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The Role of Contextual Restriction in Reference-Tracking

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THE ROLE OF CONTEXTUAL RESTRICTION IN REFERENCE-TRACKING

A Dissertation Presented

by

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ABSTRACT

THE ROLE OF CONTEXTUAL RESTRICTION IN REFERENCE-TRACKING

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This dissertation explores the semantics and syntax of switch-reference (SR). It makes novel generalizations about the phenomenon based on two empirical sources: A broad, cross-linguistic survey of descriptive reports, and semantic fieldwork that narrowly targets the Kiowa language of Oklahoma. It shows that previous attempts at formalizing switch-reference cannot work, and offers a new theory of switch-reference that derives the facts through effects that emerge from the interaction between the syntax and the semantics.

The empirical investigation results in four major findings: First, SR is introduced by its own head, instead of being parasitic to T° or C°. Second, switch-reference can track Austinian topic situations. Third, it must track topic situations when it is found with coordination, and it cannot do so with intensional embedded clauses. Finally, generalizations or theories based solely on the syntax are not able to account for these facts.

These findings are explained by analyzing switch-reference as a pronominal head in the extended verbal projection of the embedded clause. This head introduces a relation of identity or non-identity between two arguments. One of these is in the dominant clause, the other is the highest indexed constituent in the sister of the SR head. The arguments are selected indirectly, through binding structures that are interpreted as λ-abstraction. The clausemate argument is bound by the SR head; the properties of feature valuation derive the height constraint. The pronoun introduced by the SR head is bound by the connective. Binding by the connective results in the interpretation of the SR-marked clause as a property. This property is then ascribed to an argument in the dominant clause. This theory accounts for the generalizations, and makes fruitful predictions about other aspects of switch-reference, notably when it tracks non-referential subjects.

This dissertation improves our understanding of switch-reference, of situation semantics, and of reference-tracking in general. It ties reference-tracking to contextual restriction by use of topic situations, which are anaphoric pronouns used to restrict sentential interpretation. It provides the first solid evidence of morphology sensitive to situations. In addition, the theory of switch-reference proposed here relies on independently-motivated mechanisms in the grammar. This reliance links switch-reference to other mechanisms of co-reference from inside an embedded clause, and finds a solid place for switch-reference in linguistic theory.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Switch-reference is a morpheme occurring at the juncture of two clauses that typically indicates whether the subjects of those clauses co-refer. This dissertation will explore cases that are not so typical— many languages have been reported to use switch-reference in unexpected ways. These unexpected uses, found across the world, are observed to exhibit the same behavior. They indicate a maintenance or shift in the 'scene' from one sentence to the next. The shared purpose indicates that instead of radically changing our view of how switch-reference works, we should incorporate these scenes into our theory.

1.1.1 The proposal in brief

This dissertation begins by showing that switch-reference is introduced by its own head in the extended verbal projection, rather than being dependent on another head. It also shows that relying on morphosyntactic facts does not suffice to understand the phenomenon; a semantic investigation is necessary.

The dissertation then makes two empirical claims, and offers a new theory of switch-reference to account for them. The first claim is that switch-reference can track the topic situations of the joined clauses, rather than the subjects. A topic situation is a semantic object, a silent pronoun that refers to the part of the world that the sentence is about, and on which its truth depends. This claim accounts for the 'scene-tracking' effects, and allows us to maintain the basic use of switch-reference as a reference-tracking device.

The second claim is that switch-reference always tracks topic situations when it is found with coordinating conjunctions, whose clauses contain a topic situation pronoun. When switch-reference occurs with intensional subordinating connectives, whose clauses lack a topic situation pronoun, it tracks the subject. This derives the observation that the unexpected uses of switch-reference never occur with intensional connectives.

I then propose a theory of switch-reference that will derive these claims with a combination of syntactic and semantic structures. The switch-reference head is a complex pronominal head. It merges above the inflectional layer of its clause, and selects the highest argument below it. It also introduces a variