, one understands that the point of view used is of the speaker from within the tunnel looking at a road going outside. The entry verb “*run*” is used in the opposite direction when compared to *mi?*, to describe images with objects crossing boundaries from the outside to the inside of a tunnel. The placement of the tunnel on the right or the left end of the image makes no difference in the verb used.

While exit and entry verbs are very strongly correlated to the direction of extension that the participant assumes, we also find that participants prefer the use of *fa*, the allative case marker in combination with *ja:ʔd* “walk” for images with depth extension. There is a general assumption of extension as going into the image and not towards the speaker. With images involving across-extension, there seems to be no preference for the direction of the gaze with the gaze being guided by the position of the landmark, with the extension ending at the landmark, expressed through the use of a verb + allative case marker (Wahlang and Koshy, 2018).

3.5.1 Non-actual path

Sometimes dynamicity or continuity is not expressed with motion verbs but with other words and phrases. A sentence like ‘this road continues all the way to the coast’ conveys a sense of motion even in the absence of motion verbs. Blomberg (2014) categorizes these as non-actual path. In Khasi, we see such structures with the verbless sentences describing a bridge. The continuity is expressed through case markers *na...fa* and the kinetic information they provide gives such structures a sense of dynamicity. Similarly, the use of the form *sdan...kut* ‘start...end’ describes the event/action/process to have had a beginning and an end, giving the description as a whole a sense of continuity. The use of the verb *bteN* ‘continue’, similarly, provides a sense of a process or an action that has started but not ended even though it is not a motion verb (Wahlang and Koshy 2018). Consider the following examples:

16. ...*ki-jin-ker* *ki-ba* *sdan na-u-ne-u-deN*
 ...3PL-NMZ-fence 3PL-REL start LOC-3MSG-PROX-3MSG-tree
 ‘Fences that start from this tree’
17. *ha-du? ba kut fi-linter* *ʃɔN-ka-ne-ka-madan*
 LOC-TILL REL end one-breadth GEN-3MSG-PROX-3FSG-ground
 till the end, the whole breadth of the ground...’
 (Wahlang and Koshy, 2018)
18. *ka-jin-ken* *ka-ba* *na-fi-lian lom* *fa-fi-lian lom*
 3FSG-NMZ-sling 3FSG-REL ABL-one-side hill ALL-one-side hill
 ‘A bridge from one side of a hill to a side of another hill...’
 (Wahlang and Koshy, 2018)

3.6 Conclusion

The results of the behavioural data showed that affordance of motion is the only feature that has a significant effect on NAM. The orientation of the object had no significant effect on the use of NAM expressions. Although in terms of absolute numbers the condition DE+Aff elicited the largest number of NAM expressions, the interaction between extension and depth, within which we would find the condition representative of enactive motion, had no significant effect

on NAM production. The difference in results between this experiment and the one conducted by Blomberg could be due to the ways in which the stimuli was rendered or to the cultural differences between Sweden and the Khasi hills.

For NAM, Khasi speakers frequently use manner verbs, path verbs and path + manner conflating verbs. However, the data shows that participants talk not only about figure and ground in terms of path, manner and deixis, but also relationship in much greater detail through the use of adverbs. We find a distinction being made between path and how the figure approaches the ground, information on precision and destination in the use of adverbs. This ground-figure relationship also finds a nuanced description in the use of path+manner verbs, which express the way in which the object changes boundaries and how the body configures itself into a different spatial layout. These relations between figure and ground need further exploration. The most frequently used verb for NAM expressions is *ja:ʃd*, a manner verb. It occurs in its bleached form in most cases and is used for all types of images, along with allative or ablative case markers. Direction is expressed through case markers, which always accompany a motion verb, regardless of what it conflates with the verb's motion information. The language also has a rich repertoire of deictic markers which are used to express region change when coupled with case markers. Deictic markers are used to indicate distances or to give an approximation of the length of extension by the use of proximal or distal markers. In addition, deictic markers are also used to mark changes of region, from the inside of a tunnel to the outside or vice versa. While *ja:ʃd* is used across image types, the second and third most frequently used verbs *mi?* 'exit' and *run* 'enter', are used for images where objects change boundaries, confirming Slobin's hypothesis that boundaries elicit path conflating verbs (Slobin, 1996). These verbs also convey the direction of extension of the object from the speakers' perspective, for images with objects that had depth extension. In the generic use of the motion verbs *wan* 'come' and *leʃt* 'go', there is an element of deixis which is used to denote the speaker's point of view. Compound verbs retain information about path and manner, when used with deictic verbs. The differentiation between direction/deixis from path that is accentuated in Khasi through the use of compound verbs. In addition, while Khasi follows the path and manner conditions as proposed in Matsumoto (1996) particularly in the case of *ja:ʃd*, manner+path conflating verbs do not follow his Manner condition. In terms of Blomberg's typology, Khasi has non-actual path, non-actual motion and non-actual movement. We find non-actual movement in structures involving the verb *par* 'crawl'. Although rare, it is used three times in our data to describe a physical configuration of roads and pipes going through a tunnel. Similarly, the word *pon* 'bridge' in Khasi refers to an act performed by the bridge. Blomberg's hypothesis about the classification of languages based on the expressions used for NAM, that a language having

non-actual movement would have non-actual movement and path as well, applies to Khasi as well, giving us the following schemata:

Non-actual path > Non-actual motion > Non-actual movement

Verbs like *par* ‘crawl’ point to the variations in the types of manner information that languages encode in NAM, a point made by other scholars as well (Rojo and Velenzuela, 2003; Blomberg, 2014). It would be interesting to systematically explore further the types of manner information that are allowed by different languages in representing NAM expressions. To simplify and categorize Khasi into a Satellite-framed or Verb-framed language, or even as an equipollent language, is difficult, and we find that speakers produce verbs in ways that suit the stimuli, using path-conflating verbs very often when talking about changes in boundary. However, due to the propensity for the use of *go+satellite* it points in the direction of a satellite language in terms of habitual preference of encoding path in other word categories. A study of actual motion would shed more light on the matter.

Chapter 4

Bridging Multilingualism and NAM

In the previous chapter we have looked at the data presented by Khasi speakers - 1) behaviorally and 2) the kind of resources they use to describe the property of extension of objects. While the report of that study is presented as a monolingual one, as indicated in the introduction, this population is not monolingual. This chapter sets out to explore the possible differences in behavioral and repertoire differences in object descriptions, as an effect of the sample population's multilingual character. The aim is to explore the potential interactions between language and cognition.

Research on language and cognition has been predominantly investigated through cross-linguistic studies. Studies probing the relationship between language and thought were largely propelled by the Sapir-Whorf relativity theory. This theory stemmed from the works of Sapir and Whorf, who challenged the hierarchies that languages were put in by earlier scholars of languages, like those of Herder and Humboldt. While scholars like Herder and Humboldt, in particular called for a cross-linguistic study of languages as a crucial element of understanding human behaviour, they nevertheless placed languages in hierarchies, with inflectional languages put on the highest rung (see Brown, 1967). This hierarchy was challenged by Sapir and Whorf, through their serious invitation to an understanding and equal treatment of the “logics of native languages” as Whorf puts it (see Carroll, 1956). In addition to a call for removing this hierarchical structuring of languages, Sapir also calls for a reflection on the effects of language on the scientific theories itself, encouraging students of linguistics to go beyond the structures they are accustomed to in formulating broader linguistic systems (Sapir, 1921). This non-hierarchical cross-linguistics study has been followed by many linguists who followed the more descriptive school of linguistics. More recently, studies by scholars like Levinson and Wilkins, Lucy, Bylund and Papafragou have looked at different ways in which grammars carve out and encode

space and spatial objects, turning the field of spatial grammar into a separate and important field in itself (Lucy, 1996; Levinson and Wilkins, 2006; Levinson, 2003; Papafragou et al., 2006). These studies have also been accompanied by investigations of other aspects of cognition, like attention and memory in relation to language variation, i.e., non-linguistic cognition has been experimented upon as potentially interacting with linguistic cognition. Studies like Papafragou's point in the direction that language only affects attention in such cases where a linguistic task was given (Papafragou, 2008). In the absence of a linguistic task, no effects of language was seen. A similar conclusion was made in a study looking at how people remembered motion events (Gennari et al., 2002). These conclusions seem to support a hypothesis that language is used as a strategy to communicate and only in such cases do we see the effects of any specific language. These findings supports Slobin's theory of *Thinking for speaking* in which he proposes linguistic effects on other aspects of cognition, for instance categorisation and attention, while a person is in the act of speaking (Slobin, 1991). This appeals to the Whorfian hypothesis of habitual effects that a language has on what we chose to pick out as an important element to encode in our speech. The other field in which this question has been investigated in is therefore in bilingualism/multilingualism studies. These studies touch upon the debates of correlations and interactions between thought and language through investigations of the investigating the relationship between memory, concepts, time perception, motion event perception and lexical items between two languages (Jarvis, 2011; Pavlenko, 2016; Bylund and Athanasopoulos, 2016; Montero-Mellis, 2016).

4.1 Bilingual lexical storage models

The study of bilinguals and bilingualism over the years has largely focused on the question of lexical storage in bilinguals, i.e. whether bilinguals have the same conceptual unit from which they map onto separate lexical units or whether the conceptual structures differ for both languages. The work was pioneered by Weinreich in 1953, through the Saussurean concept of signs and signifiers, in which he proposed three types of bilinguals - the *compound bilingual*, who has a common conceptual unit accessed by lexical units from both languages (two signs and one signifier). The second type of bilingual is the *coordinate bilingual* (two signs and two signifiers), who has two conceptual units which correspond to two lexical units for separate languages. The third type of bilingual is the *subordinate bilingual* who has one conceptual unit accessed only by the L1 lexical unit, the L2 accesses the conceptual unit via the L1, i.e., the signified for L2 lexical item is the corresponding sign in the L1, which then goes to the conceptual signified. The three types of bilinguals correspond to the ways in which a bilingual learns

languages and the ways in which representations correspond to the lexical items (Weinreich, 1953). This work propelled the discussion on bilinguals leading to the current models, which includes the Revised Hierarchical model (RHM) (Kroll and Stewart, 1994).

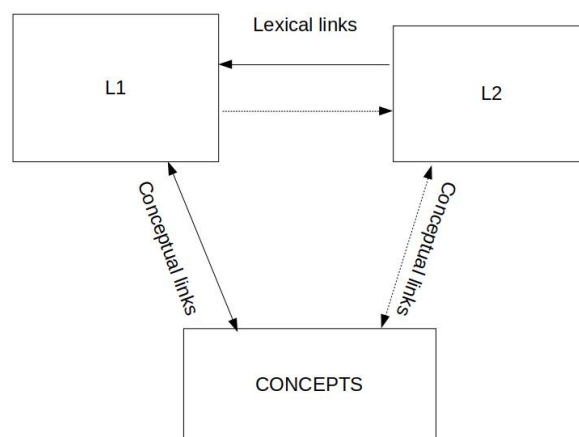


Figure 4.1: The Revised Hierarchical model (adapted from Kroll and Stewart, 1994)

The RHM model has one conceptual level and two separate lexical units for L1 and L2. Depending on the stage of L2 learning or status, the access to concepts can be either direct or mediated by the L1. This model however assumes that there is only one conceptual unit, corresponding to the compound type of bilingual, although it gives room for concepts in the L2 to be mediated via the L1.

The other popular model is Distributed feature model (DeGroot, 1992, 1994) which has two levels of concepts and two levels of lexical units.

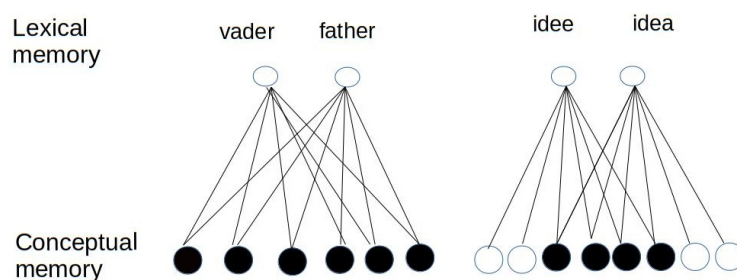


Figure 4.2: The Distributed feature model (adapted from DeGroot, 1992, 1993)

As depicted in the image above, the lexical items from both language in the DFM can share concepts and also exclude concepts. DeGroot's model differentiates between abstract words and concrete words, where abstract words share fewer conceptual links between languages and abstract words share many conceptual links or all. This model is useful for cross-linguistic differences, in that it gives room for differentiating between translatable words from one language to another depending on the context they are used in. However, it does not take into account issues like fluency, or perhaps even a change of concepts depending on the type of bilingual we are talking about. Pavlenko designed a new model based on the RHM, called the Modified Hierarchical model, in which the conceptual level is stratified into L1-specific, L2 specific and shared concepts (Pavlenko, 2009). This of course would allow for both the differentiation in shared and language specific concepts and the ways in which these are accessed as well.

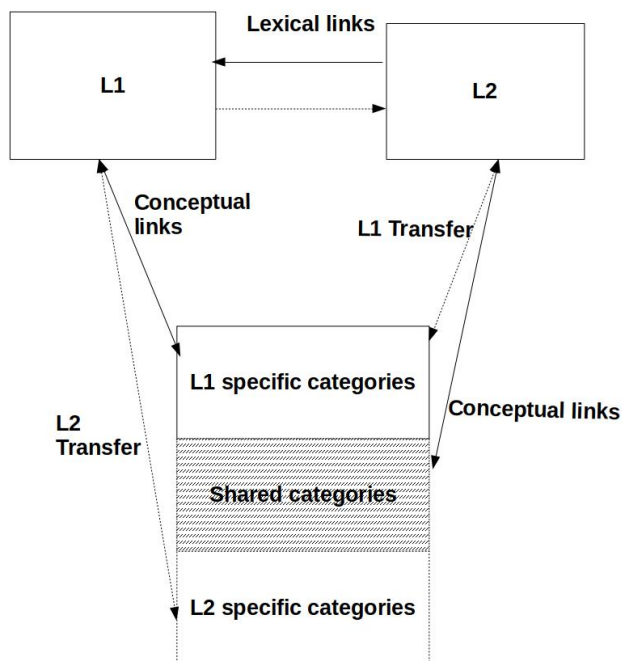


Figure 4.3: The Modified Hierarchical model (adapted from Pavlenko 2009)

These models are geared towards explaining language learning that are better demarcated and individuated as separate systems, with stages of learning documented in the studies, unlike the population in this thesis. This thesis on the other hand, looks at a population which has been speaking English for roughly 18-20 years of their lives. Nevertheless, the MHM seems like a useful model to the study of multilinguals because it accounts for the transfer of concepts between languages in a bilingual and makes room for shared concepts as well. Of the available models, it accounts for inter-lingual interactions which serves us a purpose when investigating a multilingual population such as the one I am looking at. In the next section we take a brief look at a survey report of language use, as mentioned in the introduction.

There are several interesting results of studies in motion event conceptualisation amongst bilinguals, although none exist in the field of NAM. One of the aims of this thesis is also to bridge this gap between multilingualism and NAM. The studies of motion events in bilinguals nevertheless provide insights that are useful for this thesis. Filipovic's bilingual study of memory retrieval in English participants and Spanish-English bilingual participants suggests that

the languages used by the participants affected the details of the motion scene that participants remember (Filipovic, 2011), pointing towards Slobin's theory of language affecting what we choose to pay attention to (Slobin, 1996). The same paper also supports the hypothesis of a single storage system and processing for bilinguals. It is unclear if the intertwined usage of the two storage systems as proposed by Grosjean and Soares (Grosjean, 2001; Soares and Grosjean, 1986) leads to a third system or if there is actually one single storage. In addition to the discussion on storage structures, several studies point to a stronger effect of the Linguistic relativity hypothesis. For instance, in studies of conceptual transfer, such as Athanasopoulos's, there is evidence that English-German bilinguals (English speakers learning German as L2) restructure motion event perception to focus more on the end point of an event, rather than aspect, since German is more goal-focused structurally than English (Athanasopoulos, 2015). The study shows a shift of concept, from the *aspect* of motion towards the *goal* of an object, as a product of their L2 learning. Similarly in a study on the effect of *path* vs *satellite* condition from Spanish to Swedish amongst Swedish L2 learners of Spanish, Montero-Mellis and his team found priming effects of Spanish on Swedish. Swedish is a satellite-framed language whereas Spanish is categorised as verb-framed language. In the experiment, Swedish speakers restructured their descriptions towards more path-encoding sentences in Swedish after reading Spanish (L2) path describing sentences (Montero-Mellis et al., 2016). This is part of a growing number of studies which looks at bilingualism as a unique state in its own right by scholars, instead of the normalised method of only looking at L2 speakers in terms of L1, native like fluency (Brown, 2015).

In chapter 5, the repertoire of verbs used by the same sample population in its Khasi mode will be investigated in its English mode. In addition, the effects of extension and affordability of motion on NAM productions will also be investigated. In their Khasi mode, the affordability of motion had a significant effect on the production of NAM expressions. Extension and the interaction between extension and affordability on the other hand had no significant effect on the production of NAM. This result tallies with the results found by Stosic et al., on their study of NAM in French, German, Italian and Serbian, where affordability was the only fixed variable showing any significant effect on NAM expressions (Stosic et.al., 2015). However, before going ahead, some clarifications need to be made on what English means in the context of India.

In researching speakers who have learned English through non-native speakers of English and whose English is one of the languages spoken a participant, the question of fluency or L1 like performance becomes problematic because the status of English in India is not the same as that of English spoken in the US or the UK. Defining Indian English is not a straightforward

task, given the local English variations affected by the varieties of local languages (Sailaja, 2012). Nevertheless, English is listed a first language for Indians in the 2011 census of India. 2,59,678 people are listed as people whose mother is English (Census of India, 2011). This creates a situation which is conceptually difficult for me in terms of defining what English my participants are speaking about, a problem that has been posited by thinkers debating about concepts of “a language” or “native speaker” (Rajagopalan, 1997; Kachru, 1982; Ferguson and Gumperz, 1960; Moulton, 1969). As far as categorisation goes, Indian English has been recognised as one of the Outer Circle Englishes, generally spoken in previously colonized countries of the world (Kachru, 1985). Attempts have been made to linguistically describe Indian English (IE), despite acknowledgment of the problems in doing so, as Sailaja states about descriptions of IE:

Feature lists, such as the ones given in the literature, have the danger of creating the impression of homogeneity, uniformity and universality. Yet, unless there is a certain degree of homogeneity, the label IE or British English or any other variety, cannot be given. In order to avoid creating the impression of homogeneity for IE, many researchers in India completely avoid attempting a uniform account of all of IE. (Sailaja, 2012:366)

Caution both in terms of the defining what is “English” and “Standard Khasi,” as well as for the choices of models to be used while analysing the data presented here is therefore a desideratum. For the sake of completing the study, these languages refer to 1) Indian English refers to the English that is spoken in India and which is used in official documents and educational settings, 2) Standard Khasi refers to the language spoken as the lingua-franca of the Khasi and Jaintia hills and the one which is spoken in Churches and official documents in the Khasi and Jaintia hills. A more important requirement at this point is the evaluation of the context in which these languages are learned and used. For instance, how well do the L1 and L2 terms apply, in cases where people were/are exposed to say an average of 3 languages in their childhoods? How do competency rules apply when these languages are often used very contextually and where there is continuous language contact with many more different languages? As Aneta Pavlenko points out in “Whorf’s last argument: Multilingual awareness”, the scientific languages and theories that we use across the community that studies multilinguals should be wary of the bias that languages spoken by the researchers impose on the theories (Whorf, 1929; Pavlenko, 2016). It is important to keep in the back of my mind, the fact, that these models are made to explain a formal setting of language learning, and the assumption that non-first languages are learned in relatively clean separated levels. In the case of the current sample populations for instance the

use of languages is very context dependent, with different registers used for different settings. For instance, to speak about school work, the participants in this study use English, for church and religious interactions, they use Khasi, for cooking, they use Khasi, for shopping they use Hindi. In addition to this, this population as mentioned earlier, is a migrant community, who migrated to cities which speak languages that belong to different language families. Given that the sample population is a migrant one, their language contexts change depending on their locations and who they are talking with. They learned both Khasi and English before the age of 12. They also speak other varieties of Khasian languages, Hindi and other South Asian languages and in formal settings, some of them have learned French, German, Russian and Japanese. Despite these complexities, the notion of conceptual transfer is one that is useful in such a setting.

4.2 Language use context in more detail

A survey was conducted amongst a migrant student population to look at the languages they use. 30 people responded. All of them come from Shillong, a city in the North East of India, where Khasi is spoken. All of them are speakers of Khasi from their childhood and self-identify as members of the Khasi community. The following simple bar graph shows the cities they live in:

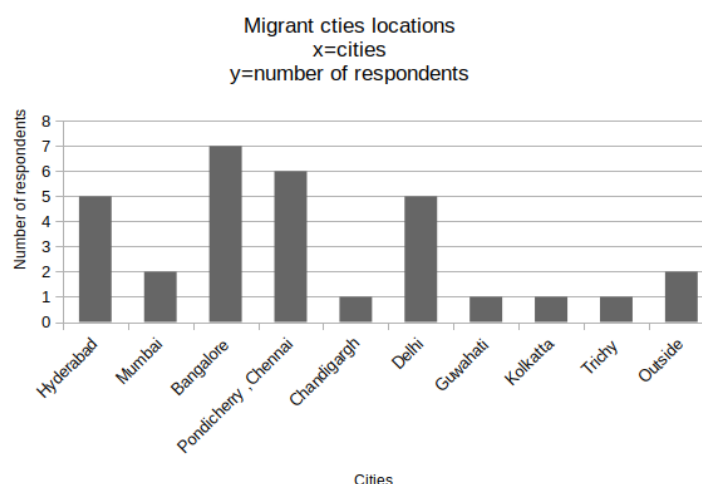


Figure 4.4: Migrant cities and respondents

In response to how many languages they know, they report speaking 3.36 languages, with the highest number being 6 and the lowest being 2. These languages include Khasi, English,

other Khasian varieties, other South Asian varieties (Hindi being the most frequently listed) and foreign languages (spoken outside India). They respond that while in Meghalaya, they report speaking an average of 2.4 languages, with the highest being 5 languages and the lowest being 1. The common language throughout is Khasi and the other responses included English, Hindi, Other South Asian varieties and Other Khasian varieties. To understand the other South Asian varieties, it is important to note that in Meghalaya, the state where Khasi is spoken, Garo, a Baro-Garo subgroup of Sino-Tibetan is also spoken. In addition, Meghalaya shares borders with Bangladesh, and Bengali is 8% of the population. Meghalaya also shares borders with Assam, where Assamese, an Indo-Aryan language is spoken.

To give a brief outlook of the languages spoken by the participants, I will only take the respondents from Hyderabad and Bangalore. In their current residences, the languages spoken in the areas include Telugu and Daccani in Hyderabad and Kannada in Bangalore. However participants have also reported living in Chennai where Tamil is spoken. Telugu and Kannada are Dravidian languages and Daccani is an Indo-Aryan language. In Bangalore and Hyderabad, Hindi and English are also spoken in their universities and workplaces. At work, they listed English and Hindi as languages they use. Some of them also reported using Khasi, presumably to talk with their Khasi friends.

In the cities where they currently reside (their current migrant city), they speak an average of 2.26 languages, with the highest number being 5 languages and the lowest being 1. At work they speak In terms of fluency, they report an average of 2.23 languages as being languages they are fluent in speaking, with the highest number being 5 and the lowest being 1. The languages reported include Khasi, English, Other Khasi varieties, Hindi and a foreign language. The ones who reported 1 language, responded with Khasi or English as being the languages they speak most fluently.

In terms of age, the respondents report learning an average of 2 languages before the age of 12. The highest number of languages is 4 - Khasi, English, Other Khasian varieties and other South Asian varieties. This report has Khasi, English, Other Khasian varieties and Other South Asian varieties (the most common being Hindi). The ones who reported 1 language, reported Khasi as the language they learned before the age of 12. However, they also report going to English medium education schools, which means that they were all exposed to English at an early age. As a followup to this question, they were also asked to list the languages they heard around them before the age of 12 on the radio and television and through neighbours, apart from Khasi. They responded with an average of 1.3 languages. The highest number of languages were 4 and the lowest 0. This is not surprising given that Shillong, the city where the respondent come from has pockets with very low non-Khasi speaking communities and others

with very high non-Khasi speaking communities. The languages listed include English, Hindi, Other South Asian varieties and Other Khasi varieties. Only one respondent listed none as a language heard before the age of 12.

Given this as a background of language use that the sample population comes from, I will use concepts from the models which account for *conceptual transfer* and attempt to look at whether or not this population shows deviations from Standard, Inner Englishes and what the data tells us in terms of how participants use the language resources they have as multilingual speakers, of which English is one of their languages.

Chapter 5

Investigating NAM motivated descriptions in English

In this chapter we explore the multifaceted nature of NAM in the multilingual speakers' in English and look at the resources they use to describe the property of extension of static objects.

5.1 Experiment 2: NAM elicitation in English by Khasi-English bilinguals (same group)

The same participants from the Khasi experiment were asked to repeat the experiment after a period of a month and this time they were instructed to give the descriptions in their English monolingual mode.

5.1.1 Hypothesis

This experiment has the same hypothesis as postulated for the sample population in its Khasi mode. There is an exception the feature +afford human motion to have a significant effect on objects with depth extension, with enactive motion being a primary motivator for the use of NAM expressions. Second, visual scanning would be a second motivator in the use of NAM for objects that are presented as extending across the image. In terms of linguistic resources used however, we have the following questions:

1. Do speakers choose to highlight aspects of Path the same way they did in Khasi?
2. How much of Manner is allowed in English for Khasi-English bilinguals?

3. What are the cross effects between Khasi and English, if any?

5.1.2 Methodology and Design

The methods used and the design follow the same one as followed with the Khasi population. All participants were instructed to only speak in English in during the experiment. The instruction to speak only English was done in English and emphasised, with the intention of inducing the English language mode. They were also asked to try and describe the images in one sentence.

5.1.3 Participants

20 of the 30 participants from the Khasi experiment agreed to repeat the experiment, in English. There was a gap of one month between the two tests for every participant. All of the participants studied in English medium schools and currently live in cities in which they need to converse in English daily, both at their educational spaces and for getting around.

Avg.age	Avg.age	Gender		Khasi	English	Education
25	25	12 female	8 male	Fluent	Fluent	University/College

Table 5.1: Eng (grp1) participant details

5.1.4 Analysis

Before going ahead with the analysis on bilinguals, it is important to note that this is not necessarily an analysis on bilingual effects on cognition. An analysis of the sort would need a testing of other facets of cognition, other than speech. However, what this chapter attempts to do is to look at the way in which Khasi bilinguals talk about extended objects through NAM expressions.

To begin with, each audio recording was transcribed from audio to text. The text was then checked for NAM expressions, and descriptions with a NAM description were assigned 1 and the ones without a NAM description were assigned 0. There were 0 instances of NAM used for Control images. A total of 640 descriptions were recorded. making the difference significant between the test conditions and the test conditions. A total of 480 test descriptions were analysed out of which 256 descriptions contained NAM expressions, which is 53% of all test descriptions.

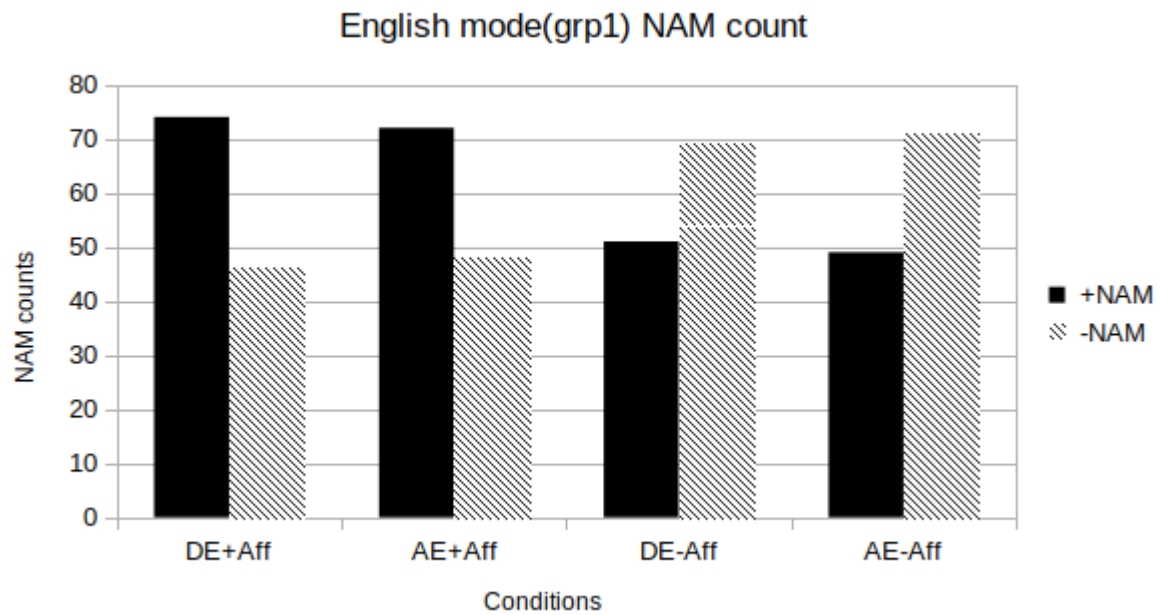


Figure 5.1: English (grp1) NAM count for every condition

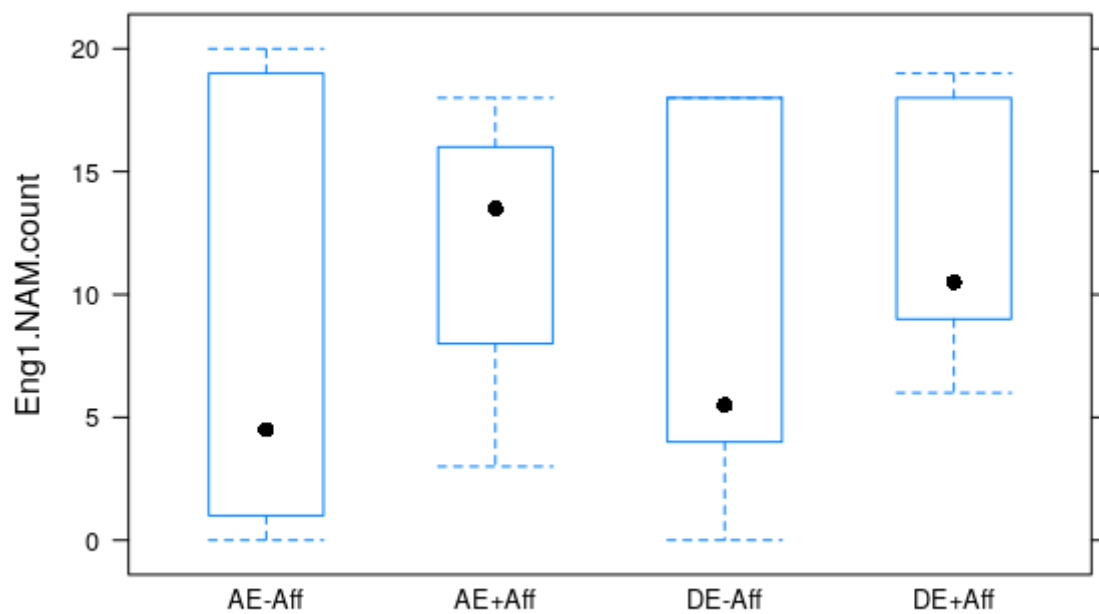


Figure 5.2: English (grp1) NAM across conditions

The images where objects extend into (depth) which do not afford human motion have a higher NAM count than the images with across-extended objects and which do not afford human motion.

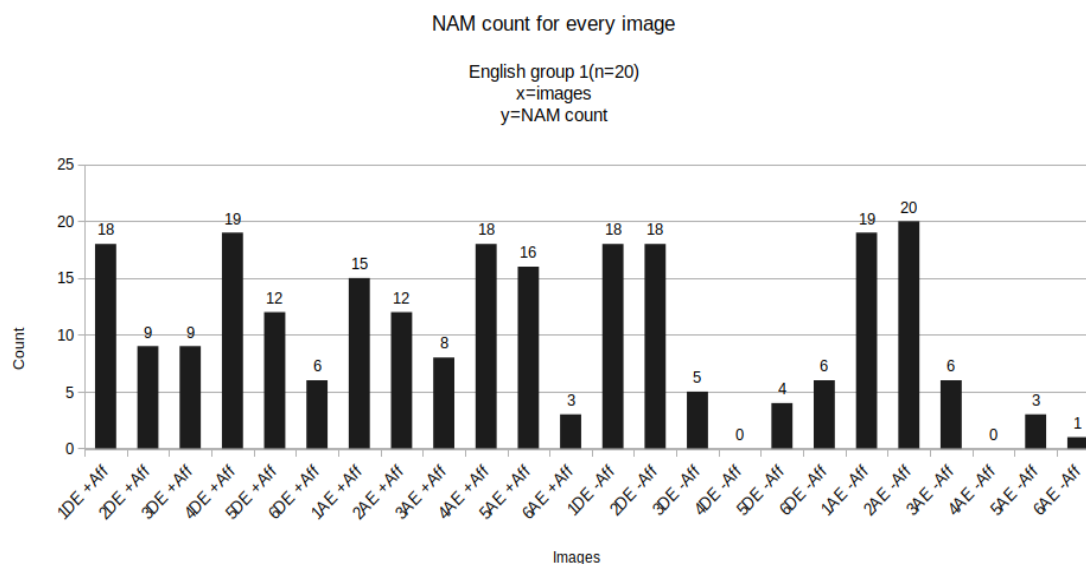


Figure 5.3: Number of NAM used for every image in English (grp1)

The same analysis that was used for the Khasi data, R (glmer) was also used to analyse this data. The differences between participants was accounted for as a random variable, it was found that as in the case of Khasi, the property of Affordability of motion has a significant effect on the use of NAM expressions, $p = 0.003$, while extension had no significant effects. The interaction of affordability of motion and extension also had no significant effects on the production of NAM descriptions. The differences between each stimuli was not taken into account because there was not enough exposure to the same stimuli, and would it require a bigger sample size to take their effects as random variables into account.

The following image gives a graphical representation of the glmer analysis. It shows that in the presence of an object which affords human motion, the odds ratio of there being a NAM descriptions is significantly high. This is not the case for the case of extension in depth or the interaction between depth and affordance of motion, or *enactive motion*. The post-hoc analysis of the test of the interaction between affordability and extension returned a power of ‘5.70%’ (Likelihood ratio test, using powerSim from package simr on R). This power is not adequate to fail to reject the null hypothesis. The effect size (Cohen’s D) between the effect size between the conditions DE+Aff and AE+Aff was small (0.4). One of the factors could be due to small sample size. The recommended sample size for an 90% power with 0.4 Cohen’s D is 172

participants. This number of participants is difficult to obtain and the small sample size could be a reason for the insignificant result.

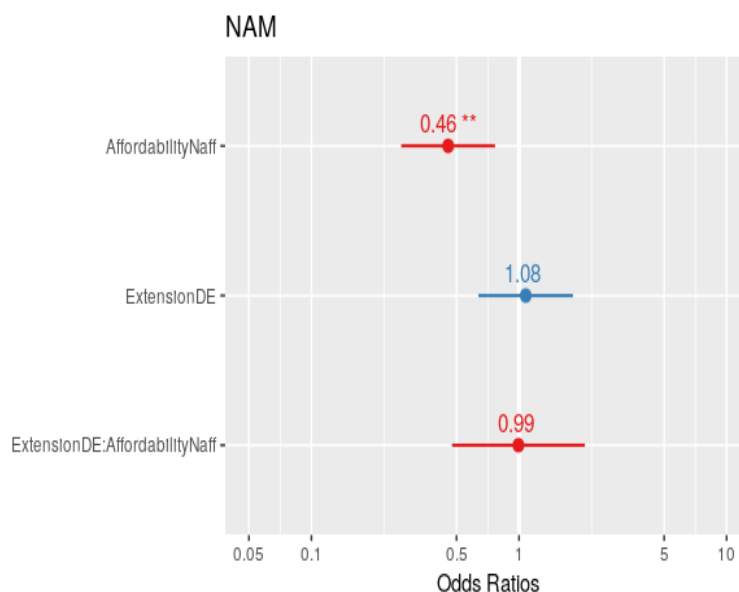


Figure 5.4: Significance levels of affordability, extension and their interaction in English (grp1)

5.1.5 Discussion

The results match the ones in the Khasi monolingual mode. To ensure that the exposure to the same stimuli material was not the one affecting the results, the same experiment is run on a similar sample population, which has not participated in the experiment before.

5.2 Experiment 3 - NAM elicitation in English by Khasi-English bilinguals (untested group)

In group 1, which did the experiment both in Khasi and English, there was a possible confound of memory due to repeated use of the same stimuli. Therefore a new sample population (group 2) was used in Experiment 3 to remove the potential memory confounds. The current population had the same characteristics of the first group, in that the group comprised of students who are Khasi - English multilinguals, studying in Indian metropolitan cities.

5.2.1 Participants

There were 22 participants, with a mean age of 23yrs. They all studied in schools that had English as a medium of instruction and writing and the colleges/University they attended also use English as a medium of instruction.

Avg.age	Gender		Khasi	English	Education
23	16 female	6 male	Fluent	Fluent	University/College

Table 5.2: Eng (grp2) participant details

5.2.2 Methodology and design

The same methodology and design that was used in the first group was used in this experiment. All participants were instructed to speak only in English. They were also instructed to try and describe the images in one sentence, the same way the previous sample population was instructed.

5.2.3 Analysis

As was done for the previous sample population, each audio recording was transcribed into text. Each description were checked for NAM expressions. This (including Non actual path) and a bin count was done, with 1 for +NAM and 0 for -NAM. A total of 792 expressions were recorded out of which 528 were test conditions.

Only one control image was described using a NAM expression out of 265 descriptions. 253 out of 528 test conditions were described in NAM expressions, which is 44% of all test conditions, the same percentage as the Khasi monolingual mode data. The difference between control images and test images is very significant.

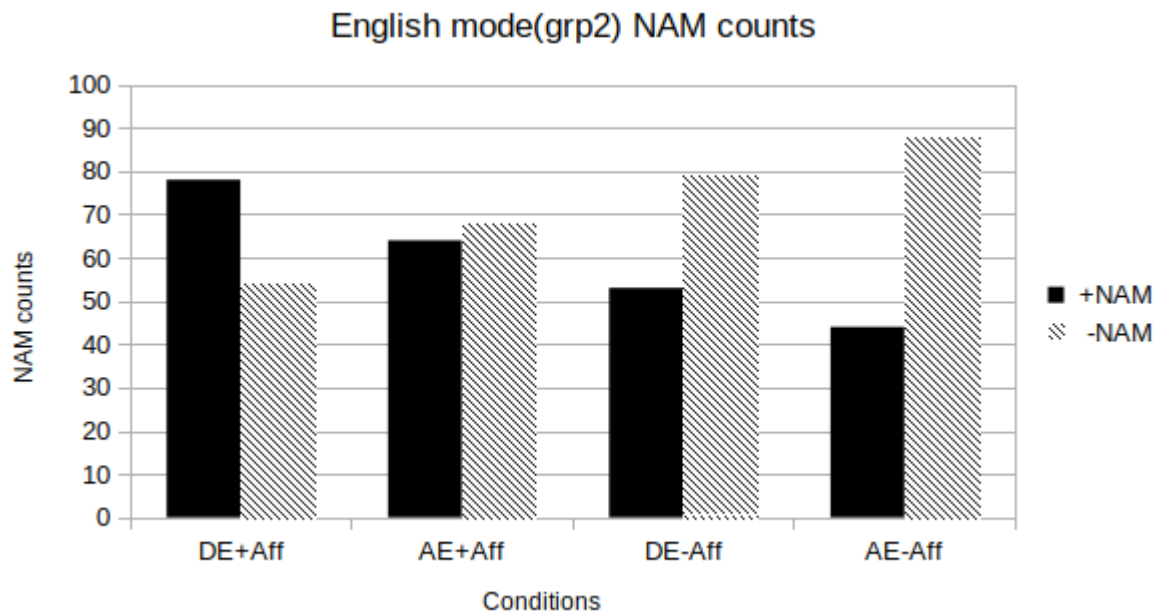


Figure 5.5: English (grp2) NAM count

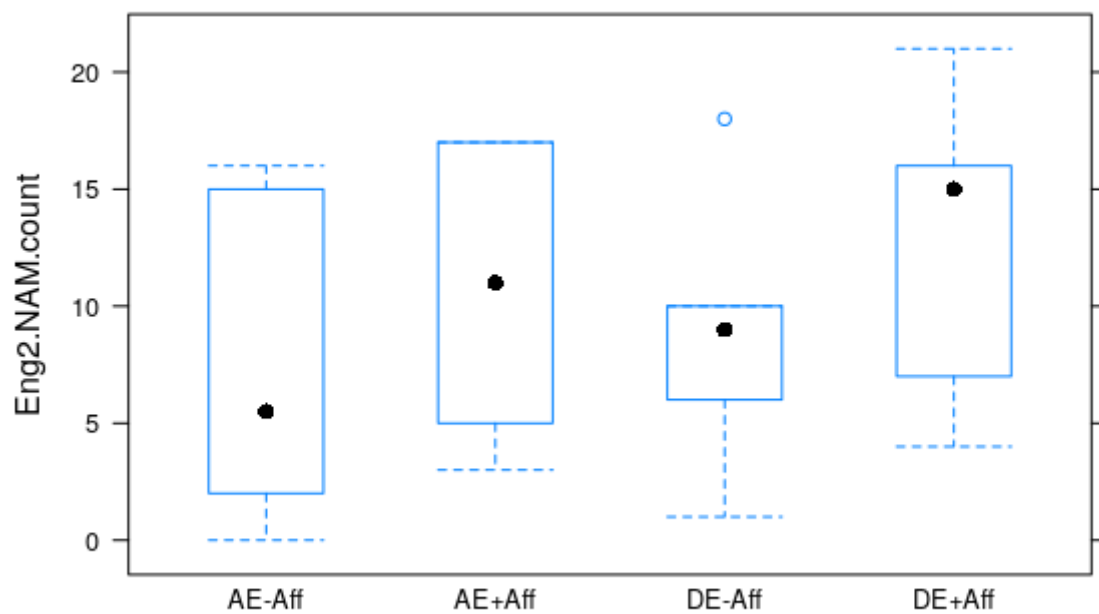


Figure 5.6: English (grp2) NAM across conditions

A similar test was done on the 44% of descriptions to check for the effects of perspective and affordability of motion.

A generalised linear test was run on R (glmer). The results shows that affordability of motion has a significant effect on objects with depth extension $p = 0.003$ and follows a similar pattern as the one displayed by speakers in the Khasi experiment, with only Affordability showing significant effects on NAM production. Extension and the interaction between extension and affordability shows no significant effect on NAM production.

A graphical representation of the glmer result is presented below:

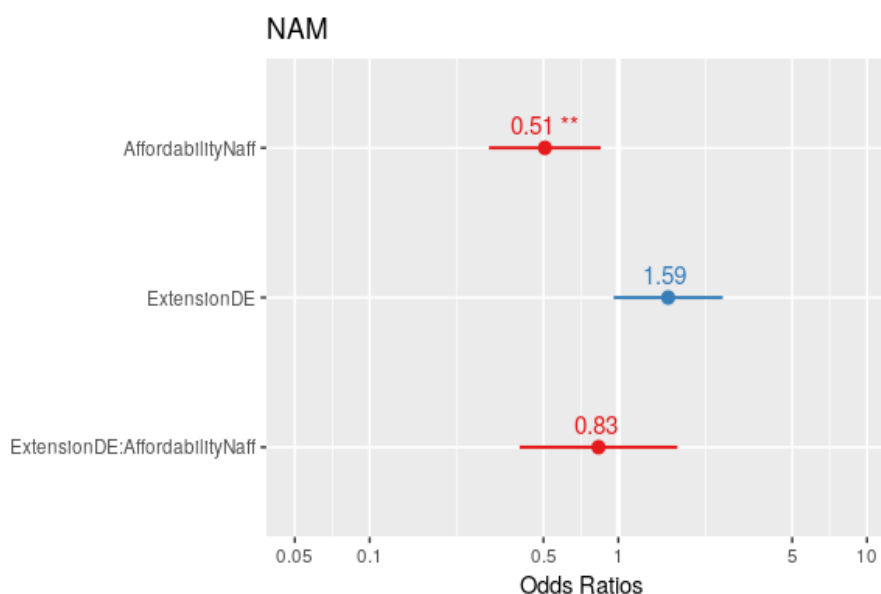


Figure 5.7: Significance levels of affordability, extension and their interaction in English (grp2)

The image above tells us that in the presence of an object which affords motion, the odds ratio of the sample population using NAM expressions is significantly high. This however, does not hold true both for objects that extend across vs into depth. Neither does it hold true for the interaction of depth and afford (*enactive motion*), in this sample population. The post-hoc analysis of the test of the interaction between affordability and extension returned a power of ‘47%’ (Likelihood ratio test, using powerSim from package simr on R). This power is not adequate to fail to reject the null hypothesis. The effect size (Cohen’s D) between the effect size between the conditions DE+Aff and AE+Aff was very small (0.213). One of the factors could be due to small sample size. The recommended sample size for an 90% power with (effect size is) 526 participants. This number of participants is difficult to obtain and the small sample size could be a reason for the insignificant result.

In terms of images, we have the following distribution of motion verbs appearing in the description of the extended objects:

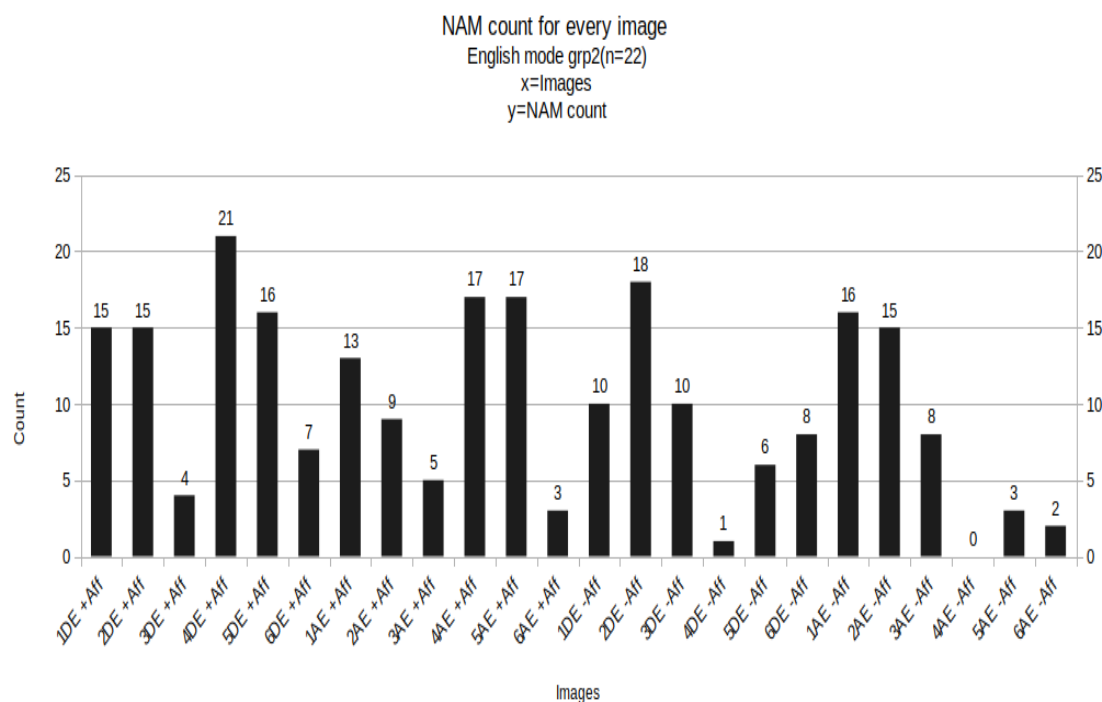


Figure 5.8: Number of NAM used for every image in English (grp.2)

The differences between each stimuli was not taken into account because there was not enough exposure to the same stimuli, and would it require a bigger sample size to take their effects as random variables into account. There is a very similar distribution of NAM expressions across images, when compared to the Khasi data. This reaffirms the need to look at physical properties and configurations of objects. In addition, these results could be, as stated above, due to certain cultural differences.

5.2.4 Discussion

Participants behaved similarly in their bilingual modes regardless of whether or not they were exposed to the experiment previously. The affordability of human motion on objects made a significant difference regardless of whether or not the objects extended across the image or into the image. The verb repertoire in the two groups is very similar, excepting that the group that performed in a Khasi monolingual mode did not use the verb *run* as often as the group that did

not. Both populations have relatively high number of NAM for images with pipes that extend away into depth, like the Khasi data and as reported by Blomberg and Stosic et.al (Blomberg, 2014; Stosic et.al., 2015) and again, my hypothesis is that depth perception might have a role to play in the use of NAM expressions.

5.2.5 English monolingual mode verb distribution in groups 1 and 2

Given that the statistical result of the two groups point in the same direction as the Khasi results, we now compare their repertoires across word classes. This includes their choices of verbs and other expressions as expressed in the NAM descriptions.

Motion	Manner	Path	Direction	Cause	Path+Direction	Other	Total
1	4	5	2	1	1	5	19
move	walk	enter	come	lead	pass by	connect	
	run	exit				leave	
	turn	pass				reach	
	seep	towards*				join	
		across*				link	

Table 5.3: English (grp1) verb repertoire (*through and across are used on their own without verbs)

Motion	Manner	Path	Direction	Cause	Path+Direction	Other	Total
1	4	5	2	1	1	6	19
<i>move</i>	<i>run</i>	<i>enter</i>	<i>come</i>	<i>lead</i>	<i>pass by</i>	<i>connect</i>	
	<i>walk</i>	<i>cross</i>	<i>go</i>			<i>attach</i>	
	<i>turn</i>	<i>pass</i>				<i>join</i>	
	<i>open</i>	<i>through</i> *				<i>joining-joining</i>	
		<i>across</i> *				<i>link</i>	
						<i>let</i>	

Table 5.4: English (grp2) verb repertoire (*through and across are used on their own without verbs)

Both sample populations used similar kinds of verbs. Compared to their Khasi mode, participants used very few path verbs and no path+manner conflating verbs at all. However, the verb *walk* was borrowed and used when describing the path of roads, in both sample populations. While *exit* and *enter* were used to describe objects changing boundaries, they were used

very infrequently. *Exit* was used twice throughout in the first group and once in the second group and *enter* was used once in the first group and five times in the second group. Given that these verbs were amongst the most frequently used verbs in Khasi and they are available in English, the rarity of their usage in this mode could be because of several reasons. One of the reasons, if we were to use an L1, L2 analysis, would point in the direction of semantic load which these speakers don't have competence over. However, they do use the path-verb *pass*, as one of their most frequently used verbs. The verb *lead* as in Khasi and Swedish (Blomberg, 2014) was used only for objects that afford human motion. Interestingly, in this data, one of the participants used the verb *join* as a reduplicated form. Reduplication is a very productive strategy particularly for adverbs and was shown very clearly in the Khasi data to be used to describe manner. However, in the case of this use in English *joining-joining with each other* to describe electric wires, there seems to be a mapping of continuity, the closest one from the Khasi *ter-ter* 'neatly, in a sequence without ending' (Wahlang and Koshy, 2018). In conversation with other IE speakers, I repeated the sentence and asked them if it made sense to them, to which they responded in the positive. Given that reduplication is a pan-South Asia phenomenon, what could be happening here is simply an instantiation of Indian English. We will look into the descriptions in which these words were used in a more detailed manner in this chapter.

Verb	Category	Count
<i>go</i>	deitic	70
<i>pass</i>	path	44
<i>connect</i>	other	34
<i>lead</i>	cause	32
<i>come</i>	deictic	30

Table 5.5: English (grp1): Most used verbs

Verb	Category	Count
<i>go</i>	deictic	59
<i>lead</i>	cause	56
<i>pass</i>	path	27
<i>run</i>	manner	26
<i>connect</i>	other	20

Table 5.6: English (grp2): Most used verbs

Pass, *go* and *lead* were amongst the most frequently used verbs in both groups. The equivalent of *pass* is not available in Khasi but *go* and *lead* are. The second group also used *run*

frequently. The first group used the directional *come* and *connect* very frequently. Both these groups used all these verbs but the higher frequency of *run* could be because the second group was not exposed to the experiment the way the first group was, given that the fluency levels of both the groups was on average, the same. *Go*+satellite is the most common way of describing these objects using NAM, as seen in Rojo and Velenzuela's English native speaker participants (Rojo and Velenzuela, 2003).

The kinds of satellites used by the participants are listed in the following tables:

	Satellite	Category
1	<i>to</i>	Preposition
2	<i>from</i>	Preposition
3	<i>across</i>	Preposition
4	<i>in</i>	Preposition
5	<i>out</i>	Preposition
6	<i>into</i>	Preposition
7	<i>towards</i>	Preposition
8	<i>till</i>	Preposition
9	<i>under</i>	Preposition
10	<i>inside</i>	Preposition
11	<i>outside</i>	Preposition
12	<i>between</i>	Preposition
13	<i>through</i>	Preposition
14	<i>down</i>	Adverb
15	<i>directly</i>	Adverb
16	<i>straight</i>	Adverb/Adjective
17	<i>forward</i>	Adverb
18	<i>continuously</i>	Adverb
19	<i>vertically</i>	Adverb
20	<i>along</i>	Adverb
21	<i>deep</i>	Adverb
22	<i>all the way</i>	Adverbial phrase (intensifier)
23	<i>straight up</i>	Adverbial phrase (intensifier)
24	<i>from x to y</i>	Prepositional phrase

Table 5.7: Satellites used in English (grp1)

	Satellite	Category
1	<i>to</i>	Preposition
2	<i>from</i>	Preposition
3	<i>across</i>	Preposition
4	<i>in</i>	Preposition
5	<i>out</i>	Preposition
6	<i>into</i>	Preposition
7	<i>in</i>	Preposition
8	<i>outside</i>	Preposition
9	<i>towards</i>	Preposition
10	<i>forward</i>	Preposition
11	<i>till</i>	Preposition
12	<i>under</i>	Preposition
13	<i>through</i>	Preposition
14	<i>between</i>	Preposition
15	<i>past</i>	Preposition
15	<i>directly</i>	Adverb
16	<i>vertically</i>	Adverb
17	<i>straight</i>	Adverb/Adjective
18	<i>distant</i>	Adjective
19	<i>right into</i>	Prepositional phrase (intensifier)
20	<i>from x to y</i>	Prepositional phrase

Table 5.8: Satellites used in English (grp2)

The two populations seem to use more or less the same classes of words to give details about the path and direction.

5.3 Linguistic analysis: NAM as represented in English descriptions

The tables of verbs above give us an overview of the English verb repertoire that the participants have for describing the stimuli images. They seem to use more or less the same number of verbs, which are relatively less compared to the Khasi repertoire. The most frequently used verbs are bleached manner verbs *go* and *lead*. Direction and location are expressed through prepositions. In addition, path and direction are also expressed using adverbs or reduplication. The qualitative linguistic analysis will include data from both sample populations, given that the repertoires of verbs are similar.

In terms of the preference for the use of relative clauses, the English data has relatively less numbers of relative clauses, with both groups using relative clauses 47 - 49% of the time. This shows that participants are able to use simple sentences more than they do in Khasi.

5.3.1 Description of object properties

Noun modifiers long and straight are used to describe the object's extension. When the objects are individuated like rocks or sticks in fences, they are described using words like *series* and *centipede*, as in the example below:

1. There is a *centipede* line of rocks running across and on the other side of rocks there is running water.

In addition, adjectives like *long* and *straight* are used to describe the object.

Cultural effects from Meghalaya also show up in the way the Subject Nouns are described, using adjectives like “metal” or “artificial” to describe pipes and bridges. This stems from the fact that cane, wood and tree roots are used for building bridges and bamboos are still commonly used in many parts of the hills as pipes. Take the following example for instance:

2. An *artificial* bridge with a pipe coming through it.

At times the descriptions were made in a single sentence as instructed but it doesn't describe the object of extension, focusing on other aspects of the image instead, for example:

3. A mildly big house with a private road completely surrounded by trees/forest. (AE+Aff2)
4. A countryside with a human made barricades, military style, wooden barricade. (AE-Aff6)

5.3.2 FoRs

The kinds of FoRs used by participants include object-centered and view-point centered. Geo-centric FoRs were not used, most likely because of the stimuli.

5. There is one house and one road and outside, plants. (DE+AFF2)
6. I see a one storey house on top of a hill with pine trees around about it and at the right front of the house there are two trees. (AE+Aff2)

5.3.3 Motion

The ways in which participants use different types of verbs and other “satellites” (prepositions and adverbs) will be explored and compared to the ones used in their Khasi modes and to data from other studies.

To begin with, in the English mode, participants used the motion verb *move* to describe extension, a motion verb that does not conflate either path or manner, as attested in the example below.

7. *There is tunnel through which a water pipe **moves** inside and there are rocks inside.* (DE-Aff1)

While the equivalent to *move*, *k^{hi}i?* is available in Khasi, it does not share the concept of translocation with the English verb. The use of this verb is fascinating because it is not bleached of its motion concept unlike *go*. While *go* is a deictic verb, it is mostly used in its bleached form, like *le^yt* ‘go’ in Khasi and *gå* in Blomberg’s analysis of Swedish (Blomberg, 2014).

8. *This is a small house and there is a road **going** to this house.* (AE+Aff1)

5.3.4 Manner

NAM expressions involve different kinds of manner conflating verbs, including the often used verb *run*. In 10, the verb *runs* is used in a bleached form, where it does not refer to manner.

9. *There is a fence that **runs** across the field.* (DE-Aff6)

10. *A road **running out from** the end of the tunnel with hills on the other side.* (DE+Aff4)

The use of the verb *run* in its *imperfective* form is curious, because Khasi marks for perfective, durative and progressive, amongst other aspectual markers (Jyrwa, 1993). However, unlike English, Khasi only marks for past (optional) and future tenses, leaving the present to be understood either contextually or with the use of aspectual markers. This could be one of the reasons for the use of the progressive or imperfective *-ing*, in the English data. This could be an effect of concept transference through language contact, where the English spoken here is a different kind on its own and a product of the interaction of Khasi and English. This explanation has been attempted for IE used in other parts of India as well (Sharma, 2009).

In example 6, we also find the preposition *out from* which occurs frequently in descriptions of images involving boundary crossing, along with the preposition *out of*. When a bleached

motion verb or a manner verb is used, the change in boundary is expressed through prepositions, as exemplified in 10. We will look into prepositions in more detail in the section on region.

An analysis of the reduplication of the verb *join* which was categorised as “Other” in the table of verbs shows that in the data.

11. *There are several logs lying there, electric wires, one **joining-joining** with each other.*
(DE-Aff3)

Reduplication, as we have seen in the Khasi data is a word formation process which Khasi uses extensively. It is also available in many other South Asian languages and is one of the features that is used to argue for a Linguistic Area status of South Asia (Abbi, 1992). While the reduplication structures that were used in Khasi mode are more iconic in nature, the case of *joining-joining* is not. In addition this does not strictly follow the reduplication rule that Khasi has. In Khasi the reduplication of a verb occurs with the addition of repetitive marker verb-*fi*-echo (Nagaraja, 1985), for example *run-fi-run* “enter-REP-enter (keep entering)”; or with the *ja*, the commitative marker, for example, *ja-ja’d-ja-ja’d* “COM-walk COM-walk (walk while doing something else)”. Reduplication without using these markers is generally used with adverbs, as seen in the Khasi examples. However, reduplication as seen in this example is a regular occurrence in Indian English (Mehrotra, 1997). The verb *join* by itself fits more in a category of diminished motion but when used as a reduplicated verb, it also refers to a continuity of the action of *join*, as in they keep joining with each other, from one electric pole to another. In that sense this verb conflates motion with manner. Regarding where this word comes from, there are two possible explanations. The first one is a conceptual transfer from Khasi to English, where the word *join* is actually transferred from a noun-modifier position, wires that continue to join. Since Khasi has a propensity to modify nouns through the use of relative clauses, this is a grammatical conceptual transfer from Khasi to English. The second explanation is to look at this as a stabilised conversion of concepts through language contact, from Khasi or other languages in South Asia, and forms part of IE.

5.3.5 Region, Path and Direction

Due to the interconnection between Path and Region, especially in the case of region-change, we will look at the two together. NAM expressions involve different kinds of path conflating verbs.

Region is expressed through the use of prepositions and adverbs. Region change is expressed through Path-conflating verbs and prepositions.

12. *Here is a water pipe line **coming out** of nowhere from the mountains.* (AE-Aff1)
13. *There is a fence that is build on the sand that **goes into** the sea.* (AE-Aff5)
14. *There is a sea beside it there is a fence which is **going from** the land to the water.* (AE-Aff5)
15. *There is a road which is **going right into** the house.* (AE+Aff2)
16. *This is a road carved on a hillside **coming out** from a tunnel.* (AE+Aff4)

Interestingly, some of the images without an obvious change of region, i.e. without tunnels were described using prepositions that indicate region change. These include trails and roads that go to/from a house/cottage.

17. *In an isolated area there is one hut, a path that **goes straight into** the hut.* (AE+Aff1)
18. *It is a toilet¹ having two windows and one door with a path **leading into** it.* (AE+Aff1)

Path conflating verbs are also found to express region change. The ones used by participants include *enter*, *exit*, *start*, *pass*, *cross* and *end*. These verbs are often followed by prepositions and adverbs. These verbs primarily express a change of regions and often followed by *into*, *inside*, *under*, *through* and *across*.

19. *There is a water pipe **entering** into the tunnel.* (AE-Aff2)
20. *There is one pipe, **crossing through**..* (DE-Aff1)
21. *A mountain road[...] **exiting** a tunnel through the mountain.* (DE+Aff4)
22. *This wire **passes** from one electric post to another electric post.* (AE-Aff3)
23. *It appears to be a small lane **passing** under the tunnel.* (AE+Aff3)

The uses of the verb *pass* in 21) and 22) differ depending on the prepositions that accompany them. In 14) the use of *pass* is of a consecutive nature, where the figure crosses several landmarks of the same kind. In 15) on the other hand, the object that the figure encounters and the prepositions under, through informs us that the figure: region relationship is contiguous to a point and changes after.

¹Two of the participants identified the object in AE+Aff1 and DE+Aff1 as an outhouse

Participants use adverbs *straight*, *directly*, *vertically*, *along* and *forward* to describe path and region. Straight is also used as an adjective to describe the object itself. These adverbs are also attested in Khasi, although in a much richer variation, which as listed in the Khasi analysis include, *bejt - bejt* ‘straight–straight (very straight)’, *stət* ‘quickly’, *siak* ‘straight and precise’ and *ter-ter* ‘neatly in a sequence without ending’. The only instance of reduplication in this data is the use of the verb *join*, to form *joining-joining*.

24. *There is a water pipe which enter **straight direct into** this tunnel.* (DE-Aff2)
25. *A small wooden cabin that has a path that comes **directly** to the door, **in front** of the door.*
(AE+Aff1)
26. *There is a simple fence running **vertically** to the sea.* (DE-Aff5)
27. *This picture has a grassland, on the grassland there are electric poles running **along**.*
(AE-Aff3)

In the images containing a trail/road going to a house, participants depicted the one-to-one relationship between the house and the road through the use of the prepositions *into* or adverbs *directly* and *straight*. This was also documented in Khasi with the use of *beyt* ‘straight’ and other adverbs. A potential reason for why this is marked so clearly is the fact that houses and roads are not connected this way in India. However, it brought up an interesting aspect of path information that was found in Khasi as well, where it tells us that the figure does not change end point landmark, or have multiple end point landmarks. This is not just information about direction and path but rather of the one-path one end goal relationship between the Figure and the Landmark.

5.3.6 Point of view and the uses of deitic verbs and entry/exit verbs

Deictic verbs *come* and *go* are amongst the most frequently used verbs in the data. While *come* is used with its deictic concept, *go* is not and it is hard to make an analysis of it without looking at the whole sentence. We will begin by looking at the conditions in which *come* is used in the two sample populations. Amongst the population that *Come* is used 27 times when objects have boundary crossing and only 3 times when there is no boundary. When it comes to Landmarks, *Come* is used 11 times when the landmark is at the beginning of the image and only four times when the landmark is at the end of the image. This points at an effect of view-point in the use of the deictic verb *come*.

5.3.7 Non-actual path

As pointed out by Blomberg (2014), dynamicity or continuity is also expressed without the use of verbs and are accounted for through information about Path.

28. Ett rör ut genom en tunnel.

DET.INDF pipe out through DET.INDF tunnel

‘A pipe out through a tunnel’. (Blomberg, 2014:203)

Similarly in Khasi we seen have instances of non-actual path constructions. In the English mode we find these descriptions as well, as exemplified in the following:

29. *A rough bridge **across** a pond or a river, the bridge is made of stone.* (DE+Aff6)

30. *A way **towards** a small cabin with one chimney and a window and a door.* (DE+Aff1)

In addition to non-actual path, we also have instances of descriptions like the following:

31. *There is a curved bridge which curve in the middle which **joins from** the other end of the cliff **to** the other end of another cliff.* (AE+Aff5)

32. *There is some sort of boundary made up of stumps of wood connected by a rope that **go all the way upto** the sea.* (DE-Aff5)

While the verbs themselves encode some action, the use of the prepositional phrases *from...to*, and the intensifier adverbial phrase *all the way upto* give a sense of motion.

5.4 Discussion

This chapter explored NAM through experiments in Khasi - English bilinguals. The results from the English mode data points 1) the effect of Affordability of motion on the production of NAM expressions and 2) Khasi - English multilinguals have different verb repertoires in their descriptions of the features Path and Region change, in their different language modes.

Linguistically, when in a monolingual Khasi mode, the participants use a combination of Path, Manner, Path and Manner, Direction verbs to describe objects in NAM, expressing Non-actual path, non-actual manner and non-actual movement. In their English modes there was a reduced encoding of motion. There is no evidence of manner descriptions or non-actual movement either.

The significant difference in the use of entry and exit verbs between the two language modes is an obvious effect of the languages in use.

Verb	Translation	Category	No.of times used
<i>ja:ɟd</i>	walk	Manner	149
<i>mi?</i>	exit	Path	49
<i>ruN</i>	enter	Path	40
<i>jalam</i>	lead	Cause	22

(a) Khasi: Most used verbs (Wahlang and Koshy 2018: 47)

Verb	Category	No. of times used
<i>go</i>	deictic	70
<i>pass</i>	path	44
<i>connect</i>	other	34
<i>lead</i>	cause	32
<i>come</i>	deictic	30

(b) English (grp1): Most used verbs

Verb	Category	No. of times used
<i>go</i>	deictic	59
<i>lead</i>	cause	56
<i>pass</i>	path	27
<i>run</i>	manner	26
<i>connect</i>	other	20

(c) English (grp2): Most used verbs

Table 5.9: Comparison of frequently used verbs between Khasi, English (grp1) and English (grp2)

The difference of preference in the encoding a change from one region to another, an encoding the changes in boundary through the use of path verbs in Khasi and prepositions in English consistently within both sample populations could arise due to several reasons. The first could be that English being a predominantly Satellite phrased language affected the use of these verbs in these participants. Given that the equivalent verbs are also available in Khasi, this is a likely cause of this difference. The second could be that exit-entry verbs are harder to use because they contain both boundary change information and path and therefore the participants chose to whatever worked best for them, in this case the use of bleached manner verbs and path expressed through satellites instead. These might not be mutually exclusive either. However, both groups had the verbs *pass* and *cross* as one of the most frequently used verbs in their verb repertoire, which is a path conflating verb.

In terms of bilingual repertoires, there is a level of conceptual transference; however it is unclear if this is at the level of the individual speakers or if it is a stabilised convergence of languages, in this case it could be Khasi or a mixed convergence of South Asian grammatical structures and English, leading to a separate structure like reduplication in Indian English. The other possible player in the use of reduplicated forms could come from genetic features of Monkhmer languages. Currently, there are no available studies of NAM in Monkhmer languages and future work would include a bigger number of languages from this family.

The overall patterns of use of linguistic resources, both in terms of the most frequently used verbs and the use of other spatial expressions in the English and Khasi modes point to separate systems of conceptual structures. However, we also find that there are points at which these converge, as modeled in the MHM. However, what is unclear is whether the shared system is a product of individual restructuring or a shared restructuring of concepts across speakers of IE, or a combination of both. If we think of IE as an emergent language that shares the different features that make South Asia a linguistic area, perhaps we can find these elements in IE. From there, we can also build an understanding of IE which is then a product of the interaction of English and the different languages/language families in India. That would make reduplication and the use of imperfectives something like a “core” features of IE. This gives us room to understand the use of English in India as a separate phenomenon instead of comparing Indian English speakers to native speakers of English.

Chapter 6

Conclusion

The journey of this thesis started with questions about why languages use motion verbs to talk about the property of extension in static objects. Blomberg's work led him to propose enactive motion as a primary motivation of Non-Actual motion and as of now stands as the most recent and updated theoretical and methodological framework available in the field of NAM studies. Testing his hypothesis and checking if his results can be replicated in a different sample population was the first step taken. To this end, the experiment he performed was replicated in a Khasi - English multilingual sample population. The results from the study then prompted a closer look at the population itself and led to explorations of multilingualism through NAM. In concluding this chapter, I will talk about the results but also of the gaps that this thesis was not able to plug, the dynamics of Indian language use and what could be explored in the future. These conclusions come from the experimental, behavioural results and the different ways in which the sample populations talked about Non-Actual motion.

6.1 Affordability as a potential motivator of NAM

The hypothesis that the thesis started out with the aim of investigating the role of enactive motion as a primary motivator of NAM experience and descriptions. In addition, visual scanning and metaphorical thinking are proposed to be the other two motivators of NAM.

The results as reported in Chapter 3, point towards the role of the Affordability of motion on objects as being a motivator in our use of NAM expressions. The next question that arose was whether this behavioural result would differ if participants repeated the experiment in their English mode. The experimental results in chapter 5 show that the results in the English mode follow the same direction as the results of the Khasi mode, i.e. that the affordance of

motion is the potential motivator in the use of NAM expressions. The results are reminiscent of Stosic et.al's results of the same experiment in French, German, English and Italian (Stosic et. al, 2015). As of now, we can conclude that the affordance of motion seems to be the main motivator for the use of NAM, across these languages. This also applies to performance in different language modes in a multilingual. The experiment needs to be repeated in more languages to check if this is a universal feature of spatial experience. It also requires several more studies to look into the details of where non-linguistic behaviour and language interacts in the case of NAM, since this thesis only looked at an explicitly linguistic behaviour, with speech actively involved in the experimental settings.

The result of enactive motion as a primary motivator of NAM did not hold true for the Khasi - English multilingual population. Enactive motion is experimentally designed through the interaction between depth extension and the affordance of human motion on these objects. This interaction was not found to be significant in the results of the experiments conducted in this thesis. Neither did extension play a significant role in the elicitation of NAM expressions. Part of the reason why extension did not show up as a significant independent variable could be because of the angles at which the objects in the images were rendered, where it is difficult to have objects extending into depth while also depicting their extension. This is an issue that was raised by Stosic's group, when they also tried replicating this NAM study in other languages (Stosic et.al. 2015). In an attempt to close this gap, an eye tracking experiment was performed with a completely different sample population. However, since the thesis's focus is on cognitive linguistics, this experiment is included as a supporting document and a potential exploration in the future (Appendix 3).

6.1.1 Eye-tracking pilot experiment

Previous studies on eye movements showed that audio stimuli containing directions guide eye movements (Spivey et al., 2002). Using a similar design, the experiment looked at the effects of audio stimuli describing extension of different objects' orientation on eye-fixation variance on the X-Y axes on a blank screen. The preliminary results show a difference in the variance of eye-fixations on the X-Y axis, guided by the audio stimuli. The experiment explored the effects of audio-stimuli on eye-movements. Since this experiment does not directly contribute to addressing the main questions posited in the thesis, it has been omitted from the main chapters of the thesis. However, preliminary report is added as an appendix (Appendix 3) to the thesis.

6.1.2 Potential stimuli and cultural effects

There are several other possible reasons for why enactive motion did not show up as a primary motivator of NAM. Blomberg's data showed a conclusive effect of enactive motion across the Swedish, French and Thai population (Blomberg, 2014), with a smaller sample sizes compared to the ones in this thesis, despite the stimuli issue raised above. The reason for the result differences could also lie elsewhere. One of the potential confounding factors could be object features. For instance, the chairs, by themselves are not extended and the extension is given by the arrangement of chairs. Such objects are also listed in Talmy's fictive motion objects (Talmy, 2000a). In this regard, much of the corpus studies have shown that co-extension paths have the highest number of NAM expressions (Ma, 2016; Stosic et al., 2015) and further studies need to look more closely at the way object properties guide our perception of them. I have also proposed that the number of high NAM expressions in the case of objects that do not allow for human motion and that extend into depth, might have to do with our perception of depth, which gives rise to a sense of growing distance between different parts of the objects and our positions as perceivers. The other possible contributors to the differences in the results could also be cultural. For instance, sunbathing is not a common practice in India, making the image of sunbathing chairs a highly unlikely scenario. This could make it hard for participants to describe the objects, since they lay outside their usual ideas of a beach or a lakeside. In fact, with this particular sample population, the beach is not an object they grew up around, given that Meghalaya is in the mountains and does not have any coastlines and neither do the cities they currently live in. While these cultural effects might not have any significant effect, we cannot rule out a potential scenario where the participants are unable to give more information about the visual scene, especially in an experimental setting like this one.

6.2 Language context, multilingualism in NAM descriptions

The language context of participants has been an important, if unresolved issue in this thesis. Partly because of the political outlook on language, India, with the exception of making Hindi the other official language in addition to English, has officially afforded much more room for diverse languages to co-exist. These are students, who like most migrating student populations in India, speak at least two, if not more languages. The number of languages that participants use in everyday varies depending on who and where they are. In addition, I faced difficulties in figuring out what English in the context of this thesis refers to. Many of the bilingual studies involving English and other South Asian languages, treat Indian speakers of English as speakers

who do not have native-English speakers like competence. However, if participants use English everyday, and English in India is recognized as a language in itself and yet differing from region to region, there needs to be more linguistic work on it. In chapter 5 we find evidences of some of the characteristics pointed out by scholars of IE, like the use of *-ing* and reduplication. However, models that account for the multilingual context of India need to be built. Such a model would have to account for language contact, multilingual childhoods and a semblance of something like IE as a product of being spoken in a linguistic area, with shared characteristics and variations as a product of individual language or language families' effects on it. Such studies would also need to reconsider the idea of a native speaker, since such a language context would do away with notions of a particular set of people who know a language best, given that something like IE would likely not have the same features across regions but it would allow for variations, while holding some shared features. This kind of working paradigm would follow Kachru's ideas of the ways in which Englishes around the world are organised (Kachru, 1985).

The kind of cognitive processes that are at play here might be very different from the ones accounted in bilingual models constructed to understand the different aspects of bilingual language learning. Instead of fitting my data into bilingual models, I have instead attempted to borrow the ideas conceptual transference and convergence (Jarvis, 2011; Pavlenko, 2009). For the semantic analysis within a language mode, I have looked at the kind of linguistic resources that the participants have used in their descriptions and looked at how they used them to talk about the spatial semantic categories according to the Holistic Spatial Semantics framework. The analysis of the descriptions show a difference in their verb repertoires. In their Khasi mode, the participants use a combination of Path-conflating verbs, case markers, adverbs to express path and direction. They also express manner and a physical configuration verb *par* 'crawl', which has been categorised as non-actual movement.

In their English mode, participants used a different spatial expressions repertoire compared to their Khasi repertoire. This was checked against a sample population that did not participate in the experiment in the Khasi mode. Both populations showed a similar kind of repertoire. In their English modes, the two sample populations expressed path using Path conflating verbs, prepositions and adverbs. Manner was not expressed to the extent that it was in Khasi, however we find convergence instantiated in the reduplicated form of the verb *join*: *joining-joining* in its reduplicated form, the verb while retaining the concept of connection from one point to another, or one object to another, also gives the figure a sense of continuity.

In both modes participants noted the culturally odd image of a single road to a single door, choosing to sometimes express it as a change of boundary through the use of the preposition *into*. This cultural difference is marked in Khasi as well, through the use of adverbs.

A significant finding in this data is the semantics that the adverb *straight* has, in that it expresses a one-to-one relationship between the end point of the figure and the landmark, or a singular goal of a figure.

Non-actual-movement, as proposed by Blomberg accounts for the use of *par* ‘crawl’ in Khasi. However, further cross-linguistic studies will give us a clearer idea what kinds of manners are allowed to be encoded in NAM expressions.

Finally, the difference in the most frequently used verbs between the two language modes, shows a difference in the way the language modes affect what the participants chose to encode in the verb, in cases where there are explicit boundary change - pipes and roads exiting or entering a tunnel. Despite their use of *pass* as a frequent verb to encode path, they did not use *enter* or *exit* as often as they did in Khasi. In fact, *enter/exit* were amongst the most frequently used verbs in Khasi. In English they featured as some of the most rarely used verbs. What exactly causes this difference is hard to say, but it is clear that the language mode affects how extension is described, despite the fact that the languages investigated in this thesis offering the same resources. Participants were led to express changes in boundaries differently depending on which language they spoke, choosing to encode this information habitually differently, despite the availability of the same resources in both languages. This difference could be taken to point towards Slobin’s ‘*Thinking for speaking*’.

Bibliography

- [1] Athanasopoulos, P. (2015). Conceptual representation in bilinguals: the role of language specificity and conceptual change. In J. W. Schwieter, (Ed.). *The Cambridge handbook of bilingual processing* (pp. 275-292). Cambridge: Cambridge University Press.
- [2] Athanasopoulos, P. and Bylund, E. (2013). Does grammatical aspect affect motion event cognition? A cross-linguistic comparison of English and Swedish speakers. *Cognitive Science*, 37: 286-309
- [3] Bars, E. (1973). *Khasi –English dictionary*. Shillong: Don Bosco.
- [4] Bates, D.M. , Maechler, M. , & Bolker, B. (2012). *lme4: Linear mixed - effects models using S4 classes*. R package version 0.999999 - 0.
- [5] Baayen, R.H. (2008). *Analyzing Linguistic Data: A Practical Introduction to Statistics Using R*. Cambridge: Cambridge University Press.
- [6] Beavers, J., Levin, Beth. and Tham, S, W. (2010). The typology of motion events revisited. *J. Linguistics*. 46:331-377.
- [7] Berkeley, George. (1709). *An Essay Towards a New Theory of Vision* (2 ed.). Dublin: Jeremy Pepyat. Retrieved 12 July 2014. via Google Books
- [8] Brown, R W and Lennerberg, E H. (1954). A study in language and Cognition. *J. Abnormal and Social Psychology*, 49: 454 - 462.
- [9] Blomberg J. (2014). *Motion in Language and Experience – actual and non-actual motion*, Lund: Travaux the institute the linguistique de Lund 53.
- [10] Blomberg, J. and Zlatev, J. (2014). Actual and non-actual motion: Why experientialist semantics needs phenomenology (and vice versa). *Phenomenology and the Cognitive Sciences*, 13(3), 395-418.

- [11] Bowerman, M. 1996. Learning how to structure space for language: A cross-linguistic perspective. In P. Bloom, M. A. Peterson, L. Nadel, & M. F. Garrett (Eds.), *Language and space* (pp. 385-436). Cambridge, MA: MIT Press
- [12] Brandt, L. (2009). Subjectivity in the act of representing: The case for subjective motion and change. *Phenomenology and the Cognitive Sciences*, 8(4): 573-601.
- [13] Brown, R. (1967). *Wilhelm Von Humboldt's Conception of Linguistic relativity*. The Hague: Mouton & Co
- [14] Brown, A. (2015). Universal development and L1-L2 convergence in bilingual construal of manner in speech and gesture in Mandarin, Japanese and English. *The modern language journal*, 99: 66-82.
- [15] Cacciari, C., Bologini, N., Senna, I., Pellicciari, M.C., Miniussi, C. and Papagno, C. (2011). Literal, fictive and metaphorical motion sentences preserve the motion component of the verb: a TMS study. *Brain and Language*, 119: 149 - 157.
- [16] Carroll, John, B. (1956). Introduction. In John, B Carroll (Ed.), *Language, Thought and Reality: Selected writings of Benjamin Lee Whorf* (pp. 1-34). Cambridge: MIT Press.
- [17] Census of India.(2011). *Language*. [Data file] Retrieved from http://censusindia.gov.in/2011Census/C-16_25062018_NEW.pdf
- [18] Choi, S. and Bowerman, M. (1991). Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. *Cognition*, 41: 83-121.
- [19] Choi, S., McDonough, L., Bowerman, M., & Mandler, J. M. (1999). Early sensitivity to language-specific spatial categories in English and Korean. *Cognitive Development*, 14: 241-268.
- [20] Chomsky, Noam (1959). A Review of B. F. Skinner's Verbal Behavior", *Language*, 35 (1): 26–58, doi:10.2307/411334
- [21] Cook,V., Bassetti, B., Kasai, C, Sasaki, M. and Takahashi, J.A. (2006). Do bilinguals have different concepts? The case of shape and material in Japanese L2 users of English. *International Journal of Bilingualism*, 10: 137-152

- [22] De Groot, AM.B. (1992) Bilingual lexical representation: A closer look at conceptual representations. In R. Frost and L. Katz (Eds.), *Orthography, Phonology, Morphology and Meaning* (pp. 389-412). Amsterdam: Elsevier.
- [23] De Groot, AM.B. (1993) Word-type effects in bilingual processing tasks: Support for a mixed-representational system. In R. Schreuder and B. Weltens (Eds.), *The Bilingual Lexicon* (pp. 27-51). Amsterdam: John Benjamins.
- [24] Diessel, H. (1999). Demonstratives: Form, Function, and Grammaticalization. *Typological Studies in Language* 42, Amsterdam: John Benjamins.
- [25] Diffloth, Gérard. (1979). Expressive phonology and prosaic phonology in Mon-Khmer. In Thongkum, T.L, Panupong, V, Kullavanijava, P. and Kalaya Tingsabadh M.R (Eds.), *Studies in Tai and Mon-Khmer phonetics and phonology in honour of Eugénie J.A. Henderson* (pp. 49-59). Chulalongkorn University Press.
- [26] Diffloth, Gérard. (2005). The contribution of linguistic palaeontology and Austro-Asiatic. In Laurent Sagart, Roger Blench and Alicia Sanchez-Mazas (Eds.), *The peopling of East Asia: putting together archaeology, linguistics and genetics* (pp. 77–80). London: Routledge Curzon
- [27] Ellas, H. (1972). *Ki khanatang u mynbarim*. Shillong: Don Bosco Press.
- [28] Ferguson, Charles A. and John D. Gumperz. (1960). Linguistic diversity in South Asia. *International Journal of American Linguistics*, 26(3): 7:-13.
- [29] Filipovic, L. (2011). Speaking and rememnering in one or two languages: bilingual vs monolingual lexicalisation and memory for motion events. *International Journal of Bilingualism*, 15(4): 466 -485.
- [30] Gennari, S. P., Sloman, S. A., Malt, B. C. and Fitch, W. T. (2002). Motion events in language and cognition. *Cognition*, 83: 49–79.
- [31] Ghosh, Amitav. (2010). *Countdown*. UK: Penguin.
- [32] Grosjean, F. 1999. *The bilingual's language modes. One mind two languages: Bilingual language processing*. Oxford: Blackwell.
- [33] Jackendoff, Ray. (1983). *Semantics and cognition*. Cambridge: MIT Press.

- [34] Jarvis, S. and Pavlenko, A. (2008). *Crosslinguistic Influence in Language and Cognition*. New York: Routledge
- [35] Jarvis, S. (2011). Conceptual transfer: Crosslinguistic effects in Categorisation and Construal. *Bilingualism: Language and Cognition*, 14(1): 1-8.
- [36] Jiménez Martínez-Losa. (2007). Towards a typology of fictive motion events: review of existing proposals and presentation of new perspectives. *Interlingüística*, 17: 562 – 269.
- [37] Kachru, B. B. (1975). Lexical innovations in South Asian English. *International Journal of the Sociology of Language*, 4: 55–74.
- [38] Kachru, B.B. (1982). *The Other Tongue: English Across Cultures*. University of Illinois Press, Urbana.
- [39] Kachru, B. B. (1985). Standards, codification and sociolinguistic realism: the English language in the outer circle. In Randolph Quirk and H. G. Widdowson (Eds.), *English in the world: teaching and learning the language and literatures* (pp. 11–30). Cambridge, UK: Cambridge University Press.
- [40] Kharkongnor, Iarington. (1968). *Ka Dienshonhi*, Shillong: Ri Khasi Press.
- [41] Koshy, A and Wahlang, M, G, T. (2011). Mnar morpho-syntax: A preliminary study. *Indian Linguistics*, 72: 153 – 171.
- [42] Kroll, J. and Stewart, E. (1994). Category interference in translation and picture naming: Evidence for asymmetric connections between bilingual memory representations. *Journal of Memory and Language* 33: 149-174
- [43] Langacker, Ronald. W. (1990). *Concept, Image, and Symbol: The Cognitive Basis of Grammar*. Berlin and New York: Mouton de Gruyter.
- [44] Lakoff, George and Johnson, Mark. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic books
- [45] Lakoff, George and Johnson, Mark. (2003). *Metaphors we live by*. Chicago: University of Chicago Press.
- [46] Lessing, Dorris. 2003. *This was the Old Chief's Country: Collected African stories Volume one*. UK: Flamingo.

- [47] Levinson, Stephen. C. (1996). Frames of reference and Molyneux's question: Cross-linguistic evidence. In P. Bloom, M. Peterson, L. Nadel and M. Garrett (Eds.), *Language and Space* (pp. 109-169). Cambridge: MIT Press.
- [48] Levinson, S. C. (2003). *Space in Language and Cognition: Explorations in Cognitive Diversity*. Cambridge: Cambridge University Press.
- [49] Levinson, S. C. and Wilkins, D. P. (2006). *Grammars of Space: Explorations in Cognitive Diversity*. Cambridge: Cambridge University Press.
- [50] Lucy, John. (1997a). Linguistic relativity. *Annual Review of Anthropology* ,26: 291–312. Palo Alto: Annual Reviews Inc.
- [51] Lucy, John. (2011). Language and Cognition: The view from Anthropology. In V Cook and B. Basetti (Eds.), *Language and Bilingual Cognition* (pp. 43-68). Abingdon: Routledge, Taylor and Francis group.
- [52] Ma, S. (2016). *Fictive motion in Chinese*. University of Auckland research repository, ResearchSpace: Auckland.
- [53] Mallikarjun, B. (2010). Patterns of Indian multilingualism. *Language in India*, 10: 1 -18.
- [54] Malt, B., Sloman, S., Gennari, S., Shi, M. and Wang, Y. (1999). Knowing versus naming: Similarity and the linguistic categorization of artifacts. *Journal of Memory and Language*, 40: 230-262.
- [55] Matsumoto, Y. (1996). Subjective motion and English and Japanese verbs. *Cognitive Linguistics*, 7: 183-226.
- [56] Matlock, T. (2004). Fictive motion as cognitive simulation. *Memory and Cognition*, 32: 1389 - 1400.
- [57] Matlock, T. (2010). Abstract motion is no longer abstract. *Language & Cognition* 2(2): 243-260.
- [58] Montero-Melis, G., Jaeger, T. F., & Bylund, E. 2016. Thinking is modulated by recent linguistic experience: Second language priming affects perceived event similarity. *Language Learning*, 66(3): 636– 665.
- [59] Moulton, William G. (1969). The nature and history of linguistics. In Archibald A. Hill (Ed.), *Linguistics today* (pp. 3-17). New York: Basic Books.

- [60] Nagaraja, K. S. (1985). *Khasi: A descriptive analysis*. Pune: Deccan College.
- [61] Papafragou, A., Massey, C. and Gleitman, L. (2002). Shake, rattle ‘n’ roll: the representation of motion in language and cognition. *Cognition*, 84: 189 - 219.
- [62] Pavlenko, Aneta. (1999). New approaches to concepts in Bilingual memory. *Bilingualism: Language and Cognition*, 2(3): 209 - 230.
- [63] Pavlenko, A. (2014). *The Bilingual Mind and What it Tells us about Language and Thought*. Cambridge: Cambridge University Press.
- [64] Pavlenko, Aneta. (2016). Whorf’s lost argument. *Language learning*. 66(3): 581-601.
- [65] Peirce, JW. (2007). PsychoPy - Psychophysics software in Python. *J Neurosci Methods*, 162(1-2): 8-13
- [66] Pingali, Sailaja. (2012). Indian English: Features and Sociolinguistic aspects. *Language and Linguistics Compass*, 6(6): 359 - 370.
- [67] Ponty, M. (1962). *Phenomenology of perception*. London: Routledge Classics.
- [68] Quine, Willard Van Orman. (1960). *Word and Object*. New York: MIT Press.
- [69] Rabel, Lily . (1961). Khasi, a Language of Assam. Baton Rouge: Louisiana State University Press. Rabel, L. 1977. Gender in Khasi nouns. *Mon-Khmer Studies (VI)*: 247 – 272.
- [70] Rajagopalan, Kanavillil. (1997). Linguistics and the myth of nativity: Comments on the controversy over ‘new/non-native Englishes’. *Journal of Pragmatics* 27: 225 - 231.
- [71] Rojo, Ana and Velenzuela, Javier. (2003). Fictive motion in English and Spanish. *International journal of English studies*, 3(2): 125 – 151.
- [72] Rosch, Eleanor. (1999). Reclaiming cognition: The primacy of action, intention and emotion. *The Journal of Consciousness Studies*, 6(11-12): 61-77
- [73] R Core Team. (2012). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria.
- [74] Sapir, E. (1921). *Language: An Introduction to the Study of Speech*. New York: Harcourt Brace

- [75] Sapir, Edward. (1929). The status of Linguistics as a Science. *Language*, 4(5) :207 - 214.
- [76] Schultze-Berndt, E. (2006). Sketch of a Jaminjung grammar of space. In S. C. Levinson and D. P. Wilkins (Eds.), *Grammars of space: explorations in cognitive diversity*, (pp. 63-114). Cambridge: Cambridge University Press.
- [77] Sharma, Devyani. (2009). Typological diversity in new Englishes. *English World Wide*, 30(2). 170–95.
- [78] Sidwell, Paul. (2010). The Austroasiatic central riverine hypothesis. *Journal of language relationship* (4):117 – 134.
- [79] Singh, Niharika and Mishra, Ramesh. 2010. Simulating Motion in Figurative Language Comprehension. *The Open Neuroimaging Journal*, 4: 46-52.
- [80] Singh, Nissor. (1906). *Khasi – English Dictionary*. Shillong, Eastern Bengal and Assam Secretariat Press.
- [81] Slobin, D. (1987). Thinking for speaking. In *Proceedings of the thirteenth annual meeting of the Berkeley Linguistics Society* (pp. 435- 445).
- [82] Slobin, Dan, I. (1996). Two ways to travel: Verbs of motion in English and Spanish. In M. Shibatani, & S. A. Thompson (Eds.) *Grammatical constructions – their form and meaning* (pp. 195–219). Oxford: Clarendon Press.
- [83] Slobin, Dan I. (2004b). *The many ways to search for a frog: Linguistic typology and the ex- pression of motion events*. In Strömquist & Verhoeven (Eds.) (pp. 219–257).
- [84] Slobin, Dan, I. (2006). What makes manner of motion salient? Explorations in linguistic typology, discourse and cognition. In Space. In Hickman M and Roberts S (Eds.) *Languages: Linguistic systems and cognitive categories* (pp. 59-81). Amsterdam/Philadelphia. John Benjamins.
- [85] Smith, J D. (2003). The study of animal metacognition. *Trends in Cognitive Sciences*, 13(9): 389 - 396.
- [86] Soares, C., & Grosjean, F. (1984). Bilinguals in a monolingual and bilingual speech mode: The effect on lexical access. *Memory and Cognition*, 12: 380–386

- [87] Som, Bidisa. (2013). Understanding figurative language: Case of fictive motion in Bodo. 34th All India Conference of Linguists. 2014. NEHU: Shillong Meghalaya.
- [88] Stosic, D., Fagard, B., Sarda, L., Colin, C., (2015). Does the road go up the mountain? Fictive motion between linguistic conventions and cognitive motivations. *Cognitive processing*. Springer Verlag, 221 – 225.
- [89] Talmy, L. (1975). Semantics and syntax of motion. In J. P. Kimball (Ed.), *Syntax and Semantics* (pp. 181-238). New York: Academic Press.
- [90] Talmy, L. (1983). How language structures space. In J. H. L. Pick and L. P. Acredolo (Eds.), *Spatial Orientation: Theory, Research, and Application* (pp. 225-282). New York: Plenum Press.
- [91] Talmy, L. (1985). Lexicalization patterns: Semantic structure in lexical forms. In T. Shopen (Ed.), *Language typology and syntactic description: Grammatical categories and the lexicon, Vol. III* (pp. 57–149). . Cambridge, UK: Cambridge University Press.
- [92] Talmy, L. (1991). Path to realization: A typology of event conflation. In L. A. Sutton, C. Johnson and R. Shields (Eds.), *Papers of the Seventeenth Annual Meeting of the Berkeley Linguistics Society* (pp. 480-520). Berkeley: Berkeley Linguistics Society.
- [93] Talmy, L. (1996). Fictive motion in language and ‘ception’. In Bloom, P, Peterson, M A, Nadel L and Garrett M. F (Eds.), *Language and Space* (pp. 211-276). Cambridge, MA: MIT Press.
- [94] Talmy, L. (2000a). *Toward a Cognitive Semantics: Concept Structuring systems*. Vol. 1. Cambridge, MA: MIT-press.
- [95] Talmy, L. (2000b). *Toward a Cognitive Semantics: Typology and process in concept structuring*. Vol. 2. Cambridge, MA: MIT-press.
- [96] Taremaa, Piia. (2013). Fictive and actual motion in Estonian: Encoding space. *SKY Journal of Linguistics*, 26:151–183.
- [97] Wahlang and Koshy. (2018). Descriptions of co-extension paths in Khasi. *J South East Asian Linguistic Society*, 18(2): 40 - 65.
- [98] Wallentin M, Lund TE, Ostergaard S, et al. (2005a). Motion verb sentences activate left posterior middle temporal cortex despite static context. *Neuroreport*, 16(6): 649-52.

- [99] Wallentin M, Ostergaard S, Lund T, et al. (2005b). Concrete spatial language: see what I mean? *Brain Lang*, 92(3): 221-33.
- [100] Weinreich, U. (1953). *Languages in Contact*. The Hague: Mouton.
- [101] Zlatev, Jordan. (1997). *Situated Embodiment: Studies in the Emergence of Spatial Meaning*. Stockholm: Gotab.
- [102] Zlatev, Jordan. (2003). Holistic Spatial Semantics of Thai. In Palmer, G and Casad, E., (Eds.), *Cognitive Linguistics and Non-European languages* (pp. 305 – 336). Berlin: Mouton De Gruyter.
- [103] Zlatev, Jordan & Peerapat Yangklang. 2004. A third way to travel: The place of Thai in motion- event typology. In Strömqvist & Verhoeven (Eds.) (pp. 159–190).

Appendices

Appendix 1: R analysis commands

The following are commands used to test for the statistical effects of the features Affordability, Extension and their interaction on the production of NAM

R analysis in Khasi (glmer)

```
> khasi.extafford.interaction=glmer(NAM~Extension*Affordability+(1+Extension|Participant), famil  
y=binomial(link=logit), data=khasi)  
> summary(khasi.extafford.interaction)  
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) [glmerMod]  
Family: binomial ( logit )  
Formula: NAM ~ Extension * Affordability + (1 + Extension | Participant)  
Data: khasi  
  
          AIC      BIC    logLik deviance df.resid  
      961.7    993.7   -473.8    947.7      713  
  
Scaled residuals:  
      Min       1Q   Median       3Q      Max  
-1.2663 -0.8422 -0.6113  0.9939  1.9578  
  
Random effects:  
Groups             Name             Variance Std.Dev. Corr  
Participant (Intercept) 0.20067   0.448  
ExtensionDE 0.01167   0.108    -1.00  
Number of obs: 720, groups: Participant, 30  
  
Fixed effects:  
              Estimate Std. Error z value Pr(>|z|)  
(Intercept)    -0.04708    0.17325  -0.272  0.78582  
ExtensionDE      0.13839    0.21591   0.641  0.52155  
AffordabilityNaff -0.57645    0.22112  -2.607  0.00913 **  
ExtensionDE:AffordabilityNaff -0.35820    0.31463  -1.138  0.25492  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
Correlation of Fixed Effects:  
      (Intr) ExtnDE AffrdN  
ExtensionDE -0.667  
AffrdbiltyNF -0.608  0.488  
ExtntnDE:AN  0.428 -0.681 -0.703
```

Figure 6.1: R Analysis for Khasi data

R analysis in English (glmer)

Sample population 1

```
> eng1.extafford.interact=glmer(NAM~Extension*Affordability+(1+Extension|Participant), family=binomial(link=logit), data=eng1)
> summary(eng1.extafford.interact)
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial ( logit )
Formula: NAM ~ Extension * Affordability + (1 + Extension | Participant)
Data: eng1

      AIC      BIC    logLik deviance df.resid
  660.1    689.3   -323.1    646.1     473

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.4113 -0.8906  0.7126  0.8358  1.4960

Random effects:
Groups      Name      Variance Std.Dev. Corr
Participant (Intercept) 0.05255  0.22924
              ExtensionDE 0.00295  0.05431  1.00
Number of obs: 480, groups: Participant, 20

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      0.410488    0.194533   2.110  0.03485 *
ExtensionDE       0.073910    0.267156   0.277  0.78205
AffordabilityNaff -0.786346    0.265179  -2.965  0.00302 **
ExtensionDE:AffordabilityNaff -0.006734    0.375809  -0.018  0.98570
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) ExtnDE AffrdN
ExtensionDE -0.665
AffrdbltyNf -0.684  0.497
ExtnsnDE:AN  0.482 -0.711 -0.705
```

Figure 6.2: R Analysis for English data (group1)

Sample population 2

```
> eng2.extensionafford.interact=glmer(NAM~Extension*Affordability+(1+Extension|Participant), family=binomial(link=logit), data=eng_grp2)
> summary(eng2.extensionafford.interact)
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial ( logit )
Formula: NAM ~ Extension * Affordability + (1 + Extension | Participant)
Data: eng_grp2

      AIC      BIC    logLik deviance df.resid
  704.2    734.1   -345.1    690.2     521

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.7585 -0.8500 -0.5533  0.9203  1.8120

Random effects:
Groups      Name      Variance Std.Dev. Corr
Participant (Intercept) 0.310683  0.55739
              ExtensionDE 0.001291  0.03593  1.00
Number of obs: 528, groups: Participant, 22

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      -0.1012    0.2162  -0.468  0.63973
ExtensionDE       0.4612    0.2578   1.789  0.07359 .
AffordabilityNaff -0.6799    0.2639  -2.576  0.00999 **
ExtensionDE:AffordabilityNaff -0.1838    0.3725  -0.493  0.62170
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) ExtnDE AffrdN
ExtensionDE -0.568
AffrdbltyNf -0.567  0.476
ExtnsnDE:AN  0.402 -0.692 -0.709
```

Figure 6.3: R Analysis for English data (group2)

Appendix 2: Descriptions in Khasi and English

The following are examples of the types of descriptions used by the participants:

Table 6.1: Khasi description types

- | | | | | | | | |
|----|---|---|----------------------------------|--|--|--|---|
| 1 | <i>ŋa-joʔi</i>
1SG-see | <i>ka-wei</i>
3FSG-one | <i>ka-linti</i>
3FSG-path | <i>ba-</i>
REL | <i>ja:ʔd</i>
walk | <i>fa-jen</i>
ALL-house | |
| | 'I see a path that walks to a house.' | | | | | | (DE+Aff, image 1) |
| 2 | <i>ŋa-joʔi</i>
1SG-see | <i>ka-wei</i>
3FSG-one | <i>ba-</i>
REL | | <i>ja:ʔd</i>
walk | <i>stət</i>
quickly | <i>fa-jen</i>
ALL-house |
| | 'I see a path that walks quickly to a house.' | | | | | | (DE+Aff, image 1) |
| 3a | <i>Ka-linti</i>
3FSG-path | <i>ka-ba- beʔt</i>
3FSG-REL-straight | <i>bad</i>
and | | <i>ha-rud</i>
LOC-side | <i>joŋ-ka-ne-ka-linti</i>
GEN-3FSG-PROX-3FSG-path | |
| | 'A straight path and on the side of this road | | | | | | |
| 3b | <i>ki-don</i>
exist | <i>ar-tilli</i>
two-
NON.HUM.CL | <i>ki-deŋ</i>
3PL-tree | <i>ba</i>
<i>d</i>
and | <i>artilli</i>
two-num | <i>ki-maw</i>
3PL-stone | |
| | there are two trees and two stones.' | | | | | | (DE+Aff, image 2) |
| 4 | <i>ka-wei-ka-linti</i>
3FSG-one-3FSG-path | <i>na-ka-yeŋ</i>
ABL-3FSG-house | <i>ka-ba</i>
3FSG-REL | <i>jalām</i>
lead | <i>beʔt- beʔt</i>
straight-straight | <i>naŋ-ta</i>
ABL-there | |
| | 'A path from the house that leads straight-straight from there.' | | | | | | (DE+Aff, image 2) |
| 5a | <i>ka-linti</i>
3FSG-path | | <i>ka-lɔŋ</i>
3FSG-is | | <i>ka-ba</i>
3FSG-REL | <i>beʔt</i>
straight | <i>bad</i>
CONJ |
| | 'A path which is straight and | | | | | | |
| 5b | <i>ka-ba</i>
3FSG- REL | | <i>jalām</i>
lead | <i>fa-pɔʔ-ka-jaka</i>
ALL-INTERIOR-3FSG-place | | <i>ba</i>
REL | <i>i-kʰlaʷ</i>
seem-forest |
| | which leads into a place that is forest-like... | | | | | | (DE+Aff, image 2) |
| 6 | <i>ŋa-joʔi</i>
1SG-see | <i>ka-linti</i>
3FSG-path | <i>(ka)-ba</i>
(3FSG)-REL | <i>ɟrɔŋ</i>
long | <i>(ka)-ba</i>
(3FSG)-REL | <i>poi</i>
reach | <i>fa-jen- breʷ</i>
ALL-house-person |
| | 'I see a path that is long, that reaches to a house of a person.' | | | | | | (DE+Aff, image 2) |
| 7a | <i>na-ka-ne-ka- baranda</i>
ABL-3FSG-PROX-3FSG-veranda | | | | <i>ka-miʔ</i>
3FSG-exit | <i>ka-linti- ja:ʔd</i>
3FSG-path-walk | |
| | 'From this veranda exits a walking-path | | | | | | |
| 7b | <i>ka-ba-n</i>
3FSG-REL-FUT | <i>leʔt</i>
go | <i>fa-(pause)</i>
ALL | | <i>ka-ba-n</i>
3FSG-REL-FUT | <i>miʔ</i>
exit | |
| | that will go to.., that will exit.' | | | | | | (DE+Aff, image 2) |
| 8a | <i>ka-surɔk</i>
3FSG-road | | <i>(ka)-ba</i>
3FSG-REL | | <i>ruŋ</i>
enter | <i>fa-pɔʔ-ka- tənəl</i>
ALL-INTERIOR-3FSG-tunnel | |
| | 'A road that enters into a tunnel; | | | | | | |
| 8b | <i>ŋi</i>
3PL | <i>ŋi-peit</i>
3PL-look | <i>ja-ka-ne</i>
ACC-3FSG-PROX | | <i>ka-surɔk</i>
3FSG-road | <i>na-pdeŋ-ɟɔŋ-ka</i>
ABL-centre-GEN-3FSG | |
| | we are looking at this road from its center.' | | | | | | (DE+Aff, image 3) |

- | | | | | | | | |
|-----|--|---------------------------------------|---|---|------------------------------------|--|---|
| 9 | <i>ka-run</i>
3FSG-enter
'It enters into a tunnel which is deep.' | <i>fa-ka-tɒnəl</i>
ALL-3FSG-tunnel | | <i>(ka)-ba</i>
3FSG-REL | <i>jille^w</i>
deep | | (DE+Aff, image 3) |
| 10 | <i>ka-lɪnti</i>
3FSG-way
'A path that walks through a tunnel.' | <i>(ka)-ba</i>
3FSG-REL | <i>ja:^ɨd</i>
walk | <i>liŋba-ka- tɒnəl</i>
through-3FSG-tunnel | | | (DE+Aff, image 3) |
| 11a | <i>ka-dɔn</i>
3FSG-exist | <i>ka-surɔk</i>
3FSG-road | <i>(ka)-ba</i>
3FSG-REL | <i>mi?</i>
exit | | | |
| 11b | <i>na- ka- krem</i>
ABL-3FSG-cave
'from a cave that turns to the right.' | <i>(ka)-ba</i>
3FSG-REL | <i>k^hun</i>
turn | <i>fa-ka-mɔn</i>
ALL -3FSG-right | | | (DE+Aff, image 4) |
| 12 | <i>ka-surɔk</i>
3FSG-road | <i>ka-ba</i>
3FSG-REL | <i>wan-mi?</i>
come-exit | <i>liŋba-u-wei</i>
through-3MSG-one | <i>u-lom</i>
3MSG-hill | | (DE+Aff, image 4) |
| 13 | <i>ka-ŋiŋ-keŋ</i>
3FSG-NMZ-sling | <i>ka-ba</i>
3FSG-REL | <i>na-fi-lianŋ</i>
ABL-one-side | <i>lom</i>
hill | <i>fa-fi-lianŋ</i>
ALL-one-side | <i>lom</i>
hill | (DE+Aff, image 5) |
| 14 | <i>u-pa^yt</i>
3MSG-pipe | <i>u-ba</i>
3MSG-REL | <i>ja:^ɨd</i>
walk | <i>be^t - be^t</i>
straight-straight | <i>fa-bar</i>
ALL-EXTERIOR | <i>na-krem</i>
ABL-cave | <i>fa-bar</i>
ABL-outside
'A pipe which walks very straight to the outside, from the cave to the outside' (DE-Aff, image 1) |
| 15 | <i>u-paip</i>
3MSG-pipe
'A pipe that inserts into the earth.' | <i>u-ba</i>
3MSG-REL | | <i>p^hruŋ</i>
Insert | | <i>ha-pɔʔ-k^hində^w</i>
LOC-INTERIOR-earth
(DE-Aff, image 1) | |
| 16 | <i>ki-tillɔŋ-um</i>
3PL-source-water
'The water sources that pierce through the stones.' | | <i>ki-ba</i>
3PL-REL | <i>sam</i>
pierce | | <i>liŋba</i>
through | <i>ki-ma^w</i>
3PL-stone
(DE-Aff, image 1) |
| 17a | <i>u-paip</i>
3MSG-pipe | <i>u-ba-</i>
3MSG-REL | <i>ruŋ</i>
enter | <i>ha-pdeŋ</i>
LOC-center | <i>ka-wei</i>
3FSG-one | <i>ka -t^hle^w</i>
3FSG-hole | |
| 17b | <i>bad</i>
CONJ | <i>u-ta-u-paip</i>
3MSG- | <i>u- ja:^ɨd</i>
3MSG-walk | <i>fa-k^hmat</i>
ALL-front | | | |

INV-
3MSG-
pipe
and that pipe walks forward' (DE-Aff, image 2)

18 *u-wei* *u-paip* *u-run* *fa-pɔʔ-krem*
3MSG-one 3MSG-pipe 3MSG-enter ALL-INTERIOR-cave
'One pipe enters into a cave.' (DE-Aff, image 2)

19 *ka-fens* *ka-ba* *ja:ʔd* *naŋ-ne fa-tei-fa-pɔʔ- ka-um*
3FSG- 3FSG-REL walk ABL-PROX ALL-DIST-ALL-INTERIOR-3FSG-water
fence
'A fence that walks from here to there into the water.' (DE-Aff, image 5)

20 *...ha-* *u-ta-u lom* *dɔn* *ki-jiŋ-ker* *ki-ba* *wan-pɔi* *fa-kʰmat...*
kʰmat
LOC-front 3MSG-INV-3MSG- exist 3PL-NMZ- 3PL- come- ALL-front
hill fence REL reach
'In front of that hill, there are fences that come reaching to the front.' (DE-Aff, image 6)

21a *...ki-jiŋ-ker* *ki-ba* *sdaŋ* *na-u-ne-u-deŋ*
...3PL-NMZ-fence 3PL-REL start LOC-3MSG-PROX-3MSG-tree
'Fences that start from this tree' (DE-Aff, image 6)

21b *ha-duʔ* *ba* *kut* *fi-linter* *ɔŋ-ka-ne-ka-madan*
LOC-till REL end one- GEN-3MSG-PROX-3FSG-
breadth ground
'till the end, the whole breadth of the ground...' (DE-Aff, image 6)

22 *ka-wei-ka-linti* *ka-ba* *ja:ʔd* *siak,* *tiŋ* *ha-kʰmat* *jiŋ-kʰaŋ*
kʰ
oʔ
3FSG-one-3FSG- 3FSG-REL walk straight on hit ALL-front NMZ-close
path
'A path that walks straight on, hits the front of the door.' (AE+Aff, image 1)

23a *Don* *ar-tilli* *ki-jiŋ-kʰaŋ-jit* *i-jeŋ* *ba-rit*
Exist Two- NON.HUM.CL 3PL-NMZ-close- 3DIM- REL-small
glass house
'There are two windows, a house that is small,

23b *i-weʔ* *i-jiŋ-kʰaŋ* *ki-phlaŋ* *bad* *ka-linti-jad*
3DIM-one 3DIM-NON-close 3PL-grass and 3FSG-path-walk
one door, grass and a path.' (AE+Aff, image 1)

24	<i>ka-lɪnti</i> 3FSG-trail	<i>ka-ba</i> 3FSG-REL	<i>leʔt - jaːʔd</i> go-walk	<i>ka-ba</i> 3FSG-REL	<i>tiŋ-kʰoʔ</i> hit	<i>ha-kʰmat- ʃiŋ-kʰaŋ</i> LOC-front- NMZ-close	‘A trail that goes-walks hitting the front of the door.’ (AE+Aff, image 2)	
25	<i>...ka-ta</i> ...3FSG-INV	<i>ka-surɔk</i> 3FSG-road	<i>ka-par</i> 3FSG-crawl	<i>na-pɔʔ- ʃoŋ-u-lom</i> ABL-INTERIOR-GEN-3MSG-hill	‘That road crawls from inside of the hill...’ (AE+Aff, image 4)			
26	<i>ka-ʃiŋken</i> 3FSG-bridge	<i>ka-ba</i> 3FSG-REL	<i>bteŋ</i> continue	<i>na-u-wei</i> ABL-3MSG-one	<i>u-lum</i> 3MSG-hill	<i>ʃa-u-wei</i> ALL-3MSG-one	<i>u-lom</i> 3MSG-hill	‘A bridge that continues from one hill to another hill.’ (AE+Aff, image 5)
27	<i>ka-ʃiŋ-ken</i> 3FSG-NMZ-bridge	<i>ka-ba</i> 3FSG-REL	<i>pon</i> bridge-over	<i>na-fi-lian</i> ABL-one-side	<i>ʃa-fi-lian</i> ALL-one-side	‘A bridge that bridges over from one side to another side.’ (AE+Aff, image 5)		
28	<i>...u-paip...</i> ...3MSG-pipe	<i>u-par</i> 3MSG-crawl	<i>naŋ-ta- na-pɔʔ- ʃoŋ-u-lom</i> ABL-INV-ABL-INTERIOR-GEN-3MSG-hill	‘A pipe crawls from that from inside of the hill...’ (AE-Aff, image 1)				
29a	<i>u-pait- um</i> 3MSG-pipe-water	<i>u- jaːʔd</i> 3MSG-walk	<i>liŋba</i> throu gh	<i>u-lum- baʔ</i> 3PL-mountain-big	‘A water pipe walks through a big mountain			
29b	<i>bad</i> CONJ	<i>u-ksam</i> 3PL-claw	<i>liŋba</i> through	<i>u-lom</i> 3MSG-mountain	‘and claws through the mountain.’ (AE-Aff, image 1)			
30	<i>ka-ʃiŋ-ker</i> 3FSG-NMZ-fence	<i>ka-sdaŋ</i> 3FSG-start	<i>na-u-deŋ</i> ABL-3MSG-tree	<i>ka- jaːʔd</i> 3FSG-walk	<i>ter-ter</i> in a sequence	‘A fence starts from a tree, goes consecutively (on and on).’ (AE-Aff, image 6)		

English description types

1. *I see a tree in an open space and on one side there is a fence made up of wood going to the other side. (AE-Aff6)*
2. *There is a footpath leading to a warehouse. (AE+aff1)*
3. *There is a narrow road which leads to a small house with two windows and one door(AE+Aff1)*
4. *I see a small house with a chimney on it and a small lane opens into the house. (AE+Aff1)*
5. *There is some one way which is going straight to that one house and on the side there of that way there is some grasses and some trees. (AE+Aff2)*
6. *Grills made of logs tied with ropes with equal intervals from each other running down till the end of the seashore. (DE+Aff5)*
7. *A lone shed, possibly a tool shed with a stretch of private road toward the door. (DE+Aff1)*
8. *There are logs of trees and electric cables, running, one after another (AE-Aff3)*
9. *There is a u shape hill where the bridge pass from one side to the other of the hill. (Ae+Aff5)*
10. *I am looking up and there is a bridge connecting one end of the crevace and the other end. (AE+Aff5)*
11. *Here it is one stone that is letting that road or river to pass through it. (AE-Aff1)*
12. *In this picture there is some mountain and below that mountain there is a cave and a big pipeline is coming out through that and on each side of it there are some rocks. (AE-Aff1)*
13. *There is a pipeline that is exiting a tunnel. (AE-Aff1)*
14. *An artificial bridge with a pipe coming through it, underneath it, possibly carrying sewage as the water seems dirty. (AE-Aff2)*
15. *I see a bridge that joins one end of a cliff with another cliff on the other side. (AE+Aff5)*
16. *I see a pipe going through a wall. (DE-Aff2)*
17. *I see a small path which is straight which leads directly to a small house,that house has a window. (DE+Aff1)*
18. *I see a view from the front porch of a house which shows lane going straight, deep into the forest and on the left side of the house there are two trees. (DE+Aff2)*
19. *In this picture we can see a road which is moving across a tunnel and on the side of the road there are fences surrounding it. (DE+Aff4)*
20. *There is one road passing through the underground hill which is going to the right side. (DE+Aff4)*
21. *A bridge made of rope and wood that links one end of a hill to the other. (DE+Aff5)*

Appendix 3: Eye-tracking preliminary report

Eye Tracking Experiment: from Cognitive linguistics to psycholinguistics

Based on the results from the elicitation experiments, an eye tracking experiment was performed to see what support can be gained from eye tracking data on the same. The results from the elicitation experiments showed that the affordability of human motion on an object has a significant effect on the elicitation of NAM expressions for images which had a 1st Person perspective. The same was not the case for the 3rd person perspective, i.e., the affordability of motion did not make a significant difference to NAM productions in the third person perspective. The results confirm Blomberg's hypothesis of there being two different attitudes in the experience of Non-actual motion. Blomberg calls the first person encounter of the world 'enactive' and the third person 'visual scanning' (Blomberg 2014).

Eye-movement studies: motion and fictive motion

Eye tracking studies have shed insight to the question of whether or not language affects other aspects of cognition, particularly in spatial cognition. In a study of whether or not the grammatical structuring of motion information affects eye movements, Papafragou and her team found effects of Slobin's "Thinking for speaking". The study pointed to a correlation between attention to an ongoing motion scene with a language's grammatical structuring of motion, i.e. whether motion verbs encode path information or manner information (Papafragou et.al., 2008). In other studies, Papafragou and her team were able to also tease out where language affects other cognitive processes, in this case, memory and categorisation. The experiments showed that differences arise only when the task is an explicit linguistic task and not otherwise (Papafragou et.al., 2002). If we move from this assumption, and go on to fictive motion, how can we the motion/non-motion grey area psycholinguistically?

Matlock and Richardson (2004, 2007, 2010) through a series of Reaction time and Eye-tracking experiments showed firstly, that we do simulate experience motion while comprehending fictive motion expressions and secondly, that eye-movements, scanning and gaze duration were affected by fictive motion descriptions as compared to descriptions without fictive motion expressions. Their reaction time study (Richardson and Matlock 2004) pointed to a positive correlation between processing time of easy landscapes vs difficult landscapes, when Fictive motion is used to describe visual images. These reaction time differences did not show up when non-Fictive motion descriptions were used. Their results pointed in the direction of "comprehension of descriptions fictive motion across a domain is influenced by factors that would affect actual motion across the domain" (Richardson and Matlock 2007). This was a

critical juncture in which cognitive linguistic theory was linked to psycholinguistic behaviour, leading to the theorisation of the engagement of *simulated motion* as a cognitive engagement while processing fictive motion. Following this experiment, they tested if these differences in reaction time could also be reflected in eye-movements. Their study found a gaze duration difference between easy and difficult terrain sentences, *only* when the descriptions involved fictive motion. The results from this experiment showed a correlation between language comprehension and simulation of motion during the processing of fictive motion (Matlock, 2007). This study was further validated by Singh and Mishra (2010). A novelty in Singh and Mishra's study was the finding of gaze-duration effects by fictive motion descriptions in the absence of visual stimuli as well (Singh and Mishra, 2010).

Given this background of behavioural and eye-tracking studies, this experiment probes the question of how eye-movements would, if at all, be guided by speech, given the differences in which extended objects are presented to us in the world around us.

The questions that this section looks at are as follows: If there are two modes or attitudes that motivate the production of NAM expressions, will these be reflected in eye movements? In fact, if one of the underlying reasons for the production is 'Visual scanning', this should lead us to expect a more equally distributed pattern of saccades on the object. Enactive experience would therefore have a less equally distributed number of saccades. To test this, we ran a pilot study where participants are shown the same set of images from the elicitation experiment. Before they described the objects, they were asked to look at the object for as long as they wanted to, after which they described the object on a blank screen. The patterns of eye movements differed between 3rd person and 1st person perspectives, where the 3rd person perspective involved the scanning of the objects, while 1st person perspectives involved fixations at the end of the object, as shown in the following images of eye movements:

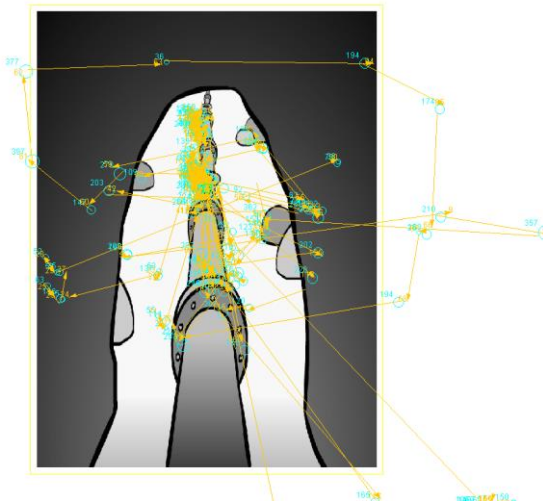


Fig.1 First person
(Pipe entering a tunnel)

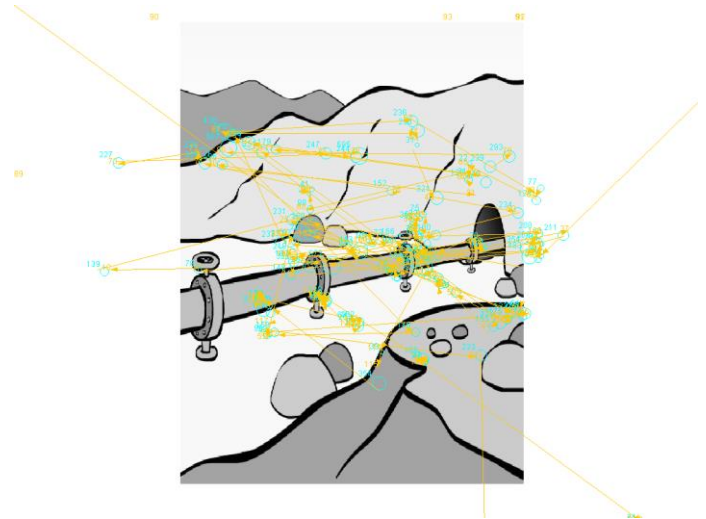


Fig.2 Third person
(Pipe entering a tunnel)

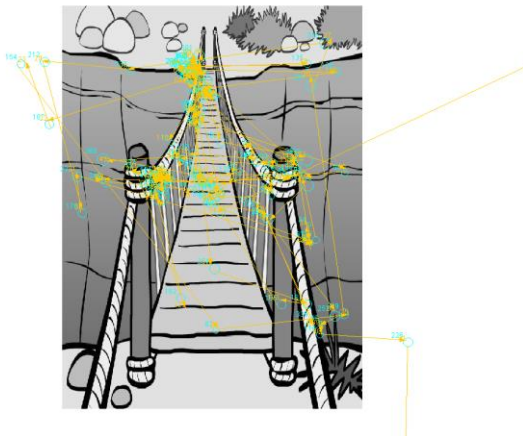


Fig.3 First person view of a bridge

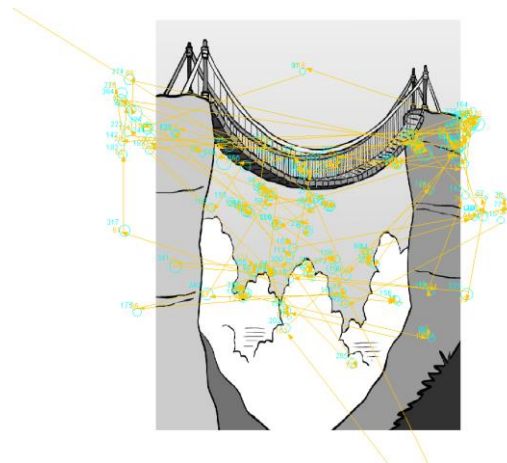


Fig.4 Third person view of a bridge

In the images, the density of blue circles (or the yellow tips of the arrows) is the density of fixations (or the ends of saccades). The yellow lines show the saccades of the eyes. These images are from a pilot study done with native speakers of English about a year ago, taken while they were looking at the images before describing them. As we can see, the fixation density for the first-person perspective images is located around the end of the object (as compared to the length of the object), whereas the fixation density for the third person perspective images is more equally distributed. Given that we know that a fixation point is the point at which information is being gathered and saccades are the jumps that the eyes make to find information, we can assume that the eyes have varying mechanism for information

gathering when we're looking for information from the first person perspective vs the third person perspective.

Of course, this is not necessarily mean that these presentations are exclusive of each other when we encounter the world, we probably scan objects and enact them as we experience the world. What happens rather, is that our attention and hence our eye movements differ between the two. With images, it was hard to say whether it was the image layout itself that was guiding the participants' eyes or whether it had something to do with perspective. Aside from image layout, the considerations of luminosity, colour gradient, object types and object positions make it a little harder to control for eye movements with images.

To being with, we decided to follow Spivey et al (2002) and check whether speech guides eye movements in fictive motion descriptions as well.

Hypothesis

Following the recent works by Blomberg (2014), and the elicitation experiments performed in Khasi, we decided to look at whether there are different underlying mechanisms, namely, enactive and visual scanning that are operational in the processing of NAM/fictive motion expressions. To test this, we enter with the assumption that speech would guide eye-movements (Spivey et al. 2002). Hence, description of 1st person approach to the world, would guide the eyes to either scan up wards or maintain fixations, with relatively few scanning, in the central-upper half of the screen, i.e, on the Y-axis of the screen. Descriptions of 3rd person approaches on the other hand would guide the eyes to scan from one side of the screen to another, i.e. on the X-axis of the screen.

Methodology

The experiment was displayed on a PC monitor linked to Eyelink 1000, head mount eye tracker (SR Research). Both eyes were tracked.

The experiment starts with an instruction screen, which includes asking participants to keep their eyes open and to look at the screen throughout the experiment. A calibration of the eyes follows after the instructions screen. After calibration, a screen appears which asks them to press 'Space' whenever they are ready. When 'Space' is pressed, it triggers the presentation of a blank screen along with an audio stimulus. The audio stimulus describes a visual scene (pictures from the elicitation experiment). This presentation of stimuli is timed for 10000ms.

Following this, some of the stimuli will go on to an image matching test. The test will ask participants whether the image they see is the one that was talked about in the audio stimulus. They can grade the likelihood of a match between 1 – 5, with 1 being ‘Definitely not’, 2 ‘Very unlikely’, 3 ‘I don’t know’, 4 ‘Very likely’, 5 ‘Definitely’. When they press a key, it triggers the next description. In case there is no image matching test, they move on to the next trial.

An inter-trial interval is kept between 500 – 1500ms.

Participants were later asked if they knew what the experiment was on. Many replied that it seemed to be test on how well one can imagine the scenario given.

Stimuli

30 stimuli were presented:

6 descriptions of images with objects from first person view and affording human motion;

6 descriptions of images with objects from third person view and affording human motion;

6 control descriptions with explicit directions (e.g this road goes from left to right or this road this up);

3 control descriptions of images with objects from first person view and

3 control descriptions of images with objects from of third person view.

Images for the ‘image matching’ test include 3 of each of the above and 3 of non-extended objects, e.g. a chair and 3 objects in motion, animals or cars.

All sentences are controlled for word length and syllable length. Mean word count = 18.83, std.dev = 1.24. Mean syllable count = 25.83., std.dev= 1.82.

The audio recordings are done with an Indian speaker of English, to decrease the chances of participants having problems with the accent.

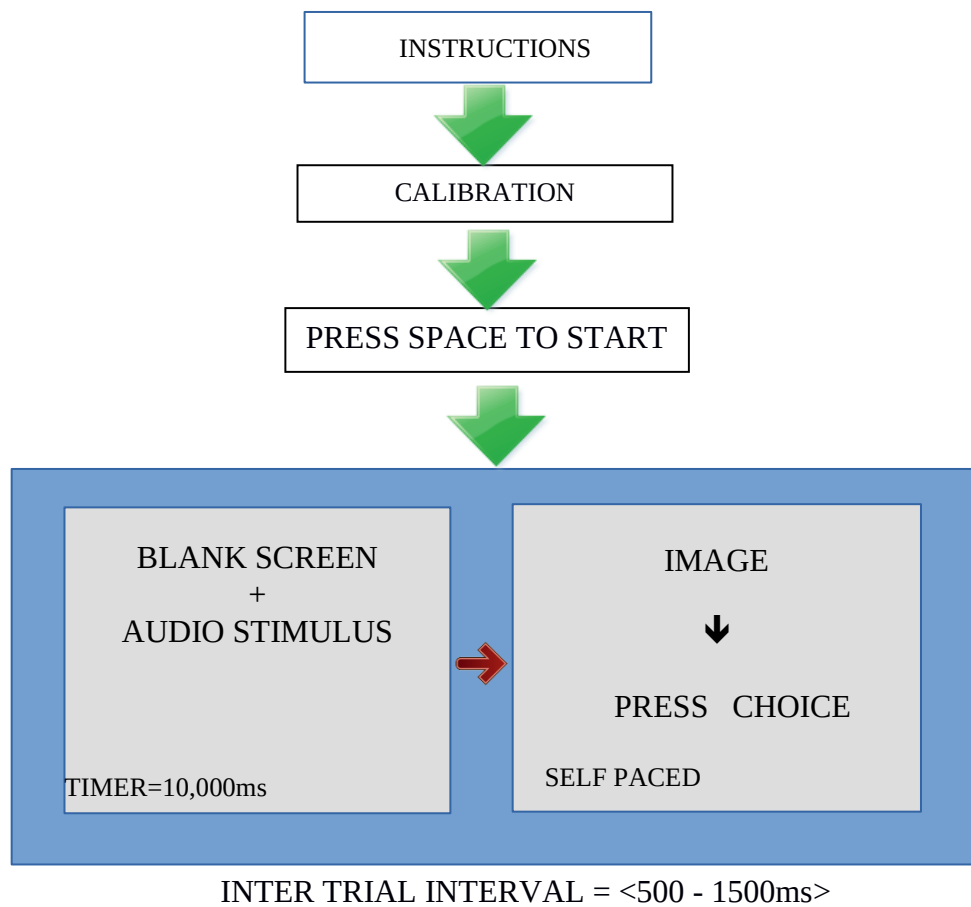
Participants

20 Telugu bilinguals speaking English as a second language.

Average Age	Gender		Education	English (L2) Competence
24	13 male	7 female	University students	Basic - Fluent

I was unable to control for fluency, but compensated by trying to make the sentences as simple as possible, avoiding difficult words and hoping to fit these sentences into a wider range of speakers. As a minimal test of frequency, all participants were asked to give directions in English on how to get from one landmark to another within the University of Hyderabad.

A flow chart of the experiment



Analysis

Each audio stimulus was divided into two sentences each – a description of the path in the initial 6 seconds and a description of objects (grass etc) around the object. An analysis on fixation positions for the first 6 seconds of the audio clips was done. The positions of the eyes while hearing the description would give us insight to where they were moving and on what axes for which descriptions.

P vals of third (+ and - directions) and first (+ and - directions).

The alternative hypothesis for the variance between third person description, both with and without direction(third) and first-person description, with and without direction(first) on the X-axis is that the third will have a greater variance than the first. A single tailed f-test was performed. The resultant p value is 0.189895056745, showing no significant difference.

Similarly, on the Y-axis the opposite was expected, i.e. the first person, both with and without directions would have a greater variance than the third person, with and without direction. The resultant p value was again insignificant, $p\text{ val} = 0.999776149277$.

P vals of third (-directions) and first (-directions).

To check what was happening, the controls were separated from the test condition and the same f-test was performed. The resultant p value for the variance between third without direction and first without direction (hypotheses variance of third>first) on the X axis is 0.0400230157869^* .

Similarly, a test was performed on the y-axis (hypotheses variance of first>third). The resultant p value is 0.822465549014 .

P vals of third(+directions) and first(+directions).

An analysis of eye movements for the control descriptions on X- axis gave the following results:

third > first, $p\text{ vals} = 0.91015571762$

On Y-axis the first> third variance f test gave the following result, $p\text{ val} = 0.999998607216$

P vals of third + direction and -direction on X-axis

To check if there is a difference between the control (+direction) and the test condition, an assumption that they would be equal was made and a two tailed analysis was done. The test gave the following results:

P val for two tailed analysis = 1.99517615236

P vals of first + and – direction on Y-axis

To check if there is a difference between the control (+direction) and the test condition, an assumption that they would be equal was made and a two tailed analysis was done. The test gave the following results:

P val for two tailed analysis = $5.86213697663e-09$

Discussion

As the p-values tell, the only significant difference given by the tests were eye-positions on the X-axis when no directions were given for the third vs first person descriptions. This follows the expectation that third person descriptions would have more fixations on the X-axis when compared to first person descriptions.

The other extremely significant p value was when there was an assumption that there would be no difference in the variance in upward movements of the eyes on the Y-axis between with and without directions for first person descriptions. The reason behind this could be that when directions like 'up' are given, the size range of saccades or the positions of fixations from the Y-axis reduce with the specific given directions. The computed variation of fixations from the mean on the Y-axis in first+ direction and first-direction are:

Variance of Y *without direction*, first 72949.2120181

Variance of Y *with direction*, first 49275.6573432

On the X-axis and third person descriptions on the other hand, one would expect a difference between first- and third-person overall eye movements on the X -axis. To start with, scatter plots of the eye movements were made to visualise the data.

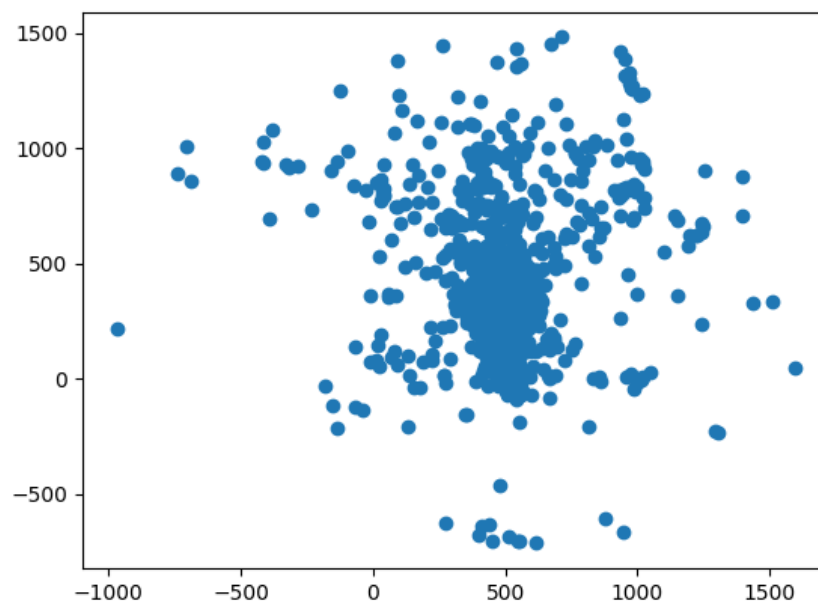


Fig.1. First +/- direction

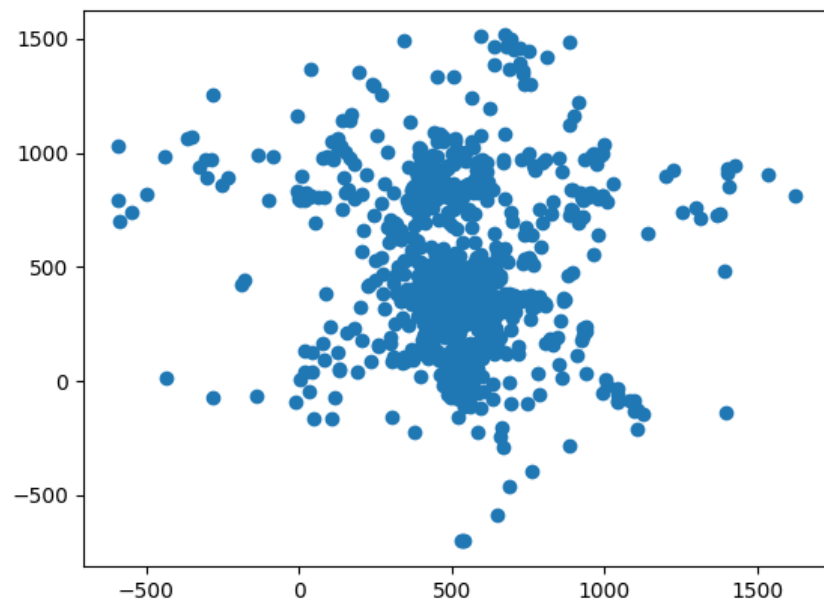


Fig.2. Third +/- direction

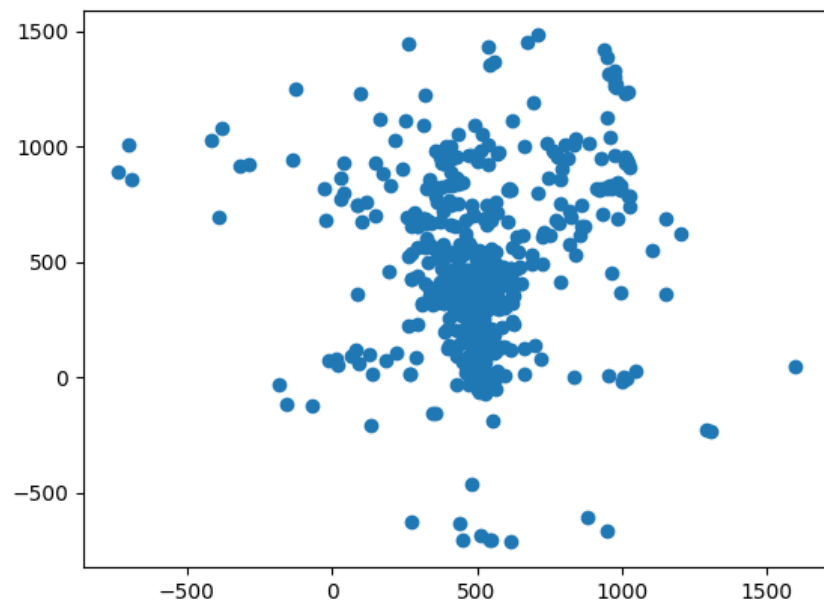


Fig.3. First - direction

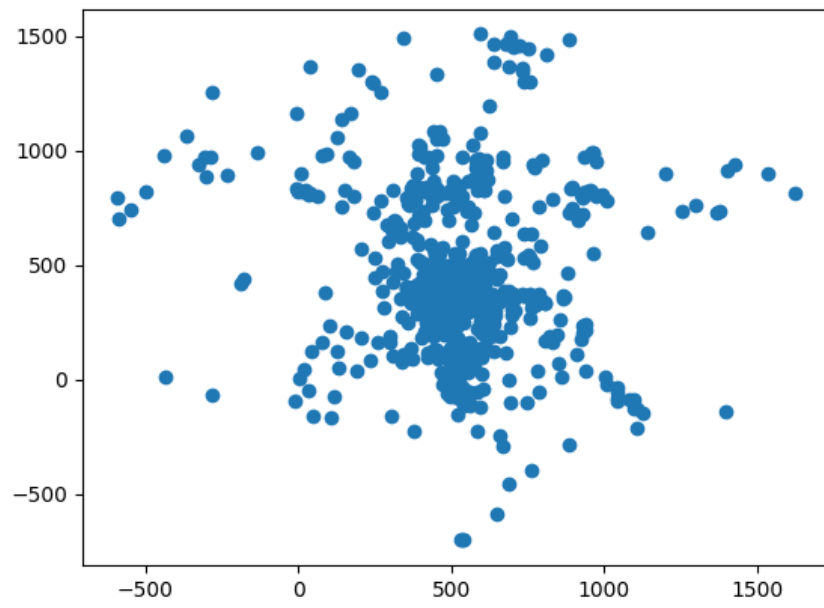


Fig.4 Third-direction

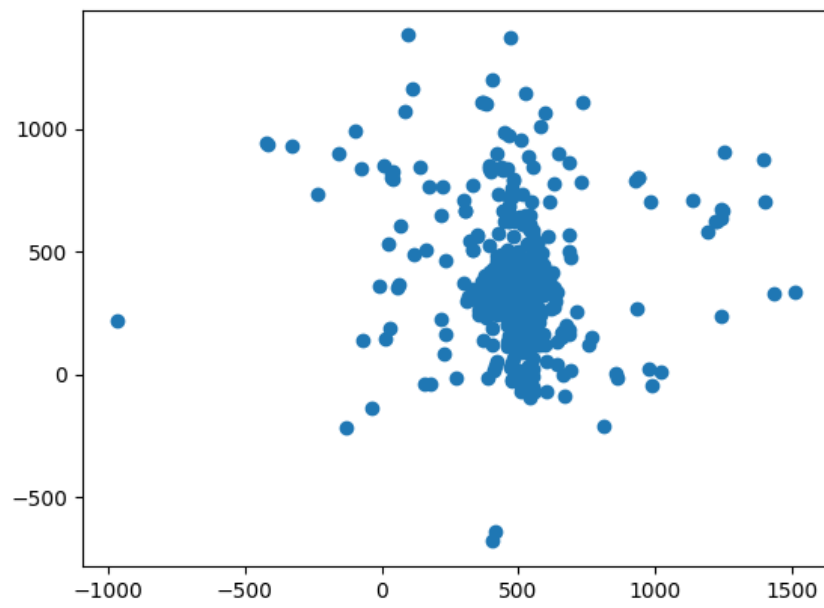


Fig.5 First +Direction

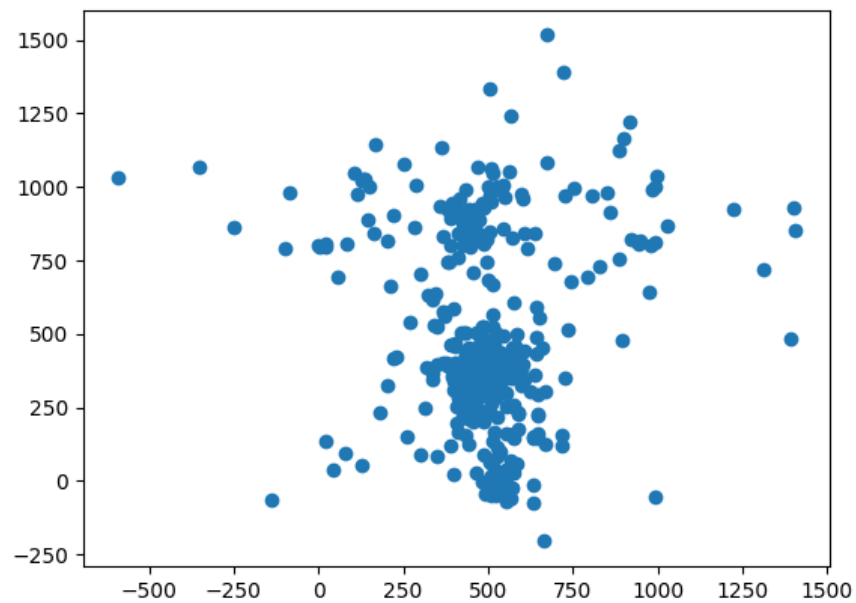


Fig. 6. Third + Direction

What is unexpected is the decrease in scanning in the third + direction, which given the specifications of direction, one would expect an increase instead of a decrease in fixations. One of the reasons behind this could be that when specific directions are given, there is a natural direction of saccades and given specific directions, this directionality is disrupted, making the eyes go back to the centre, by which time, another set of descriptions guide the eyes. To check this, we looked at the third +direction eye movements separately. The third +direction descriptions had two descriptions where the directionality was from left to right and one where the directionality was from right to left.

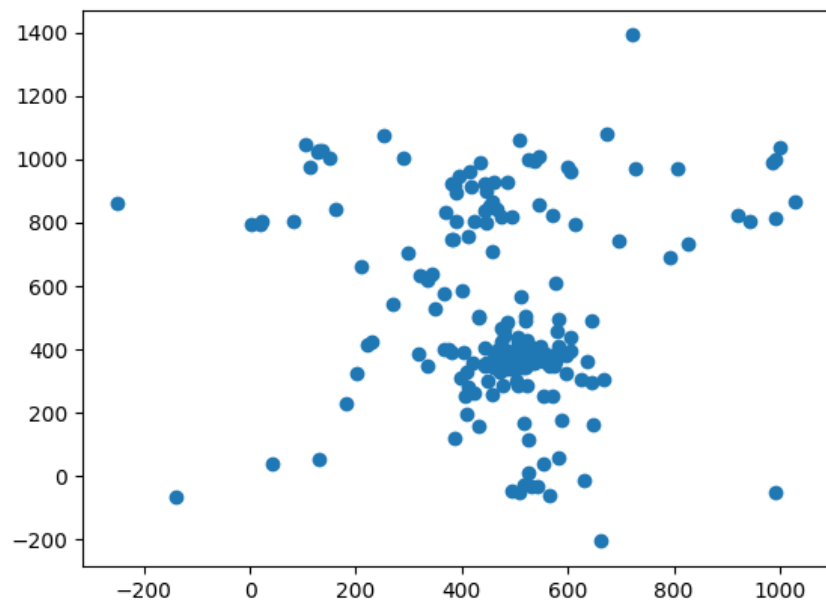


Fig.7 Left to right description

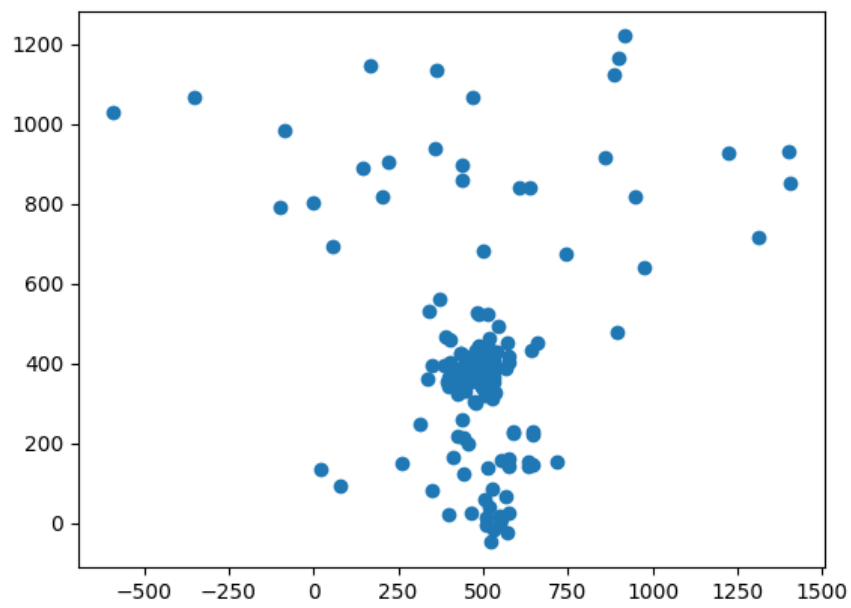


Fig.8. path ends on the 'right'

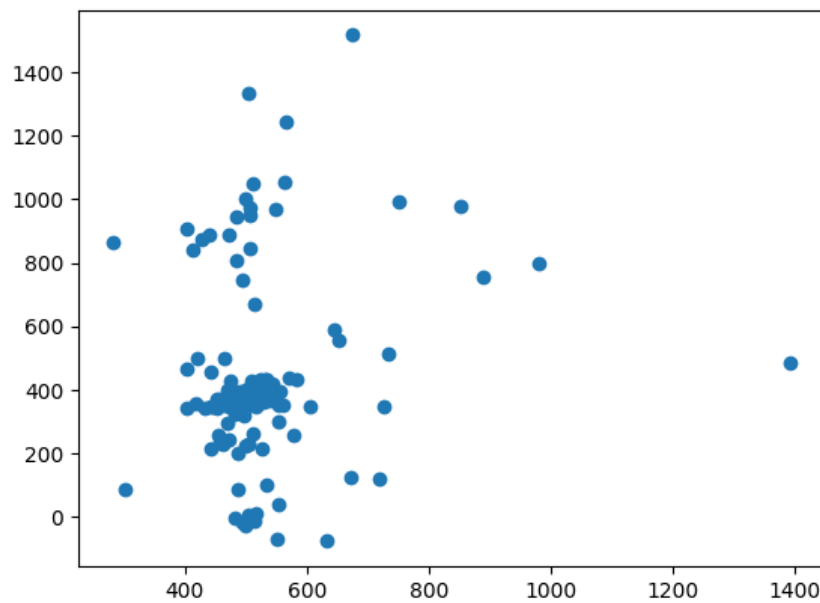


Fig.9. Right to left description

Fig. 9. shows that when a right-to left description was given, the eyes have lesser movement on the X-axis. This needs to be further looked into.

A double tailed F-test was done on these points as well with the following results:

p val of left to right vs right to left descriptions $9.62712516951e-10$, very significant.

p val of end of the right vs right to left $3.21712281242e-18$, very significant.

Discussion

A closer look at the scanning descriptions of objects, ‘running from right to left’ vs ‘running from left to right’ had a significant effect on the variances of eye movements along the x-axis. The reasons for this need further exploration. One possible cause could be that ‘right to left’ descriptions disrupt the direction of scanning and bring the eyes back to the centre. However, it is hard to tell with this amount of data.

Conclusion

This experiment shows that there is some guidance of eye-movements by speech. When participants were given a first-person description of a scene, their eyes tended to look straight ahead or move on the Y-axis of a blank screen. Similarly, when given words like ‘across’ or ‘along the side’ the eyes of the participants moved more along the X-axis of the screen. However, when given directions, the first-person perspective had lesser variance of eye-

fixations on the y-axis as compared to when they were not given directions. This could be because the only possible directionality in this experiment is 'up' which then gives a point of reference, unlike a simple 'straight ahead'.

In the case of directed 'left-right' or 'right-left' analysis of eye movements, there is a disruption of directionality when directions were given from 'right – left' affecting the whole data of scanning descriptions. This does not mean that scanning does not happen, and we see that it does, however, 'right – left' directed descriptions had more eye fixations on the centre rather than the scanning that is seen when 'left – right' or 'ends on the right' descriptions were given.

To conclude, the underlying mechanisms that operate in the processing of NAM expressions might be different depending on how the objects are experienced in terms of perspectives. This results of this experiment need to be further examined, however, it does point in the direction of fictive motion being available even when there is no scanning of an object as such, in which case, enactive motion is another likely candidate for the processing of NAM expressions.

Bibliography

Matlock, T., & Richardson, D.C. (2004). Do eye movements go with fictive motion? *Proceedings of the 26th Annual Conference of the Cognitive Science Society* (pp.909-914). Mahwah, NJ: Lawrence Erlbaum.

Matlock, T. (2010). Abstract motion is no longer abstract. *Language and Cognition*, 2, 243-260.

Richardson, D.C. and T, Matlock (2007). The integration of figurative language and static descriptions: An eye-movement study of fictive descriptions. *Cognition*, 102, 129 – 138.

Papafragou, A, Maseey, C and Gleitman, L. (2002). Shake, Rattle and Roll: The representation of motion in Language and Cognition. *Cognition* 84,189 – 219.

Papafragou, A, Hulbert, J and Trueswell, J (2008). Does language guide event perception? Evidence from eye movements. *Cognition* 108, 155 – 184.

Singh, N and Mishra, R (2010). Simulating motion in Figurative Language Comprehension. *The Open Neuroimaging Journal* 4: 46 – 52.

Spivey, M.J., Tyler, M.J., Richardson, D.C., & Young, E.E. (2000). Eye movements during comprehension of spoken scene descriptions. *The Proceedings of the Twentysecond Annual Cognitive Science Society Meeting*, 487-492.

Publications

DESCRIPTIONS OF CO-EXTENSION PATHS IN KHASI¹

Maranatha Grace T Wahlang
University of Hyderabad
maranathat@gmail.com

Anish Koshy
The English and Foreign Languages University, Hyderabad, India
anish@efluniversity.ac.in

Abstract

This study looks at the description of inanimate objects in Khasi using motion or dynamic expressions. The paper specifically looks at how information on path and manner is encoded in such expressions. These descriptions are taken from an elicitation experiment. The first part of the paper gives a brief account of the experiment and the quantitative results. The experimental design consists of speakers describing visual scenes containing spatially extended objects, such as roads, pipes and fences. The second part of the paper focuses on the linguistic analysis of the descriptions. It is found that Khasi speakers in this study use a combination of path verbs, manner verbs, path and manner conflating verbs, and compound verbs with deictic components to describe these objects. A fairly large repertoire of verb types is attested in the data. The combination *ja'd* 'walk'+ *satellite* is the most frequently used verb, placing Khasi in the category of satellite languages. It is also observed, that boundary crossing acts as a stimuli feature with path-conflating verbs. These constitute the second and third most frequently used verb types. The use of some *path+manner* conflating verbs places Khasi in the category of languages with non-actual movement, in the hierarchy proposed by Blomberg.

Keywords: co-extension path, non-actual motion, spatial grammar, extended objects, image descriptions, linguistic typology of motion, Khasi

ISO 639-3 codes: kha

1. Introduction to theories of spatial cognition

This paper examines Khasi descriptions of inanimate, spatially extended objects using motion verbs. The descriptions were given by native speakers of Khasi in an elicitation experiment, designed to test the motivations for the use of motion verbs to describe static, inanimate entities. There are two aspects to the study, one, the cognitive motivations for the use of motion verbs, and two, the categorization of Khasi in spatial grammar typology.

Spatial cognition is an important cognitive capacity. Its centrality can be seen in the way we use our bodies (and their configurations) in relation to other objects, to talk of many other aspects of life – emotions (e.g. to *fall* in love), time (e.g. time flies, inflation of prices (e.g. prices *rise/go up*), amongst many other aspects (Lakoff and Johnson 1999; Lakoff and Johnson 2003). It is no surprise then that studies in spatial

¹ This paper is a result of discussions and comments with Prof. Prajit K Basu, Prof. Raju S Bapi, Prof. V Duggirala, Dr. Johan Blomberg and Prof. Jordan Zlatev. We were able to run this experiment due to the generosity of Dr. Johan Blomberg and Prof. Jordan Zlatev. We would like to thank all of them for their time and effort. We also thank the reviewers for their suggestions.

cognition have optimistically looked for universals that may form the core of our spatial thinking. Proposals of universals have been challenged, fine-tuned and fortified by studies in spatial grammar typologies, with systematic differences in spatial grammars reported across languages (Levinson and Wilkins 2006).

Two prominent structural elements identified to analyze spatial cognition and language, which are shared by every language, include *Figure* and *Ground* (Talmy 1985; Levinson 1996). *Figure* is the object that is discussed with reference to another object, the *ground*. The relation between the two can be static, kinetic or translational (Levinson 2003; 2006; Talmy 1996; 2000). *Stasis* and *kinesis* (*translocation*) form the binary conceptual subdivisions of our spatial reasoning: objects are spatially at rest or moving. Between stasis and kinesis, we have what scholars have referred to as fictive motion/abstract motion/subjective motion/non-actual motion (Talmy 1983; 1991; 1996; Jackendoff 1983; Langacker 1990; Matsumoto 1996; Blomberg 2014). Examples of such descriptions include those in 1a to 1c.

- 1a. The fence goes/zigzags/descends from the plateau to the valley.
[cf. I went/zigzagged/descended from the plateau to the valley.]
- 1b. The field spreads out in all directions from the granary.
[cf. The oil spread out in all directions from where it spilled.]
- 1c. The soil reddens toward the east.
[cf. (i) The soil gradually reddened at this spot due to oxidation.
(ii) The weather front advanced toward the east.]
Talmy (2000a: 138)

These descriptions include what are prototypically motion verbs or verbs of change - ‘goes’, ‘zigzags’, ‘descends’, ‘spreads’ and ‘reddens.’ However, these are used for static objects: ‘the fence’, ‘the field’ and ‘the soil’ respectively. The first example is a type of fictive motion expression that this paper is investigating, which is called a ‘co-extension path’.²

1.1. Fictive motion typology

Scholars have found fictive motion expressions fascinating because they straddle the line between literal and non-literal expressions. Questions about fictive motion expressions are asked in both the field of cognition and linguistic typology. In cognitive studies, underlying processes that motivate fictive motion hold a significant place (Talmy 1996; 2000a; Langacker 1990; Blomberg 2014). Empirical data suggests that the cognitive processes involved in these cases are dynamic. This gives rise to dynamic expressions of static objects or static states of objects (Matlock 2004; Blomberg 2014). Several motivations have been proposed for the use of motion expressions to describe extended objects. These range from the biological – human predisposition to motion (Langacker 1990; Talmy 1996; 2000a) to metaphorical reasoning (Jiménez Martínez-Losa 2007; Ma 2016) and mental simulation (Matlock 2004). Another question that has evoked some interest is whether speakers actually experience motion while using fictive motion expressions³ (Matsumoto 1996; Matlock 2004). Studies approaching the fictive motion question through a linguistic typological lens have been smaller in number (including Talmy 1996; Matsumoto 1996; Rojo and Velenzuela 2003; Taremaa 2013; Blomberg 2014; Stosic et al 2015; and Ma 2016, among others) and have mostly made use of typological classifications devised to categorize actual motion events. Through a comparative study of English and Japanese, Matsumoto (1996) proposes some very significant correlations on the use of motion verbs to describe static objects:

The Path Condition: All fictive expressions must express some property of the path of motion.

The Manner Condition: No property of the manner of motion can be expressed unless it is used to represent some correlated property of the path.
(Matsumoto 1996: 12)

² For more information on other types of fictive motion expressions, please refer to Talmy (1996; 2000a).

³ Through behavioural experiments and eye-tracking studies, Matlock came to the conclusion that the simulation of motion is a motivator of fictive motion (Matlock 2004).

Matsumoto’s study is also important for highlighting another major constraint on what can be described using non-actual motion (henceforth **NAM**) expressions (especially with special reference to Japanese). It is found that extended objects, such as roads, which allow actual human motion, also facilitate the use of NAM expressions.

The latest typological and theoretical contribution to the field is Blomberg’s hypothesis that “enactive perception” is a prime motivator for non-actual motion. This typological proposal is based on the level of dynamicity that a language allows to be encoded in a NAM expression (Blomberg 2014). For example, Blomberg’s work on Thai shows that information on manner is retained when manner verbs are used by speakers to express the velocity of movement along the objects being described (Blomberg 2014). According to Blomberg, languages may potentially express non-actual movement, non-actual motion and non-actual path. Non-actual movement includes information about velocity, and as this paper proposes, also information about body configurations while moving. Non-actual motion refers to the use of motion verbs to describe static objects. Non-actual path refers to the use of dynamic expressions through the use of prepositions, case markers, and the like, but without the use of motion verbs. Thus, a hierarchy is proposed: *non-actual path* < *non-actual motion* < *non-actual movement* (Blomberg 2014). That is, a language with non-actual movement may also have non-actual motion and non-actual path, while the reverse may not hold true. Theoretically, Blomberg’s approach differs from that of Talmy, Langacker or Matlock. He takes a phenomenological stance, which includes the role of the perceptual object in producing NAM⁴ (Blomberg 2014). The model he builds includes three motivators for NAM, with the primary one being ‘enactive motion’⁵ (Blomberg 2014; Stosic et al. 2015). Enactive motion is a mode of seeing and experiencing extended objects. This is described as the *first-person perspective* for the purpose of experiments in Blomberg’s design (Blomberg 2014). The second motivation is ‘visual scanning’. This is referred to experimentally as the *third person perspective* (Blomberg 2014). The third motivation for the use of NAM is ‘metaphors’ (Blomberg 2014).

Typological studies on NAM, which use actual motion typology to describe how languages encode extension, identify four core elements - *motion* and *path* (represented by the verb), and *figure* and *ground* (represented by the participants in a visual scene) (Talmy 1975, 2000b). It is proposed that languages may be classified as *verb-framed* or *satellite-framed* on the basis of how they structurally encode a motion event (Talmy 1985, 1996). A third-category of *equipollently framed* languages has also been proposed (Slobin 2004, 2006). Examples 2a to 2c from English (2a), Spanish (2b) and Mandarin Chinese (2c) illustrate this typology.

2a an owl flew out

2b sale un buho
exits an owl

2c fei1 chu1 lai2 yi1 zhi1 mao1tou2ying1
fly exit come one CL⁶ owl
(Slobin 2006: 4)

In this paper, we propose to explore the ways in which Khasi⁷ speakers describe extension, both in terms of Talmy’s and Slobin’s typologies. In addition, we explore the kind of manner information that Khasi allows, and attempt to locate it in Blomberg’s typology of Non-actual motion. This paper includes two

⁴ In a similar vein, it also treats languages as existing in the linguistic environment as well, instead of it being a purely mental phenomenon (Blomberg 2014).

⁵ Enactive motion is the experience of motion that arises from the “indispensable connection between visual perception and the potential for self-motion” (Blomberg 2014:173). That is, enactive motion refers to the experience of motion of static objects in NAM because of the dynamic relationship between our perception of an object that affords human motion and the way in which such an object reveals itself to us.

⁶ Slobin originally glossed zhi₁ as ‘only’ (which is zhi₃), whereas it is a classifier for animals 隻 zhi₁.

⁷ There are several varieties of Khasian languages (Diffloth 2005; Sidwell 2009; Koshy and Wahlang 2011). ‘Khasi’ as used in this paper refers only to Standard Khasi.

sections: (a) the different motivations behind the use of NAM, and, (b) the various descriptions of images given by the participants.

1.2. Khasi background and issues of spatial extension

Khasi is one of the very few Austroasiatic languages spoken outside Southeast Asia – generally considered the home of Austroasiatic languages. Khasi and other Mon-Khmer languages spoken in India are among the most poorly studied languages in the subcontinent, and therefore this study tries to fill an existing gap both in terms of a cognitive and a typological understanding of the language.

Khasi is an SVO language. It is polysynthetic and agglutinating through prefixes. Case is marked by a prefix. In terms of spatial grammar, Khasi marks Locative, Ablative and Allative cases, through affixation. It has a deictic system that marks both distance and elevation (Nagaraja 1985; Diessel 1999). This system is not surprising given that the language is spoken in a hilly terrain. The terrain in which a language is spoken has been shown to affect its spatial expressions in other languages as well (Schultze-Berndt 2006). Khasi uses a combination of elements from all three frames of references (Levinson 1996). In the relative frame of reference, it has *ka-diaŋ* – *ka-mon* ‘left-right’ coordinate points. It also has absolute frames of references *miʔ-ŋi* ‘come out-sun (East)’ and *sep-ŋi* ‘finish – sun (West)’. However, there are no words for ‘north’ or ‘south’, and the *case* + *deictic* markers for elevation are used to talk about latitudinal differences, *ha/fa-rum* “lower” and *ha/fa-neŋ* “higher”. For example, in Khasi, one could produce sentence 3 to talk about the location of Kashmir in relation to Delhi. To mark intrinsic frames of references, Khasi uses *case* + *deictic* markers.

3.	<i>ka-Kashmir</i>	<i>ka-don</i>	<i>fa-neŋ</i>	<i>joŋ</i>	<i>ka-Delhi</i>
	3FSG-Kashmir	3FSG-exist	ALL-high	GEN	3FSG-Delhi
	‘Kashmir is north of Delhi’				

Khasi also has a rich system of word formation through compounding. This process makes Khasi an interesting language for the study of NAM, because as an agglutinating language, it allows VERB + VERB compounding, among other combinations. For example, we find combinations of a deictic verb *go* with a manner verb *walk* in *leʔt-ja:ʔd* “go-walk”.

With specific reference to Khasi, this study addresses the following questions:

- How do Khasi speakers describe spatial extension, and what kind(s) of verbs do they use to express extension?
- When used in NAM expressions, do such verbs retain their manner information? What do they convey, in so far as extension is concerned?
- Are compound verbs used in NAM expressions, and do their semantics undergo any change?
- How do other linguistic elements contribute to NAM expressions? For this purpose, the paper looks into how co-events (Talmy 2000b) such as the *manner* of motion gets represented in Khasi.

In the following sections, we try to address the questions posed above.

2. Methodology

The model and stimuli material is taken from the NAM model in Blomberg (2014)⁸. For this paper, we changed the terms, *1st person* and *3rd person*, used by Blomberg to *depth-extension* and *across-extension* because the terms *1st person* and *3rd person* are potentially misleading. The experiment uses images, and it could be argued that all images are actually from a 3rd person perspective, in that they do not represent an experience of the objects in the picture themselves, but a rendering of these objects by an artist. In that sense, any viewing of a picture is a third-person experience of the objects in the picture, making these terms slightly confusing.

⁸ All stimuli materials are used with permission from Dr. Johan Blomberg.

2.1. Experiment design

The experiment involved four different types of image sets. These images are included in the appendix at the end of this paper. These image sets represent four conditions testing the role of enactive motion in NAM.

1. *Images with* [DEPTH-EXTENSION] + [AFFORD HUMAN MOTION] (DE+Aff)
2. *Images with* [ACROSS-EXTENSION] + [AFFORD HUMAN MOTION] (AE+Aff)
3. *Images with* [DEPTH-EXTENSION] - [AFFORD HUMAN MOTION] (DE-Aff)
4. *Images with* [ACROSS-EXTENSION] - [AFFORD HUMAN MOTION] (AE-Aff)

The images were also designed to test if the point of view of the participant had any effect on his/her description. To do this, a landmark (house, tree, etc) was placed on the left or right of a figure (e.g. road, fence etc.) in across-extension perspective images and at the beginning or end of a figure in depth-extension perspective images. Some images used were also designed to feature region changes (i.e., regions with an obvious boundary, for example, roads and pipes coming out of a tunnel or entering into a tunnel, etc.). The stimulus display duration was self-timed. This was followed by a blank screen, during which participants had to give a description of the images that were displayed. They were instructed to try and describe the images in a sentence, in order to avoid situations where participants simply named objects present in the image (following, Blomberg 2014). 38 images were presented to each participant: 2 practice images, 12 controls and 6 images for every test condition. The experiment design was deployed on Psychopy (Pierce 2007) using a 16-inch laptop screen.

2.2. Participants

30 people, with a mean age of 25, participated in the experiment. Every participant chosen was a native speaker of Khasi and spoke English as a second language. They were temporarily in the cities of Hyderabad and Bangalore, India as students at the time when the data was collected. They reported speaking Khasi every day on the phone or with their friends. The experiment was conducted in Hyderabad and Bangalore.

3. Quantitative analysis and results

A total of 1,140 descriptions were recorded. Each recording was transcribed into text. An initial bin count was done to check for NAM expressions in the descriptions. We follow Blomberg's and Zlatev's criteria counting "all sentences in which (minimally) a motion verb is used to denote a situation that lacks observed motion" (Blomberg and Zlatev 2014) to decide what counts as a NAM expression. Of a total of 720 test conditions, there were 315 NAM expressions, which was 44% of the total count. This tallies with the findings in Stosic et al. (2015) that "the corpus study showed a very low frequency of NAM expressions across languages". This count, however, omits descriptions of posture and placement, which were counted as separate categories. Table 1 gives the count of NAM and non-NAM expressions obtained for every condition.

Table 1: +NAM and -NAM expressions for every condition

	+NAM	-NAM
DE+Aff	94	86
AE+Aff	88	92
DE-Aff	55	125
AE-Aff	64	116

The effect of affordability of motion on the use of NAM expressions is quite visible (cf. Matsumoto 1996). 50% of objects which afford human motion are described in NAM expressions, regardless of whether they extended in depth or across the image. Objects that do not afford human motion, on the other hand, represent only 33% of the NAM expressions.

Figure 1. Effects of affordability of motion on NAM expressions usage

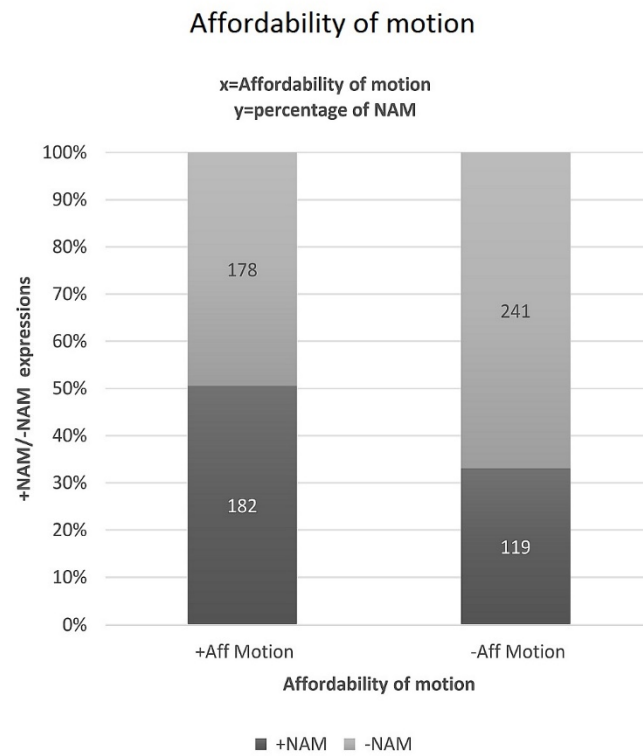


Figure 2. Effects of depth vs. across extension

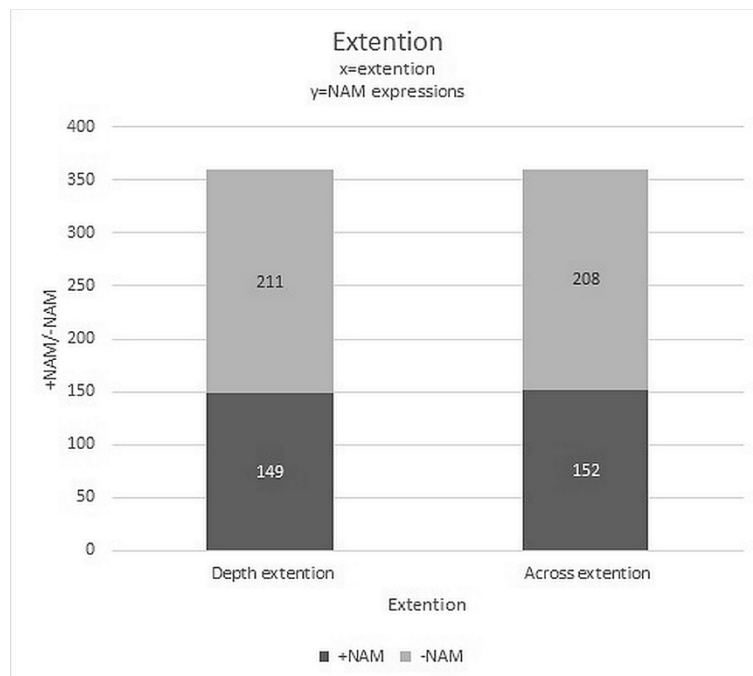
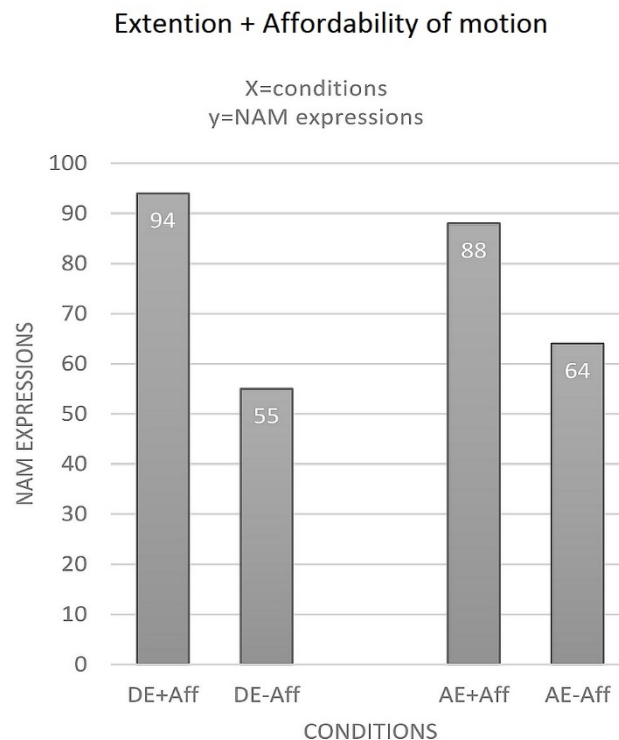


Figure 3. Effects of extension + affordability of motion



The graph in Figure 2 shows that the orientation of extension (i.e. depth versus across) by itself does not make any difference. Both conditions elicit more or less the same number of NAM expressions. However, in Figure 3, we see that the orientation of extension, when combined with the affordability of motion, gives rise to differences in the use of NAM expressions. The difference that we have in Figure 1 is partly a result of the massive difference that the property of affordability of motion makes when the object extends in depth. While this difference does exist when objects extend across images, it is not as significant. These results confirm Blomberg's hypothesis of enactive motion being a primary motivator of NAM.

4. Linguistic data

Different types of sentences elicited are included in the appendix. These sentences describe extended entities either as static objects or as objects in motion. Structurally, they are mostly sentences with relative clauses, and at times short simple sentences. These contain tokens of path-conflating, manner-conflating, path+manner, -conflating motion verbs, compound verbs as well as sentences with no verbs at all with reference made to the source and to the destination (e.g. from...to...). These sentences also illustrate the use of deictic markers, case markers and adverbs, to highlight features of the extended objects, such as their shape, direction and destination. The entire data set has not been included in the appendix, for lack of space. However, the different types of descriptions given by the participants have been adequately covered.

5. Linguistic analysis

To analyse the data, we look at the following aspects of the participants' descriptions:

- When talking about the extended property of the objects, do speakers use static terms or fictive terms or a combination of both?
- When using static terms, how do they convey extension?
- When motion expressions are used to describe these objects, we examine the ways in which the figure (the extended object) is referred to in relation to the ground(s).

While analyzing the data, we additionally look at 'boundary crossing' (sometimes referred to as 'region change'), which Slobin (1996) linked to the use of path verbs in Spanish. This was also incorporated by

Blomberg (2014) into the design of his experiment. While direction is often treated as a part of path, we differentiate between the two and treat direction as a separate element of analysis, following Zlatev and Yangklang (2004) and Blomberg (2014) and Ma (2016).

5.1. Verb types and frequency count

We begin with the details of the different verbs that are employed by the participants in expressing NAM. The NAM expressing verbs also carry agreement markings like their non-NAM counterparts. Table 2 is a list of all the verbs found in the study.

Table 2: List of verb types found in the data

Manner	Path	Direction	Cause	Path+ manner	Path+ direction	Manner +direction	Other	Total
5	7	2	1	6	2	1	2	26
<i>ja:ɟd</i> ‘walk’	<i>ka:m</i> ‘cross’	<i>leɪt</i> ‘go’	<i>(ja)-lam</i> ‘lead’	<i>ksam</i> ‘claw’	<i>wan-pɔi</i> ‘come-reach’	<i>leɪt- ja:ɟd</i> ‘go-walk’	<i>btɜŋ</i> ‘connect’/ ‘continue’	
<i>pon</i> ‘bridge’	<i>pɔi</i> ‘reach’	<i>wan</i> ‘come’		<i>sam</i> ‘pierce’	<i>wan-mi?</i> ‘come-exit’		<i>ta:n</i> ‘draw’	
<i>p^hai</i> ‘turn’	<i>ruŋ</i> ‘enter’			<i>par</i> ‘crawl’				
<i>kɜ:r</i> ‘surround’	<i>mi?</i> ‘exit’			<i>p^hruŋ</i> ‘insert’				
<i>tiŋk^hɔ?</i> ‘hit’	<i>sdaŋ</i> ‘start’			<i>ŋam</i> ‘go under’/dive’				
	<i>kut</i> ‘end’			<i>pin-pei</i> ‘cause-hole’				
	<i>ke:w</i> ‘climb’							

The list points to a very varied repertoire of verb-types used by participants. *Path* verbs dominate the set, closely followed by the set of *path + manner* conflating verbs. However, in our study's data, in terms of frequency of use, *manner* verbs and *path* verbs are amongst the most frequently used verbs in contrast to *path + manner* conflating verbs and *path + direction* verbs. Of these, although *ja:ɟd* is often used as a bleached manner verb, it is also used as a manner verb proper. We will discuss this in greater detail later. The high frequency use of a few verbs is similar to the case in English, in contrast to the more equally spread out use of verbs in Spanish, as reported in an English – Spanish study (Rojo and Venzuela 2003). This is possibly because *ja:ɟd* can be combined with a number of satellite words to express path. Table 3 gives us a glimpse of the frequency with which the verbs have been used. However, the high frequency of path-conflating verbs *mi?* and *ruŋ* is facilitated by the stimuli displayed, a topic that will be discussed in greater detail when we talk about path-conflating verbs in sections 6.3.2 and section 6.6.

Table 3: Verb frequency

Verb	Translation	Category	No. of times used
<i>ja:ɟd</i>	walk	Manner	149
<i>mi?</i>	exit	Path	49
<i>ruŋ</i>	enter	Path	40
<i>(ja)lam</i>	lead/take	cause	22

Unfortunately, there is no comparative analysis available on verbs describing kinesis to contrast this with. It will require further studies. We do, however, present some sentences describing kinesis from other Khasi texts to compare them with some of the sentences here.

Khasi also encodes spatial information about path and motion by case markers, deictic markers, prepositions and adverbs, as listed in Table 4.

Table 4: A list of satellites

	Translation	Word Category
<i>ha</i>	Locative	Case marker
<i>na</i>	Ablative	case marker
<i>/a-</i>	Allative	case marker
<i>-ne</i>	proximal	deictic marker
<i>-to</i>	Medial	deictic marker
<i>-ta</i>	Invisible	deictic marker
<i>-tey</i>	distal-up	deictic marker
<i>-neŋ</i>	High	deictic marker
<i>-lor</i>	Top	deictic marker
<i>-pɔʔ</i>	Interior	deictic marker
<i>-bar</i>	Exterior	deictic marker
<i>-duʔ</i>	End	preposition
<i>k^hmat</i>	front	preposition
<i>pdeŋ</i>	center	preposition
<i>linba</i>	through	preposition
<i>be^t</i>	straight	noun-modifier
<i>jrɔŋ</i>	Long	noun-modifier
<i>jille^w</i>	Deep	noun-modifier
<i>be^t-(be^t)</i>	straight	adverb
<i>siak</i>	straight up and precise	adverb
<i>ter-(ter)</i>	continuous and in a line	adverb
<i>pirfaʔ</i>	against	adverb
<i>ji-linter</i>	one-breadth (whole breadth)	adverb
<i>linter</i>	continuously	adverb
<i>-b^ha</i>	Very	adverb
<i>rintiʔ</i>	neat	adverb

Information about path, direction and motion is encoded not just in a singular morphological unit but through the combination of these units.

In the next section, we examine how these verbs are distributed and combined with case, deictic markers and adverbs to represent an object's spatial layout. We also compare these with structures involving kinesic. To do this, we look at the words and clauses used to describe the images: (a) images without obvious boundaries between different objects, (b) images with obvious boundaries between different objects, (for example, tunnels) and (c) the effect of how the object extends in the visual field.

6. NAM as represented in Khasi

Khasi uses motion verbs and spatial deictic categories to represent NAM. The types of verbs used include *manner-conflating verbs*, *path-conflating verbs*, *deictic verbs*, and *compound verbs*. Direction and location are expressed through case markers, prepositions, and deictic markers. In addition, path and direction are also expressed using adverbs or reduplicated structures. The compound verbs used in NAM expressions are of special interest because of the encoding of both path and manner in these verbs when describing actual motion. For example, when describing objects in kinesic, Khasi expressions like *wan-ja:ⁱd* 'come-walk', encode information about the manner of motion, speed and direction of the path. Of these, the manner and speed of motion are encoded in *ja:ⁱd* and the direction of motion towards the speaker by *wan*, a deictic verb. Another compound verb describing motion is *wan-raʔ* 'come-carry (bring)'. *wan* 'come', which has a deictic component, adds direction to the verb *raʔ*. However, *wan*, even though a deictic verb by itself, is often accompanied by explicit deictic components like *p^hai* as in *wan-p^hai* 'come-turn (return in the direction of the speaker or hearer)'. This is in contrast to the expression *le^t-p^hai* 'go-turn' (return in the direction away

from the speaker or hearer). While these and other compound verbs are expected to be found in the descriptions of NAM, it is important to investigate if NAM contexts lead to any change in the semantics of the verbs.⁹

6.1. Description of object properties

When describing properties of objects, like being *straight* or *extended*, modifiers like *jrɔŋ* ‘long/tall’ and *be’t* ‘straight/directly’ are used. We see these in descriptions exemplified in (3) and (7), which are both constructed in relative clauses. Images presented are often described with relative clauses and not with short simple sentences containing attributive adjectives. This is in conformity with the general Khasi pattern where modifiers of nouns (including relative clauses, numerals, adjectives, etc.) appear post-nominally. These modifiers are introduced by a relativizing particle *ba-*, which links them to the preceding nominal by carrying the gender marker of the noun as illustrated below.

4 *ka-k^hinnaʔ* *ka-ba-jrɔŋ*
3FSG-child 3FSG-REL-tall
‘The child who is tall, or, the tall child’

5 *ka-jen* *ka-ba-rim*
3FSG-house 3FSG-REL-old
‘The house that is old, or, the old house’

6.2 Static descriptions

Khasi speakers do not use NAM expressions at all times, even when there is a potential to use one. In such cases, we find simple static descriptions of the objects. This results in an enumeration, presenting a general layout of the objects in view, as in sentences 6a and b, and 7a and b.

6a *Don* *ar-tilli* *ki-jjŋ-k^haŋ-jit* *i-jen* *ba-rit*
Exist two-NON.HUM.CL 3PL-NMZ-close-glass 3DIM-house REL-small
‘There are two windows, a house that is small,

6b *i-we^y* *i-jjŋ-k^haŋ* *ki-phlay* *bad* *ka-linti-jad*
3DIM-one 3DIM-NON-close 3PL-grass and 3FSG-path-walk
one door, grass and a path’.

7a *Ka-linti* *ka-ba- be’t* *bad* *ha-rud* *joŋ-ka-ne-ka-linti*
3FSG-path 3FSG-REL-straight and LOC-side GEN-3FSG-PROX-3FSG-path
‘A straight path and on the side of this road there are two trees and two stones’.

7b *ki-don* *ar-tilli* *ki-deŋ* *bad* *ar-tilli* *ki-maw*
exist two- 3PL-tree and two- NON.HUM.CL 3PL-stone
NON.HUM.CL
‘A straight path and on the side of this road there are two trees and two stones’.

The layout is presented using spatial relations like the locative case maker *ha-* in combination with location words like *-pdeŋ* ‘center’, *-rud* ‘side’, and the like. Such descriptions do not involve the case markers *na* and *ʃa*, the ABLATIVE and ALLATIVE markers, which are only used when the event is visualized as involving motion.

⁹ It is reported, for example, that serial verbs in Thai when used in NAM, conflate both path/direction and manner (Blomberg 2014). Languages which exhibit such conflation are labelled equipollently-framed languages (Slobin 2006).

6.3. Motion verbs

The most important aspect of studying NAM is with respect to the kind of verbs used. We find that NAM is represented using *path-conflating* verbs, *manner-conflating* verbs, *compound* verbs (with a deictic component) and *Path and manner* conflating verbs.

6.3.1. Manner conflating verbs

NAM expressions involve different kinds of manner conflating verbs. *jaːd* ‘walk’, *jalām* ‘lead’, *kʰun* ‘turn’, and *leːt* ‘go’ are some of them. When extended objects begin or end with a landmark (see DE+Aff, image 1 in the appendix), the verbs most frequently used are *jaːd* ‘walk’, *jalām* ‘lead’ and *leːt* ‘go’ along with *pɔi* ‘reach’, a path conflating verb. Consider sentence 8 as an example.

8	<i>ŋa-joʔi</i>	<i>ka-wei</i>	<i>ka-linti</i>	<i>ba-</i>	<i>jaːd</i>	<i>ʃa-jen</i>
	1SG-see	3FSG-one	3FSG-path	REL	walk	ALL-house
	‘I see a path that walks to a house.’					

In 8, extension is encoded in the verb and the direction of extension is encoded in the ALLATIVE case marker *ʃa*, marked on the landmark, *jen* ‘house’. If the extended object does not end in a landmark and changes boundary (e.g., roads with tunnels, roads running into forests, etc.), the change in boundary is expressed through manner conflating verbs with *case* + *deictic* markers/prepositions.

9	<i>u-paːt</i>	<i>u-ba</i>	<i>jaːd</i>	<i>beːt - beːt</i>	<i>ʃa-bar</i>	<i>na-krem</i>	<i>ʃa-bar</i>
	3MSG-pipe	3MSG-REL	walk	straight-straight	ALL-EXTERIOR	ABL-cave	ABL-outside
	‘A pipe which walks very straight to the outside, from the cave to the outside...’						

A change in boundary is not always expressed by case + deictic markers as in sentence 9. Extension through a region, when the image has more than one region, is also expressed by manner verbs that appear along with *liŋba* ‘through’. The telic component (cf: Zwarts 2008) in *liŋba*, encodes information about the object having a path that also includes a particular region.

10	<i>ka-linti</i>	<i>(ka)-ba</i>	<i>jaːd</i>	<i>liŋba-ka- tʌnəl</i>
	3FSG-way	3FSG-REL	walk	through-3FSG-tunnel
	‘A path that walks through a tunnel.’			

In most of its usage in a NAM expression, *jaːd* ‘walk’ is bleached of its manner or speed information.¹⁰ This is in consonance with Matsumoto’s Manner condition, according to which manner of motion can be used only if it is used to express a property of the path. However, this Manner condition fails to hold in situations where *jaːd* is used along with other verbs, as in sentences 11a and 11b.

11a	<i>u-pait- um</i>	<i>u- jaːd</i>	<i>liŋba</i>	<i>u-lum- baʔ</i>	<i>bad</i>	<i>u-ksam</i>
	3MSG-pipe-water	3MSG-walk	through	3PL-mountain-big	CONJ	3PL-claw
	‘A water pipe walks through a big mountain and claws					

11b	<i>liŋba</i>	<i>u-lom</i>
	through	3MSG-mountain
	through the mountain.’	

In 11, *jaːd* retains the velocity information when it is used along with *ksam* ‘claw’, a path and manner conflating verb. *jaːd* also retains manner information when it appears in a compound verb with a deictic verb. This is discussed in greater detail in the section on compound verbs.

¹⁰ The word *jaːd* is also used in other domains like representing the passage of time (displacement).

6.3.2. Path conflating verbs

NAM expressions involve different kinds of path conflating verbs. These include, *pɔi* ‘reach’, *ruŋ* ‘enter’, *mi?* ‘exit’, *sdaŋ* ‘start’ and ‘*kut*’ ‘end’, among others. These verbs are often followed by the case markers *fa*, *na* and *ha*, and optionally, a deictic marker. *ruŋ*, *pɔi* and *kut* being path-encoding verbs should not necessarily have to be followed by a directional case marker. However, these verbs primarily express a change in region or a crossing of boundaries and are, therefore, often accompanied by deictic markers *pɔ?* ‘INTERIOR’ and *ba* ‘EXTERIOR’, which appear along with the case markers.

- 12a *ka-surɔk* *(ka)-ba* *ruŋ* *fa-pɔ?-ka-tɔnəl*
3FSG-road 3FSG-REL enter ALL-INTERIOR-3FSG-tunnel
‘A road that enters into a tunnel;
- 12b *ŋi* *ŋi-peit* *ja-ka-ne* *ka-surɔk* *na-pdeŋ-ɔŋ-ka*
3PL 3PL-look ACC-3FSG-PROX 3FSG-road ABL-centre-GEN-3FSG
we are looking at this road from its center.’
- 13 *ka-ruŋ* *fa-ka-tunnel*¹¹ *(ka)-ba* *jille*^w
3FSG-enter ALL-3FSG-tunnel 3FSG-REL Deep
‘It enters into a tunnel which is deep.’

These examples also explicitly state the way in which the object extends (i.e. the object extends into the picture). However, in section 6.6, we will look at how path-conflating verbs are used to express the direction of extension of an object. In most cases, path conflating verbs are used in situations that feature a change of region or a crossing of boundaries. This is in accordance with Slobin (1996), who proposes this to be the motivation for the use of path-conflating verbs in any language.

6.3.3. Path and manner conflating verbs

In Khasi, path and manner conflating verbs include, *p^hruŋ* ‘push-in/insert’, *ksam* ‘claw’, *sam* ‘pierce’, *tiŋk^hɔ?* ‘hit’ and *ŋam* ‘go under/dive’. These verbs are used when describing changes in region. *p^hruŋ* is a manner and path encoding verb. It describes a digging or penetrating action of the pipe into the earth, away from the speaker. As a path conflating verb, it does not require a directional case marker. *p^hruŋ* is usually followed by *ha-pɔ?* ‘inside’, *na-filian*...*fa-filian* ‘from-one side...to-one side’ or *liŋba* ‘through’. Similar verbs, conflating manner with path, are reported in French and Thai as well (Blomberg 2014). Another verb representing a digging action into the earth is *sam* ‘pierce’. *sam* is always followed by *liŋba*, which provides the path information. Another path and manner conflating verb used in NAM expressions in Khasi is *pon*¹² ‘bridge over’, expressing the middle section of a path.

- 14 *u-paip* *u-ba* *p^hruŋ* *ha-pɔ?-k^hində*^w
3MSG-pipe 3MSG-REL Insert LOC-INTERIOR-earth
‘A pipe that inserts into the earth.’
- 15 *ki-tillɔŋ-um* *ki-ba* *sam* *liŋba* *ki-ma*^w
3PL-source-water 3PL-REL pierce through 3PL-stone
‘The water sources that pierce through the stones.’

It is important to note here that path and manner conflating verbs in Khasi retain information about the manner of motion. *p^hruŋ*, *sam* and *ksam* retain information about how the boundaries meet physically. *ja:ⁱd*,

¹¹ In the Khasi hills there are no tunnels, despite the region being largely hilly or mountainous. Participants either used the borrowed word ‘tunnel’ or used the word equivalent for ‘hole’ or ‘cave’.

¹² The word *pon* might not have the same corresponding meaning ‘bridge over’ (Singh (1960); Kharkongor (1968)) in actual motion, except as a metaphor.

when used with *ksam*, retains information on the velocity with which the two objects meet, while *pon* bridges or connects two regions without the involvement of any motion.

6.4. Compound verbs

As briefly mentioned earlier, Khasi also uses compound verbs to represent objects in kinesis, as is demonstrated in sentence 16.

- 16 ...*ki-la-ju-wan-hiar* *fa* *ka-pirt^hei* *ban-rep* *ban-riang*
 they-PST-HAB-go-descend to 3FSG-earth INF-cultivate INF-imi
 ‘They used to go down to earth in order to cultivate.’
 (Rabel 1961:149)

While Rabel (1961) classifies *wan-hiar* as part of a serial-verb construction, it is treated as a compound verb here¹³. In *wan-hiar*, the verb *wan* provides the information on direction. The people descending are seen as coming towards the earth. The descent is towards the direction of the people speaking these lines.

It is also important to note here that compound verbs are not very commonly used in these structures. Some of the compound verbs used include, *le^t - ja:^jd* ‘go-walk’, *wan-mi?* ‘come-exit’ and *wan-pɔi* ‘come-reach’. All these verbs have a deictic verb and a path or manner verb. The compounds are all left-headed, and both members are semantically transparent. In this context, motion and direction are conceptualized through the deictic verb, and the information about path or manner, or path and manner is conveyed through the head verb.

- 17 *ka-linti* *ka-ba* *le^t - ja:^jd* *ka-ba* *tiŋ-k^ho?* *ha-k^hmat-jiŋ-k^haŋ*
 3FSG-trail 3FSG-REL go-walk 3FSG-REL hit LOC-front-NMZ-close
 ‘A trail that goes-walks hitting the front of the door.’

In the case of *le^t - ja:^jd*, *ja:^jd* occurring in a compound verb retains its information about manner, as it would if it were used in an actual motion context. The usage of ‘go’ and ‘come’ gives us the information about the direction of the action from the participant’s point of view. The compounded verb forms used include *wan-pɔi* and *wan-mi?*.

6.5. Adverbs

Information about path is also encoded in Khasi by adverbs. These include, *be^t - be^t* ‘straight–straight (very straight)’, *stət* ‘quickly’, *siak* ‘straight and precise’ and *ter-ter* ‘neatly in a sequence without ending’. Consider sentences 18 and 19.

- 18 *ka-wei-ka-linti* *na-ka-yeŋ* *ka-ba* *jalām* *be^t - be^t* *naŋ-ta¹⁴*
 3FSG-one-3FSG-path ABL-3FSG-house 3FSG-REL lead straight-straight ABL-there
 ‘A path from the house that leads straight-straight from there.’
 19 *ka-wei-ka-linti* *ka-ba* *ja:^jd* *siak,* *tiŋk^ho?* *ha-k^hmat* *jiŋ-k^haŋ*
 3FSG-one-3FSG-path 3FSG-REL walk straight on hit ALL-front NMZ-close
 ‘A path that walks straight on, hits the front of the door.’

The expression *ja:^jd siak* ‘walk straight’, for example, is used to visualize the precision in straightness of the road, before it hits the front of the door. Interestingly, the use of such adverbs may also allow the use

¹³ The form *wan-hiar* ‘come descend’ takes inflections only on *wan*. *wan* is the light verb that adds direction to the verb *hiar*, while the meaning of the whole expression remains ‘descend’.

¹⁴ The suffix *-ta* is a deictic marker that refers to the location mentioned earlier, in this case the house.

of certain verbs like *tiŋk^ho?* ‘hit’ encoding manner. That is, if the road is not expressed as being very straight and directed, this verb may not be used.

It is also interesting to contrast expressions representing NAM with those representing kinesis. Adverbs, for example, are often used to reveal more about the manner, speed and/or path of the motion. When manner is not specified by the verb, Khasi deploys a rich system of adverbs which provide the necessary information about manner¹⁵. In the following example, we have two adverbs, *soʔt* ‘at once and leaving behind’ and a reduplication of the adverb *beʔt*. The adverb *beʔt* (*-beʔt*) ‘straight’ represents the temporality of the path and not the actual direction. It signifies that the tiger went to the outskirts of the village without stopping anywhere in between.

- 20a *u-k^hla* *u-la-mi?* *soʔt* *bad*
3MSG-tiger 3MSG-PAST-exit at once, leaving behind CONJ
‘The tiger left at once and
- 20b *u-la-mare?* *beʔt-beʔt* *ʃa-rud-non*
3MSG-PAST-run straight-straight ALL-outskirt-village
ran straight to the outskirts of the village.’
(Ellas, H 1972:34)

It is difficult to list here, all the different adverbs used to qualify motion verbs in Khasi. The *Khasi – English dictionary* (Bars 1973) lists about a hundred adverbs ¹⁶(including reduplicated adverbs) that can appear along with *ja:ʔd*. A study of kinesis could shed light on the intricate differences in Khasi *manner* and *path* encoding adverbs not used in NAM expressions. Having said that, we find that these adverbs are also used in the domain of NAM to describe the way in which the movement of these objects is experienced. Adverbs like *beʔt* ‘straight’ can be used either to describe the shape of the path or the shape of the destination of the path and not the path itself. Given that extended objects like pipes occupy multiple locations and can have varying backgrounds, an expression like *beʔt - beʔt* does not simply tell us about the path, but of the destination. This is similar to sentences like ‘This road goes straight to the airport’, which does not necessarily mean that the road is straight, but that it doesn’t fork into multiple destinations.

The adverbial *ter* ‘in a sequence’ can be reduplicated to form *ter-ter* ‘consecutively’. *ter-ter* is defined as “*ryntih bad khlemsangeh*” (Kharkongor 1968), which translates to ‘neatly in a sequence without ending’. *ter-ter* tells us that the fence continues sequentially and also that it is a long fence, whose end is not visible. Consider sentence 21.

- 21 *ka-jiŋ-ker* *ka-sdaŋ* *na-u-deŋ* *ka-ja:ʔd* *ter-ter*
3FSG-NMZ-fence 3FSG-start ABL-3MSG-tree 3FSG-walk in a sequence
‘A fence starts from a tree, goes consecutively (on and on).’

6.6. Point of view and the uses of *ruŋ*, *mi?*

Apart from encoding NAM expressions, one of the basic uses of the *entry* and *exit* verbs is also to express the point of view of the speaker. This is also noted in the case of the use of compound verbs with deictic

¹⁵ Adverbs in Khasi are often formed through a process of reduplication and are a part of the class of words that scholars also classify as “expressives” (Diffloth, 1979). Expressives are a class of words whose semantics are formed phonoaesthetically and one of the ways of forming them is through iconicity. Austroasiatic languages, which includes Khasi are prolific in their use (Diffloth 1979).

¹⁶ Some of the reduplicated adverbs were entered as verbs, e.g. *ja:ʔd-kyik-kyik* “to walk as if on pins” and were treated as different ways of walking.

components¹⁷. Both *mi?* “exit” and *ruŋ* “enter” are used to describe changes in region or crossing of boundaries by an object¹⁸. While the use of the entry and exit verbs are not restricted to a first-person point of view, the structures elicited have ended up elucidating the visual position taken by the participant, whenever the object extended in depth. This allows us to tell whether the participants placing themselves within the picture in an angle which looks into or outwards from the tunnel. For example, when images depict a change of region from *within a tunnel to the outside*, the preferred NAM verb is *mi?*. When the verb *mi?* is used, one understands that the point of view used is of the speaker from within the tunnel looking at a road going outside. The entry verb “*ruŋ*” is used in the opposite direction when compared to *mi?*, to describe images with objects crossing boundaries from the *outside to the inside* of a tunnel. The placement of the tunnel on the right or the left end of the image makes no difference in the verb used.

Deictic verbs *le^yt* “go” and *wan* “come” are also used for changes in boundaries and for landmarks. However, there is not enough evidence in the data to demonstrate any preference for the direction of scanning. Sentence 22 illustrates this.

- 22a *na-ka-ne-ka- baranda* ***ka-mi?*** *ka-linti- ja:^jd* *ka-ba-n* *le^jt*
ABL-3FSG-PROX-3FSG-veranda 3FSG-exit 3FSG-path-walk 3FSG-REL-FUT go
‘From this veranda exits a walking-path that will go
- 22b */a-(pause)* *ka-ba-n* ***mi?***
ALL 3FSG-REL-FUT exit
to..., that will exit.’

While exit and entry verbs are very strongly correlated to the direction of extension that the participant assumes, we also find that participants prefer the use of */a*, the ALLATIVE case marker in combination with *ja:^jd* “walk” for images with depth extension. There is a general assumption of extension as going into the image and not towards the speaker.

With images involving ACROSS-EXTENSION, there seems to be no preference for the direction of the gaze with the gaze being guided by the position of the landmark, with the extension ending at the landmark, expressed through the use of a verb + ALLATIVE case marker.

In the cases listed above, we have deduced deictic information about the speaker’s point of view through the path verbs and the compound verbs they use with a deictic component. In the next section, we look at the importance of deictic case markers in the presentation of spatial organization and processing in Khasi.

6.7. Deictic markers

Deictic markers are used particularly when expressing changes in boundaries. They are bound and always appear with case markers or [gender + number] agreement markers as in *ka-ne* ‘3FSG-PROX’. The shape of the agreement marker on the deictic expression depends on the morphological gender of the nominal it modifies.

Khasi has a very rich system of deictic markers. Apart from the usual categories like PROXIMAL and DISTAL, Khasi also recognizes a rare deictic category of REGION-INTERIOR. Khasi forms like */a-rum* ‘to the lower part of X’, *na-rum* ‘from the lower part of X’, and *ha-rum* ‘in the lower part of X’ represent this deictic category. *-rum*¹⁹ is used when spatially locating an object on a point of a slope. This deictic marker

¹⁷ It is to be noted that deictic markers in Khasi do not appear as independent forms, and appear only with case or agreement markers, except in the case of deictic verbs.

¹⁸ In the study, *mi?* is used by one speaker for an image that involved no change of boundary. The speaker thought of the trees depicted in the image as a forest and looked at the trees as a destination (creating a change of boundary scenario) instead of viewing it as the path coming towards the verandah.

¹⁹ The form *rum* is a clipped form of *k^hrum* which translates to ‘the space under the floor/cellar’ (Singh 1906). Like *pɔ?*, *rum* can also appear as an independent morpheme, when appearing with a case marker. It can also be grammaticalised and bound. This is also a metaphorical mapping: the usual meaning ‘under the house’ mapped onto a lower point on a slope.

differs from *-t^he* ‘down there’ in *u-t^he* ‘the male down there’ or *fa-t^he* ‘to the place down there’ (Diessel 1999). *-t^he* has the features [+distant], [+down], while *rum* is [+lower]. In sentence 23 involving multiple deictic markers, we have a fence that is described as going from land into the water. It is described using a series of case and deictic markers. The change of boundary is expressed by a combination of case markers. The case markers, *naŋ-ne*, ‘from here’, *fa-tei* ‘to distance’ and *fa-pɔʔ* ‘to inside’ are used to convey a sense of continuity.

23	(...)	<i>naŋ-ne</i>	<i>fa-tei</i>	<i>fa-pɔʔ</i>	<i>ka-um</i>
		ABL-PROX	ALL-DIST	ALL-INTERIOR	3FSG-water
		from here to there into the water			

Changes in regions or a crossing of boundaries, when expressed by non-path verbs, is achieved through the use of case and deictic markers.

6.8. Non-actual path

Sometimes dynamicity or continuity is not expressed with motion verbs but with other words and phrases. A sentence like ‘*this road continues all the way to the coast*’ conveys a sense of motion even in the absence of motion verbs. Blomberg (2014) categorizes these as *non-actual path*. In Khasi, we see such structures with the verbless sentences describing a bridge. The continuity is expressed through case markers *na...fa* and the kinetic information they provide gives such structures a sense of dynamicity. Similarly, the use of the form *sdaŋ...kut* ‘start...end’ describes the event/action/process to have had a beginning and an end, giving the description as a whole a sense of continuity. The use of the verb *bteŋ* ‘continue’, similarly, provides a sense of a process or an action that has started but not ended even though it is not a motion verb. Consider sentences 24a, 24b and 25.

24a	... <i>ki-jiŋ-ker</i>	<i>ki-ba</i>	<i>sdaŋ</i>	<i>na-u-ne-u-deŋ</i>
	...3PL-NMZ-fence	3PL-REL	start	LOC-3MSG-PROX-3MSG-tree
	‘Fences that start from this tree			

24b	<i>ha-duʔ</i>	<i>ba</i>	<i>kut</i>	<i>fi-linter</i>	<i>ɔŋ-ka-ne-ka-madan</i>
	LOC-till	REL	end	one-breadth	GEN-3MSG-PROX-3FSG-ground
	till the end, the whole breadth of the ground...				

25	<i>ka-jiŋ-keŋ</i>	<i>ka-ba</i>	<i>na-fi-lian</i>	<i>lom</i>	<i>fa-fi-lian</i>	<i>lom</i>
	3FSG-NMZ-sling	3FSG-REL	ABL-one-side	hill	ALL-one-side	hill
	‘A bridge from one side of a hill to a side of another hill...’					

6.9. Metaphorical descriptions or manner verbs

An interesting verb that appears only occasionally in this study, is *par* ‘crawl.’ It is used in describing contexts involving tunnels. Used as noun, it stands for a ‘mine’ (tunnel). Though it looks similar to the noun-verb conversion pairs found in Munda languages like Mundari and Santali, these are only occasional in Khasi. It is to be noted that the use of *par* does not describe the velocity of movement, but the way in which a body must configure itself to go into holes or caves.

actual movement would have non-actual movement and path as well, applies to Khasi as well, giving us the following schemata:

Non-actual path > Non-actual motion > Non-actual movement

Verbs like *par* ‘crawl’ point to the variations in the types of manner information that languages encode in NAM, a point made by other scholars as well (Rojo and Velenzuela 2003; Blomberg 2014). It would be interesting to systematically explore further the types of manner information that are allowed by different languages in representing NAM expressions.

To simplify and categorize Khasi into a Satellite-framed or Verb-framed language, or even as an equipollent language, is difficult, and we find that speakers produce verbs in ways that suit the stimuli, using path-conflating verbs very often when talking about changes in boundary. However, due to the propensity for the use of the bleached verb *jaʔd* + Satellite, we can say that Khasi behaves very similar to a satellite-framed language, even if it has equipollent verbs.

Abbreviations

1SG	First person, singular
3FSG	Third person, feminine, singular
3MSG	Third person, masculine, singular
3PL	Third person, plural
1PA	1 st person+afford motion
1PNA	1 st person-afford motion
3PA	3 rd person+afford motion
3PNA	3 rd person-afford motion
ABL	Ablative
ACC	Accusative
ALL	Allative
CL	Classifier
CONJ	Conjunction
DEI	Deictic
DIM	Diminutive
DIST	Distal
FUT	Future
GEN	Genitive
HAB	Habitatual
IMI	Imitative
INF	Infinitive
EXTERIOR	Region-exterior
INTERIOR	Region-interior
INVISIBLE	Invisible (deictic)
LOC	Locative
NMZ	Nominaliser
NON.HUM	Non-Human
PROX	Proximal
PST	Past
REL	Relativiser

APPENDIX

Figure 1. DE+Aff (Objects that extend in depth and that afford human motion)

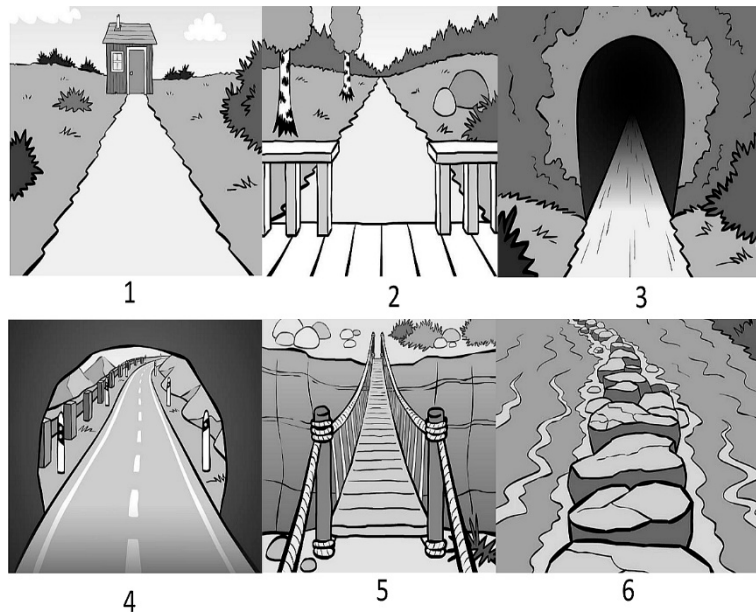


Figure 2. DE-Aff (Objects that extend in depth and that do not afford human motion)

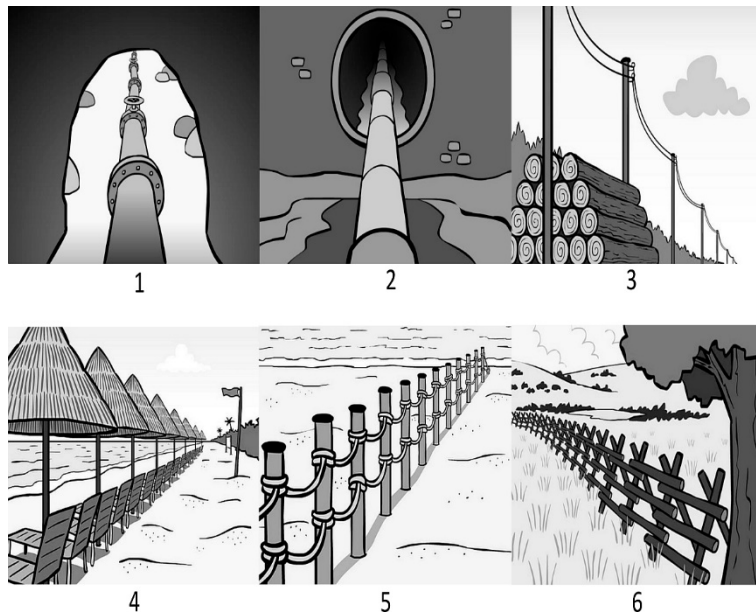


Figure 3. AE+Aff (Objects that extend across and that afford human motion)

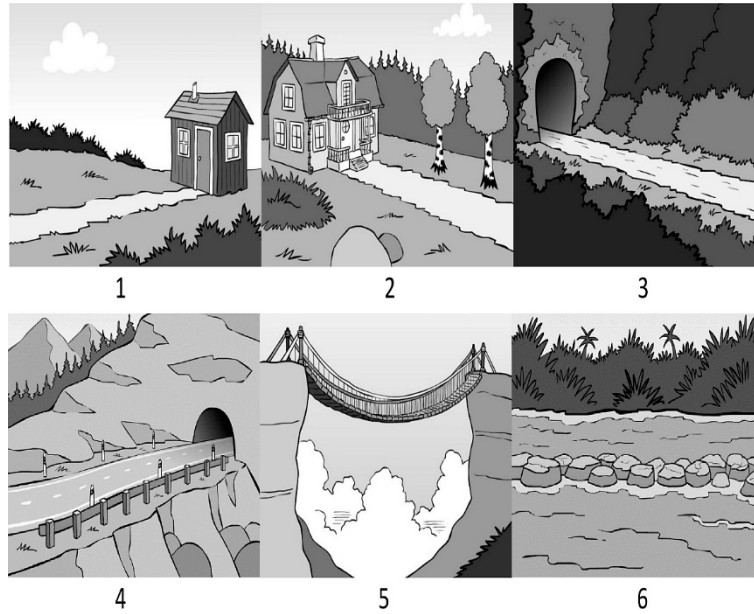
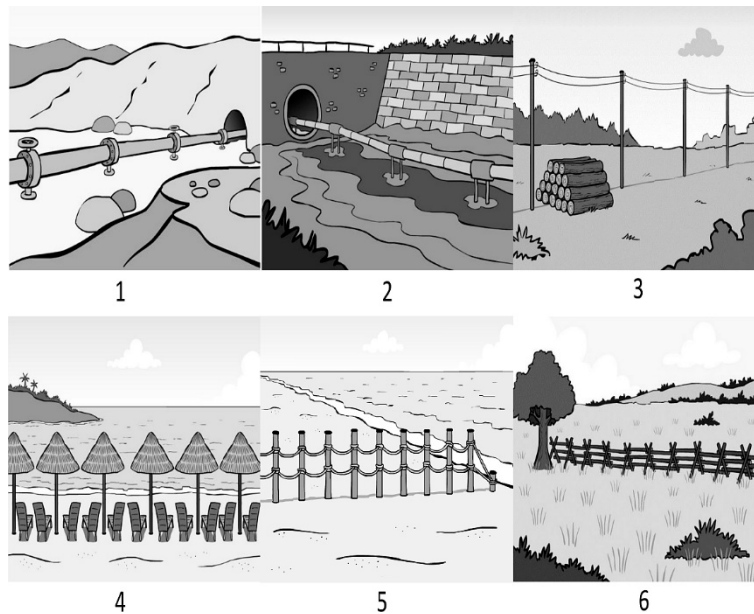


Figure 4. AE-Aff (Objects that extend across and that do not afford human motion)



Linguistic data:

1	<i>ŋa-joʔi</i>	<i>ka-wei</i>	<i>ka-linti</i>	<i>ba-</i>	<i>jaːd</i>	<i>fa-jeŋ</i>	
	1SG-see	3FSG-one	3FSG-path	REL	walk	ALL-house	
	'I see a path that walks to a house.'						(DE+Aff, image 1)
2	<i>ŋa-joʔi</i>	<i>ka-wei</i>	<i>ka-linti</i>	<i>ba-</i>	<i>jaːd</i>	<i>stət</i>	<i>fa-jeŋ</i>
	1SG-see	3FSG-one	3FSG-path	REL	walk	quickl	ALL-house
	'I see a path that walks quickly to a house.'						y (DE+Aff, image 1)
3a	<i>Ka-linti</i>	<i>ka-ba- beʔt</i>	<i>bad</i>	<i>ha-rud</i>	<i>joŋ-ka-ne-ka-linti</i>		

- 3FSG-path 3FSG-REL-straight and LOC-side GEN-3FSG-PROX-3FSG-path
- 3b *ki-don* *ar-tilli* *ki-deŋ* *bad* *artilli* *ki-maw*
 exist two- NON.HUM.CL 3PL-tree and two-num 3PL-stone
 'there are two trees and two stones.'
 (DE+Aff, image 2)
- 4 *ka-wei-ka-linti* *na-ka-yey* *ka-ba* ***jalam*** *be't- be't* *naŋ-ta*
 3FSG-one-3FSG- ABL-3FSG-house 3FSG-REL lead straight-straight ABL-there
 path
 'A path from the house that leads straight-straight from there.'
 (DE+Aff, image 2)
- 5a *ka-linti* *ka-lɔŋ* *ka-ba* *be't* *bad*
 3FSG-path 3FSG-is 3FSG- REL straight CONJ
 'A path which is straight and
- 5b *ka-ba* ***jalam*** *fa-pɔʔ-ka-jaka* *ba* *i-kʰlaʷ*
 3FSG- REL lead ALL-INTERIOR-3FSG-place REL seem-forest
 which leads into a place that is forest-like...'
 (DE+Aff, image 2)
- 6 *ŋa-jɔʔi* *ka-linti* *(ka)-ba* *ɣrɔŋ* *(ka)-ba* ***pɔi*** *fa-jeŋ- breʷ*
 1SG-see 3FSG-path (3FSG)- long (3FSG)- reach ALL-house-person
 REL REL
 'I see a path that is long, that reaches to a house of a person.'
 (DE+Aff, image 2)
- 7a *na-ka-ne-ka- baranda* ***ka-miʔ*** *ka-linti- ja:ʔd*
 ABL-3FSG-PROX-3FSG-veranda 3FSG-exit 3FSG-path-walk
 'From this veranda exits a walking-path
- 7b *ka-ba-n* *le't* *fa-(pause)* *ka-ba-n* ***miʔ***
 3FSG-REL-FUT go ALL 3FSG-REL- exit
 FUT
 that will go to.., that will exit.'
 (DE+Aff, image 2)
- 8a *ka-surɔk* *(ka)-ba* ***ruŋ*** *fa-pɔʔ-ka- tɔnəl*
 3FSG-road 3FSG-REL enter ALL-INTERIOR-3FSG-tunnel
 'A road that enters into a tunnel;
- 8b *ŋi* *ŋi-peit* *ja-ka-ne* *ka-surɔk* *na-pdeŋ-ɣɔŋ-ka*
 3PL 3PL-look ACC-3FSG-PROX 3FSG-road ABL-centre-GEN-3FSG
 we are looking at this road from its center.'
 (DE+Aff, image 3)
- 9 *ka-ruŋ* *fa-ka-tɔnəl* *(ka)-ba* *jilleʷ*
 3FSG-enter ALL-3FSG-tunnel 3FSG- deep
 REL
 'It enters into a tunnel which is deep.'
 (DE+Aff, image 3)
- 10 *ka-linti* *(ka)-ba* ***ja:ʔd*** *liŋba-ka- tɔnəl*
 3FSG-way 3FSG-REL walk through-3FSG-tunnel
 'A path that walks through a tunnel.'
 (DE+Aff, image 3)
- 11a *ka-dɔn* *ka-surɔk* *(ka)-ba* ***miʔ***
 3FSG-exist 3FSG-road 3FSG-REL exit
 'There is a road that exits
- 11b *na- ka- krem* *(ka)-ba* ***kʰun*** *fa-ka-mɔn*
 ABL-3FSG-cave 3FSG-REL turn ALL -3FSG-right

from a cave that turns to the right.’ (DE+Aff, image 4)

- 12 *ka-surək* *ka-ba* ***wan-mi?*** *liŋba-u-wei* *u-lom*
 3FSG-road 3FSG-REL come-exit through-3MSG-one 3MSG-hill
 ‘A road that comes exiting through a hill.’ (DE+Aff, image 4)

- 13 *ka-jiŋ-keŋ* *ka-ba* *na-fi-lian* *lom* *fa-fi-lian* *lom*
 3FSG-NMZ-sling 3FSG-REL ABL-one-side hill ALL-one-side hill
 ‘A bridge from one side of a hill to a side of another hill...’ (DE+Aff, image 5)

- 14 *u-pa^yt* *u-ba* ***ja:ʔd*** *be^t - be^t* *fa-bar* *na-krem* *fa-bar*
 3MSG- 3MSG-REL walk straight- ALL-EXTERIOR ABL-cave ABL-outside
 pipe straight
 ‘A pipe which walks very straight to the outside, from the cave to the outside...’ (DE-Aff, image 1)

- 15 *u-paip* *u-ba* ***p^hruŋ*** *ha-pɔʔ-k^hində^w*
 3MSG-pipe 3MSG-REL Insert LOC-INTERIOR-earth
 ‘A pipe that inserts into the earth.’ (DE-Aff, image 1)

- 16 *ki-tillɔŋ-um* *ki-ba* ***sam*** *liŋba* *ki-ma^w*
 3PL-source-water 3PL-REL pierce through 3PL-stone
 ‘The water sources that pierce through the stones.’ (DE-Aff, image 1)

- 17a *u-paip* *u-ba-* ***ruŋ*** *ha-pdeŋ* *ka-wei* *ka -t^hle^w*
 3MSG- 3MSG-REL ente LOC-center 3FSG-one 3FSG-hole
 pipe
 ‘A pipe that enters in the center (of) one hole

- 17b *bad* *u-ta- u-paip* *u- ja:ʔd* *fa-k^hmat*
 CONJ 3MSG-INV-3MSG-pipe 3MSG-walk ALL-front
 and that pipe walks forward’ (DE-Aff, image 2)

- 18 *u-wei* *u-paip* ***u-ruŋ*** *fa-pɔʔ-krem*
 3MSG-one 3MSG-pipe 3MSG-enter ALL-INTERIOR-cave
 ‘One pipe enters into a cave.’ (DE-Aff, image 2)

- 19 *ka-fens* *ka-ba* ***ja:ʔd*** *nan-ne fa-tei-fa-pɔʔ- ka-um*
 3FSG- 3FSG-REL walk ABL-PROX ALL-DIST-ALL-INTERIOR-3FSG-water
 fence
 ‘A fence that walks from here to there into the water.’ (DE-Aff, image 5)

- 20 *...ha- k^hmat* *u-ta-u lom* *dɔn* *ki-jiŋ-ker* *ki-ba* ***wan-pɔi*** *fa-k^hmat...*
 LOC- 3MSG-INV-3MSG-hill exist 3PL-NMZ- 3PL- come-reach ALL-front
 front fence REL
 ‘In front of that hill, there are fences that come reaching to the front.’ (DE-Aff, image 6)

- 21a *...ki-jiŋ-ker* *ki-ba* *sdaŋ* *na-u-ne-u-deŋ*
 ...3PL-NMZ-fence 3PL-REL start LOC-3MSG-PROX-3MSG-tree
 ‘Fences that start from this tree

- 21b *ha-du?* *ba* *kut* *fi-linter* *ɔŋ-ka-ne-ka-madan*
 LOC-till REL end one- GEN-3MSG-PROX-3FSG-
 breadth ground

‘till the end, the whole breadth of the ground...’ (DE-Aff, image 6)

- 22 *ka-wei-ka-linti* *ka-ba* ***ja:ɟ*** *siak*, *tiŋk* *ha-k^hmat* *jiŋ-k^haŋ*
^{ho?}
 3FSG-one-3FSG-path 3FSG-REL walk straight on hit ALL-front NMZ-close
 ‘A path that walks straight on, hits the front of the door.’ (AE+Aff, image 1)
- 23a *Don* *ar-tilli* *ki-jiŋ-k^haŋ-jit* *i-jeŋ* *ba-rit*
 Exist Two- NON.HUM.CL 3PL-NMZ-close-glass 3DIM-house REL-small
 ‘There are two windows, a house that is small,
- 23b *i-we^y* *i-jiŋ-k^haŋ* *ki-phlaŋ* *bad* *ka-linti-jad*
 3DIM- 3DIM-NON-close 3PL-grass and 3FSG-path-walk
 one
 one door, grass and a path.’ (AE+Aff, image 1)
- 24 *ka-linti* *ka-ba* ***leɪt - ja:ɟ*** *ka-ba* *tiŋ-k^ho?* *ha-k^hmat-jiŋ-k^haŋ*
 3FSG-trail 3FSG-REL go-walk 3FSG-REL hit LOC-front-NMZ-close
 ‘A trail that goes-walks hitting the front of the door.’ (AE+Aff, image 2)
- 25 *...ka-ta* *ka-surək* ***ka-par*** *na-pɔɔ- jɔŋ-u-lom*
 ...3FSG-INV 3FSG-road 3FSG-crawl ABL-INTERIOR-GEN-3MSG-hill
 ‘That road crawls from inside of the hill...’ (AE+Aff, image 4)
- 26 *ka-jiŋken* *ka-ba* ***bteŋ*** *na-u-wei* *u-lum* *fa-u-wei* *u-lom*
 3FSG- 3FSG-REL continue ABL-3MSG-one 3MSG-hill ALL-3MSG-one 3MSG-hill
 bridge
 ‘A bridge that continues from one hill to another hill.’ (AE+Aff, image 5)
- 27 *ka-jiŋ-ken* *ka-ba* ***pon*** *na-fi-lian* *fa-fi-lian*
 3FSG-NMZ-bridge 3FSG-REL bridge-over ABL-one-side ALL-one-side
 ‘A bridge that bridges over from one side to another side.’ (AE+Aff, image 5)
- 28 *...u-paip...* ***u-par*** *naŋ-ta- na-pɔɔ- jɔŋ-u-lom*
 ...3MSG-pipe 3MSG-crawl ABL-INV-ABL-INTERIOR-GEN-3MSG-hill
 ‘A pipe crawls from that from inside of the hill...’ (AE-Aff, image 1)
- 29a *u-pait- um* ***u- ja:ɟ*** *liŋba* *u-lum- ba?*
 3MSG-pipe-water 3MSG-walk through 3PL-mountain-big
 h
 ‘A water pipe walks through a big mountain
- 29b *bad* ***u-ksam*** *liŋba* *u-lom*
 CONJ 3PL-claw through 3MSG-mountain
 and claws through the mountain.’ (AE-Aff, image 1)
- 30 *ka-jiŋ-ker* *ka-sdaŋ* *na-u-deŋ* ***ka- ja:ɟ*** *ter-ter*
 3FSG-NMZ-fence 3FSG-start ABL-3MSG-tree 3FSG-walk in a sequence
 ‘A fence starts from a tree, goes consecutively (on and on).’ (AE-Aff, image 6)

References

- Bars, E. 1973. *Khasi –English dictionary*. Shillong: Don Bosco.
- Blomberg, Johan. 2014. *Motion in language and experience – actual and non-actual motion*. Lund: Travaux the institute the linguistique de Lund 53.
- Blomberg, Johan. and Zlatev, Jordan. 2014. Actual and non-actual motion: Why experientialist semantics needs phenomenology (and vice versa). *Phenomenology and the Cognitive Sciences*, 13(3): 395-418.
- Diessel, Holger. 1999. Demonstratives: form, function, and grammaticalization. *Typological Studies in Language* 42. Amsterdam: John Benjamins.
- Diffloth, Gérard. 1979. Expressive phonology and prosaic phonology in Mon-Khmer. In *Studies in Tai and Mon-Khmer phonetics and phonology in honour of Eugénie J.A. Henderson*, ed. by Thongkum, T.L., Panupong, V, Kullavanijava, P. and Kalaya Tingsabath M.R, 49-59. Chulalongkorn University Press.
- Diffloth, Gérard .2005. The contribution of linguistic palaeontology and Austro-Asiatic. In Laurent Sagart, Roger Blench and Alicia Sanchez-Mazas, eds. *The peopling of East Asia: putting together archaeology, linguistics and genetics*. 77–80. London: Routledge Curzon
- Ellas, H. 1972. *Ki khanatang u mynbarim*. Shillong: Don Bosco Press
- Jackendoff, Ray. 1983. *Semantics and cognition*. Cambridge: MIT Press.
- Jiménez Martínez-Losa, 2007. Towards a typology of fictive motion events: review of existing proposals and presentation of new perspectives. *Interlingüística*, 17: 562 – 269.
- Kharkongor, Iarington. 1968. *Ka Dienshonhi*. Shillong: Ri Khasi Press.
- Koshy, Anish and Wahlang, Maranatha G T. 2011. Mnar morpho-syntax: A preliminary study. *Indian Linguistics*, 72: 153 – 171.
- Lakoff, George and Johnson, Mark. 2003. *Metaphors we live by*. Chicago: University of Chicago Press.
- Lakoff, George and Johnson, Mark. 1999. *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic books
- Langacker, Ronald. W. 1990. *Concept, Image, and Symbol: The Cognitive Basis of Grammar*. Berlin and New York: Mouton de Gruyter.
- Levinson, Stephen. C. 1996. Frames of reference and Molyneux's question: Cross-linguistic evidence. In *Language and space*, ed. by P. Bloom, M. Peterson, L. Nadel and M. Garrett, 109-169. Cambridge: MIT Press.
- Levinson, Stephen. C. 2003. *Space in language and cognition: explorations in cognitive diversity*. Cambridge: Cambridge University Press.
- Levinson, Stephen. C. and Wilkins, David. 2006. *Grammars of space: explorations in cognitive diversity*. Cambridge: Cambridge University Press.
- Ma, Sai. 2016. *Fictive motion in Chinese*. University of Auckland research repository, Research Space: Auckland.
- Matlock, Teenie. 2004. Fictive motion as cognitive simulation. *Memory and Cognition*, 32: 1389 - 1400.
- Matsumoto, Yo. 1996. Subjective motion and English and Japanese verbs. *Cognitive Linguistics* 7: 183-226.
- Nagaraja, K. S. 1985. *Khasi: A descriptive analysis*. Pune: Deccan College.
- Peirce, J. W. 2007. PsychoPy - Psychophysics software in Python. *J Neurosci Methods* 162(1-2) :8-13
- Rabel, L. 1961. *Khasi, a language of Assam*. Baton Rouge: Louisiana State University Press.
- Rojo, A and Velenzuela, J. 2003. Fictive motion in English and Spanish. *International journal of English studies*, 3(2): 125 – 151.
- Singh, Nissor. 1906. *Khasi – English Dictionary*. Shillong, Eastern Bengal and Assam Secretariat Press.
- Slobin, Dan. I. 1996. Two ways to travel: Verbs of motion in English and Spanish. In *Essays in semantics*, ed. by M. Shibatani & Thompson S.A, 195-317. Oxford: Oxford University Press
- Slobin, Dan. I. (2004). The many ways to search for a frog: linguistic typology and the expression of motion events. In *Relating events in narrative: typological and contextual perspectives*, ed. by S. Strömquist and L. Verhoeven, 219-257. Mahway: Lawrence Erlbaum Associates.

- Slobin, Dan. I. 2006. What makes manner of motion salient? Explorations in linguistic typology, discourse and cognition. In *Space in languages: linguistic systems and cognitive categories*, ed. by Hickman M and Roberts S, 59-81. Amsterdam/Philadelphia. John Benjamins.
- Schultze-Berndt, E. 2006. Sketch of a Jaminjung grammar of space. In *Grammars of space: explorations in cognitive diversity*, ed. by S. C. Levinson and D. P. Wilkins, 63-114. Cambridge: Cambridge University Press.
- Sidwell, Paul. 2010. The Austroasiatic central riverine hypothesis. *Journal of language relationship* (4):117 – 134.
- Stosic, Dejan et al., 2015. Does the road go up the mountain? Fictive motion between linguistic conventions and cognitive motivations. *Cognitive processing*. Springer Verlag, 221 – 225.
- Talmy, Leonard. 1975. Semantics and syntax of motion. In *Syntax and Semantics*, ed. by J. P. Kimball, 181-238. New York: Academic Press.
- Talmy, Leonard. 1983. How language structures space. In *Spatial Orientation: theory, research, and application*, ed. by J. H. L. Pick and L. P. Acredolo, 225-282. New York:Plenum Press.
- Talmy, Leonard. 1985. Lexicalization patterns: Semantic structure in lexical forms. In *Language typology and syntactic description: grammatical categories and the lexicon*, ed. by T. Shopen, 57–149. Vol. III. Cambridge, UK: Cambridge University Press.
- Talmy, Leonard. 1991. Path to realization: A typology of event conflation. In *Papers of the seventeenth annual meeting of the Berkeley linguistics society*, ed. by L. A. Sutton, C. Johnson and R. Shields, 480-520. Berkeley: Berkeley Linguistics Society.
- Talmy, Leonard. 1996. Fictive motion in language and ‘ception’. In *Language and Space*, ed. by Bloom, P, Peterson, M A, Nadel L and Garrett M. F, 211-276. Cambridge, MA: MIT Press.
- Talmy, Leonard. 2000a. *Toward a cognitive semantics: concept structuring systems*. Vol. 1. Cambridge, MA: MIT-press.
- Talmy, Leonard. 2000b. *Toward a cognitive semantics: typology and process in concept structuring*. Vol. 2. Cambridge, MA: MIT-press.
- Taremaa, Piia. 2013. Fictive and actual motion in Estonian: Encoding space. *SKY Journal of Linguistics*.26:151–183.
- Zlatev, J. and Yangklang, P. 2004. A third way of travel: the place of Thai in motion-event typology. In *Relating events in narrative: typological & contextual perspectives*, ed. by S. Strömquist and L. Verhoeven, 159-190. Mahway: Lawrence Erlbaum Associates.
- Zwarts, J. 2008. Aspects of a Typology of Direction. In *Theoretical and crosslinguistic approaches to the semantics of aspect*, ed. by Rothstein, S, 79 - 106. Amsterdam: John Benjamins.

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CULTURE AND COGNITION IN LANGUAGE:
Formulaic Language as a Cultural
and Cognitive Phenomenon

BOOK OF ABSTRACTS

Institute of English Studies
University of Rzeszów
April 6-7, 2017

References:

Szcześniak, Konrad (2016) Nemáme sa čoho báť. Nie mamy się czego bać. The have PRON INF construction. *SKASE Journal of Theoretical Linguistics*. 13 (3)

Maranatha Grace Tham Wahlang

University of Hyderabad, India

Pipes crawl and roads walk: A linguistic study of non-actual motion in Khasi

A number of studies in language and cognition have looked at expressions like the following:

- a. The fence goes/zigzags/descends from the plateau to the valley
[cf. I went/zigzagged/descended from the plateau to the valley.]
(Talmy 2000: 138)

Such expressions are coined 'co-extension paths' by Talmy (1996, 2000) and fall under the wider umbrella of 'fictive motion expressions'. For theoretical reasons, we prefer the term non-actual motion given by Blomberg and Zlatev (2014). While the underlying mechanisms that motivate such expressions are studied in cognitive science, this paper focuses on the semantic aspect of the same, in Khasi.

Typologically, these studies have often been studied alongside motion verb studies and are looked at through the categorization of path and manner languages and classified according to Talmy's Path and Satellite languages (Talmy, 1996, 2000). More recently Slobin (2006), introduced a third kind of category, equipollent languages. Blomberg (2014) also classifies languages according to the amount of dynamicity that verbs are allowed to express for static objects. His comparison of French, Swedish and Thai show that languages have varying degrees of dynamicity that can be expressed (Blomberg 2014).

This paper will present a study of Khasi through both approaches. All descriptions were given by 30 native speakers of Khasi, who participated in an elicitation experiment. Khasi in this context refers to the standard Khasi, spoken as a lingua-franca of the Khasi and Jaintia hills. It is a Monkhmer language and a variety of the Khasian family (Diffloth, 2005). Khasi speakers used compound verbs, path and manner conflating verbs as well as bleached manner verbs to express Fictive motion. Changes in boundary were also expressed by a deictic marker or case marker following the verb. The path and manner conflating verbs used express what Blomberg classifies as non-movement (Blomberg, 2014) and fits in the schemata he proposed: Non-actual path > non-actual motion > non-actual movement. In addition, in terms of motion verb categorization, Khasi would fall under the 'equipollent' languages as proposed by Slobin (2006).

Donald Trinder

University of Rzeszów, Poland

Poland versus Germany: The portrayal of two nations at the time of the 1938 Munich crisis in the British press

The paper deals with the way in which the British press covered the events of September 1938. Specific attention will be paid to the differences in language used to describe the actions of

acs



Certificate Of Participation

This is to certify that

MARANATHA GRACE WAHLANG

~~participated/presented~~ a paper/poster at the

1st Annual Conference of the Association for Cognitive Science,
3-5 March, 2014, organized by National Brain Research Centre.

Harish Karnick
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Nandini C. Singh
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The Unfolding of Roads and Pipes: A Cognitive Linguistic study of Non-actual motion descriptions by Khasi - English bilinguals

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**The unfolding of Roads and Pipes: A Cognitive Linguistic
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SYNOPSIS

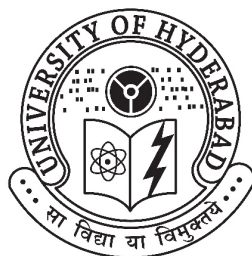
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PhD Thesis submission

BY

MARANATHA GRACE T WAHLANG

11CCPC03



Centre for Neural and Cognitive Sciences

UNIVERSITY OF HYDERABAD

HYDERABAD - 500 046

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0.1 Introduction

We are surrounded by objects of many different shapes, sizes, colours and textures. They come in various states - liquid, gaseous or solid. Some of them are mobile, while others are not. Objects also occupy space in different ways, depending on their size and shape. Their relationship with each other vary depending on the features they have - some objects contain other objects, some objects are in contact with each other while others are not, and some objects might be in motion and relate to each other through motion. In our everyday navigation of the world around us, we perceive different kinds of objects, react to them according to the need that we have and talk about them with people around us. We can say that spatial cognition is a fundamental ability to animals and human beings. It enables us to move, to plan our movements and to converse with each other about locations, movements and other spatially related discussions. The importance of this faculty is seen in our usage of spatial terms to describe other experiences in life - love, money, time , amongst many other things.

This thesis is interested in a very specific kind of object property - that of extension. Many of the objects that we encounter in our lives are extended and may cover more than one background. An easy and simple example to think of is a road or a path. If our figure is a road or a pathway, it has the property of extension, in that it goes on for a certain amount of length and will possibly traverse more than one background object. Our language about extended objects quite often includes motion words to describe this property. Compare the following descriptions.

1. National highway 44 runs all the way from Srinagar to Kanya Kumari.
2. Bus number 216 goes from Koti to Gachibowli.

We know for instance that objects like roads are immobile, unlike cars and bicycles and most animate objects. On the surface of it, these descriptions seem to straddle the gray area between literal and figurative speech, allowing immobile objects to act as nouns that can be used with dynamic verbs like run and go. If we look a little deeper, however, we find that such descriptions give us information about directions and dynamicity.

3. The mountain range goes all the way from Mexico to Canada.
4. The mountain range goes all the way from Canada to Mexico.

(Talmy, 2000a: 104)

What is interesting is that motion verbs in 1), 3) and 4) are used for situations that have no movement at all, in fact we have from – to constructions and directionality with no motion. Example 2) on the other hand refers to an object that is in actual motion and the verb used here represents motion, along with the *from...to* prepositional phrase.

What the motion verbs seem to do is to express characteristics of objects that are not individuated, or clearly demarcated in relation to the other object(s) that they are spatially related to. The use of motion verbs looks more like an attempt to do justice to our perception of extension. In fact, for some objects, like roads and landscapes, there is a potential of indefinite continuity, in the sense of the object extending well beyond our visual field. If we think for instance, of a road next to a river, we can say, “this road runs all along the river”. This extension of the road, while having a finite distance, when compared to individuated objects in the scale of things that we see in our visual field, has the potential for indefinite continuity. Terms that are used for this phenomenon include *fictive motion* (henceforth FM) (Talmy, 1996), *subjective motion* (Matsumoto, 1996), *abstract motion* (Langacker, 1990) and *non-actual motion* (henceforth NAM) (Blomberg, 2014).

0.2 Motivation

Scholars have found fictive motion expressions fascinating because they straddle the line between literal and non-literal expressions. Questions about fictive motion expressions are asked in both the field of cognition and linguistic typology. In cognitive studies, underlying processes that motivate fictive motion hold a significant place (Talmy, 1996; 2000a; Langacker, 1990; Blomberg, 2014). Empirical data suggests that the underlying process involve processing of motion information, giving rise to dynamic expressions of static objects or static states of objects (Matlock, 2004; Blomberg, 2014). Several motivations have been proposed for the use of motion expressions to describe extended objects. These range from the biological – human predisposition to motion (Langacker, 1990; Talmy, 1996; 2000a) to metaphorical reasoning (Jiménez Martínez-Losa, 2007; Ma, 2016) and mental simulation (Matlock, 2004). From the cognitive science angle, the important question been about whether speakers actually experience motion while using NAM expressions (Matsumoto, 1996; Matlock, 2004).

Typological studies on NAM, which use actual motion typology to describe how languages encode extension, identify four core elements - motion and path (represented by the verb), and figure and ground (represented by the participants in a visual scene) (Talmy, 1975). It is proposed that languages may be classified as verb-framed or satellite-framed on the basis of how they structurally encode a motion event (Talmy, 1985; 1996). A third-category of equipollently

framed languages has also been proposed (Slobin, 2004; 2006). Through a comparative study of English and Japanese, Matsumoto (1996) proposes some very significant correlations on the use of motion verbs to describe static objects:

The Path Condition: All fictive expressions must express some property of the path of motion.

The Manner Condition: No property of the manner of motion can be expressed unless it is used to represent some correlated property of the path. (Matsumoto, 1996: 12)

The latest typological and theoretical contribution to the field is Blomberg's hypothesis that "enactive perception" is a prime motivator for non-actual motion. This typological proposal is based on the level of dynamicity that a language allows to be encoded in a NAM expression (Blomberg, 2014). For example, Blomberg's work on Thai shows that information on manner is retained when manner verbs are used by speakers to express the velocity of movement along the objects being described (Blomberg, 2014). According to Blomberg, languages may potentially express non-actual movement, non-actual motion and non-actual path. Non-actual movement includes information about velocity, and as this paper proposes, also information about body configurations while moving. Non-actual motion refers to the use of motion verbs to describe static objects. Non-actual path refers to the use of dynamic expressions through the use of prepositions, case markers, and the like but without the use of motion verbs. Thus, a hierarchy is proposed: non-actual path < non-actual motion < non-actual movement (Blomberg 2014). That is, a language with non-actual movement may also have non-actual motion and non-actual path, while the reverse may not hold true.

Theoretically, Blomberg's approach differs from that of Talmy, Langacker or Matlock. He takes a phenomenological stance, which includes the role of the perceptual object in producing NAM (Blomberg, 2014). The model he builds includes three motivators for NAM, with the primary one being 'enactive motion' (Blomberg, 2014; Stosic et al., 2015). Enactive motion is a mode of seeing and experiencing extended objects. This is described as the first-person perspective for the purpose of experiments in Blomberg's design (Blomberg, 2014). The second motivation is 'visual scanning'. This is referred to experimentally as the third person perspective (Blomberg, 2014). The third motivation for the use of NAM is 'metaphors' (Blomberg, 2014).

The study of fictive motion/ non-actual motion is important for our understanding of spatial object perception. Given that world-over we have extended objects of some kind or the other, the theories regarding FM/ NAM need more testing among different populations to ensure the

universal claims that are being made. The universal claims of these theories can also be tested through multilingual populations, to check if they hold in a person in as many languages as they speak. In addition, the linguistic analysis of these expressions need to be done in as many language families as possible. Cross-linguistic studies have been brought up time and again by scholars looking at the relationship between cognition and language. Quite early on, as early as Schlegel, Herder and Humboldt (see Brown, 1967), there has been a recognition of the importance of comparative grammar studies in the scientific quest of understanding Language. Within the study of NAM/FM, it is important to preform cross-linguistic studies for a better understanding of what is a Universal capacity of sensing motion in our perception of these objects and what feature of NAM and FM are defined by the structures of a language. In addition, in a place like Hyderabad or any other big Indian city, there is also a need to understand the different ways in which the language context of people affects their behaviour and perception of these objects.

0.2.1 Khasi and Indian English

Khasi is an Austroasiatic languages spoken in the Khasi and Jaintia hills, North East India and is one of the few Austro-Asiatic languages spoken outside Southeast Asia. One of the purposes for studying Khasi is because it is a poorly studied language, like the other Austro-Asiatic languages spoke in the Indian subcontinent. The language is a Subject-Verb-Object language and it is polysynthetic and agglutinating through prefixes. It uses case markers, deictic markers, adverbs and compound verbs as part of its spatial expressions. Compound verbs are important for the study of NAM because they have the potential of conflating different semantic categories, like Path and Manner within them.

Indian English refers to the English spoken in the Indian subcontinent, to put it loosely. There are obvious problems with constructing a linguistically water-tight definition of what Indian-English is and looks like (see Rajagopalan, 1997; Sailaja, 2012) given the many varieties of language families in India and the kinds of Englishes that arise from the interaction between English and these varieties. Despite this vagueness and the issues surrounding IE, it is considered to be one of the Outer Englishes in a mapping of the English languages around the world (Kachru, 1985).

0.3 Objective(s) and scope

Through a study of Khasi - English bilinguals in both their language modes, I will attempt to do the following:

- to give a detailed description of how bilingual Khasi - English speakers use motion verbs to describe static objects in both their language modes, and compare the data to existing data from other languages.
- test the different proposed cognitive motivations for the use of motion verbs to describe extension. The experiments are a replication of Blomberg's work on Non-actual motion experience and descriptions. The experiment was designed and performed with Thai, French and Swedish speakers by Blomberg (Blomberg, 2014).

0.3.1 Description of research work

0.3.2 Language context

As part of defining the sample population, a pilot survey was conducted to have an idea of the language context of the participants. 31 people responded to questions in the survey. The sample populations in this thesis are all migrant, having moved from Shillong, Meghalaya to Institutes for higher education in the cities of Hyderabad, Bangalore, Kolkata and Delhi. The thesis includes a brief report of the survey.

0.3.3 Experiments:

Three experiments were conducted to test Blomberg's proposed underlying cognitive mechanisms for NAM.

0.3.4 1. Experiment 1:

An experiment was run amongst 30 Khasi speakers with a mean age of 25. The experiment had four conditions:

1. Depth extended+ afford human motion (DE+Aff)
2. Across extended+afford human motion (AE+Aff)
3. Depth Extended - afford human motion (DE-Aff)

4. Across extended-afford human motion (AE-Aff)

38 images were presented, 2 of which are practice images, 12 controls, 6 images for every test condition. The experiment design was deployed on psychopy, on a 16 inch laptop screen.

0.3.5 Hypothesis

1. The depth-extended images with objects that afford human motion are expected to elicit the most number of NAM expressions.
2. For the third person perspective however, the affordability of motion should not have a significant effect given that visual scanning should facilitate the production of NAM expressions throughout, unless there are linguistic conventions that stop this from happening.
3. Since the affordability of motion is expected to have a significant effect on the number of NAM expressions, and images with objects that do not afford human motion are expected to elicit

0.4 Experiment 2

The same experiment was conducted with the same sample population in English. They were instructed to speak only in English.

In addition to the above hypothesis, the following questions were raised:

1. Do speakers choose to highlight aspects of Path the same way they did in Khasi?
2. How much of Manner is allowed in English for Khasi-English bilinguals?
3. What are the cross effects between Khasi and English, if any?

0.5 Experiment 3

The same experiment was conducted with the different sample population in English, to ensure that the participants in the previous experiment were not affected by their previous exposure to it during their participation in Khasi. They were instructed to speak only in English.

0.5.1 Analysis and results

The package lme4 (Bates, Maechler & Bolker, 2012) in R (R Core Team, 2012) was used to perform a generalised linear mixed effects analysis (glmer) of the relationship between the Conditions and the count of NAM expressions, in Khasi and English (for both sample populations). The independent variables Extension and Affordability as fixed effects, in the model. As random effects, Participants were accounted for. The differences between each stimuli was not taken into account because there was not enough exposure to the same stimuli, and would it require a bigger sample size to take them into account. In all the groups, Affordability had a significant effect on the use of NAM, in Khasi the results gave a P value=0.009, while extension had no significant effect on the use of NAM. The interaction between affordability and extension also showed so significant results. Similar results were found in the English modes. In the first group, the property of Affordability of motion has a significant effect on the use of NAM expressions, P value= 0.003, while extension had no significant effects. The interaction of affordability of motion and extension also had no significant effects on the production of NAM descriptions. In the second group, the results shows that affordability of motion has a significant effect on objects with depth extension (p-value = 0.003) and follows a similar pattern, with only Affordability showing significant effects on NAM production. Extension and the interaction between extension and affordability shows no significant effect on NAM production.

0.5.2 Linguistic analysis

Linguistically, the descriptions given by participants was analysed using the semantic analysis model Holistic Spatial Semantics (henceforth HSS) (Zlatev, 2003). In terms of Blomberg's typology, Khasi has non-actual path, non-actual motion and non-actual movement, while the English descriptions only have non-actual motion and non-actual path. In terms of verbs most frequently used, there was a difference in the use of exit/entry verbs, consistent in both groups, i. e Khasi vs English (same group) and Khasi vs English (different groups). This points to an effect of the language mode on the speakers, making them encode path on different word categories. This is significant because both Khasi and English have the resources for entry and exit but participants consistently choose to use them differently depending on what language they were instructed to speak.

0.6 Conclusion

The results point towards the role of the Affordability of motion on objects as being a motivator in our use of NAM expressions. The next question that arose was whether this behavioural result would differ if participants repeated the experiment in their English mode. The experimental results show that the results in the English mode follow the same direction as the results of the Khasi mode, i. e. that the affordance of motion is the potential motivator in the use of NAM expressions. The results are reminiscent of Stosic et. al's results of the same experiment in French, German, English and Italian (Stosic et. al, 2015). As of now, we can conclude that the affordance of motion seems to be the main motivator for the use of NAM, across these languages. This also applies to performance in different language modes in a multilingual. The result of enactive motion as a primary motivator of NAM did not hold true for the Khasi - English multilingual population. In terms of bilingual repertoires, there is a level of conceptual transference; however it is unclear if this is at the level of the individual speakers or if it is a stabilised convergence of languages, in this case it could be Khasi or a mixed convergence of South Asian grammatical structures and English, leading to a separate structure like reduplication in Indian English. The role of other linguistic features from the Monkhmer family is also a potential player in the descriptions found in this study and future work would include other languages from the Monkhmer language family.

The language context of participants has been an important, if unresolved issue in this thesis. I propose the construction of models that account for the multilingual context of India as the next step towards understanding any work on multilingualism in India. Such a model would have to account for language contact, multilingual childhoods and a semblance of something like IE as a product of being spoken in a linguistic area, with shared characteristics and variations as a product of individual language or language families' effects on it. Such studies would also need to reconsider the idea of a native speaker, since such a language context would do away with notions of a particular set of people who know a language best, given that something like IE would likely not have the same features across regions but it would allow for variations, while holding some shared features. This kind of working paradigm would follow Kachru's ideas of the ways in which Englishes around the world are organised (Kachru 1985).

0.7 List of publications based on research work:

1. Wahlang, Maranatha GT and Koshy, Anish. 2018. Descriptions of co-extension paths in Khasi. *Journal of South East Asian Linguistic Society*, 11(2): 40 - 6.

2. Wahlang, Maranatha GT and Raju, S Bapi. An investigation of Non-actual motion descriptions by Khasi-English bilinguals. (In communication)

0.7.1 Conference papers:

Marantha Grace Tham Wahlang: “Pipes crawl and roads walk: A linguistic study of non-actual motion in Khasi. Paper in Culture and Cognition in Language: Formulaic language as a Cultural and Cognitive Phenomenon” Rzeszow, Poland. 7 April 2017. Talk.

Maranatha Wahlang , Kiran Kishore, Gautam Sengupta. “Perceptual Span of Readers of Hindi in Devanagari”, ACCS. Delhi, India. 3rd March 2014. Talk.

0.7.2 Workshops:

1. India Workshop, Transliterating Indian Languages on TypeCraft, NTNU, Trondheim, Norway. 1 – 9 Oct 2011. (Khasi language representative).

References

- Bates, D. M., Maechler, M., & Bolker, B. (2012). *lme4: Linear mixed - effects models using S4 classes*. R package version 0. 999999 - 0.
- Blomberg, J. (2014). *Motion in Language and Experience – actual and non-actual motion*, Lund: Travaux the institute the linguistique de Lund 53.
- Brown, R. (1967). *Wilhelm Von Humboldt’s Conception of Linguistic relativity*. The Hague: Mouton & Co.
- Jiménez Martínez-Losa. (2007). Towards a typology of fictive motion events: review of existing proposals and presentation of new perspectives. *Interlingüística*, 17: 562 – 269.
- Kachru, B.B. (1985). Standards, codification and sociolinguistic realism: the English language in the outer circle. In Randolph Quirk and H. G. Widdowson (Eds.), *English in the world: teaching and learning the language and literatures* (pp. 11–30). Cambridge, UK: Cambridge University Press.
- Langacker, Ronald.W. (1990). *Concept, Image, and Symbol: The Cognitive Basis of Grammar*. Berlin and New York: Mouton de Gruyter.
- Matsumoto, Y. (1996). Subjective motion and English and Japanese verbs. *Cognitive Linguistics* 7: 183-226.

Matlock, T. (2004). Fictive motion as cognitive simulation. *Memory and Cognition*, 32: 1389 - 1400.

Peirce, J.W. (2007). PsychoPy - Psychophysics software in Python. *J Neurosci Methods*, 162(1-2): 8-13

Pingali, Sailaja. (2012). Indian English: Features and Sociolinguistic aspects. *Language and Linguistics Compass*, 6(6): 359 - 370.

Rajagopalan, Kanavillil. (1997). Linguistics and the myth of nativity: Comments on the controversy over 'new/non-native Englishes'. *Journal of Pragmatics*, 27: 225 - 231.

R Core Team. (2012). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Stosic, D., Fagard, B., Sarda, L., Colin, C., (2015). Does the road go up the mountain? Fictive motion between linguistic conventions and cognitive motivations. *Cognitive processing*, 221 – 225.

Talmy, L. (1975). Semantics and syntax of motion. In J.P. Kimball (Ed.), *Syntax and Semantics* (pp.181-238). New York: Academic Press.

Talmy, L.(1985). Lexicalization patterns: Semantic structure in lexical forms. In T. Shopen (Ed.), *Language typology and syntactic description: Grammatical categories and the lexicon, Vol.III* (pp. 57–149). Cambridge, UK: Cambridge University Press.

Talmy, L.(1996). Fictive motion in language and 'ception'. In Bloom, P, Peterson, M A, Nadel L and Garrett M.F (Eds.), *Language and Space* (pp. 211-276). Cambridge, MA: MIT Press.

Talmy, L. (2000b). *Toward a Cognitive Semantics: Typology and process in concept structuring. Vol.2*. Cambridge, MA: MIT-press.

Zlatev, Jordan. (2003). Holistic Spatial Semantics of Thai. In Palmer, G and Casad, E (Eds.), *Cognitive Linguistics and Non-European Languages* (pp. 305 – 336). Berlin: Mouton De Gruyter.

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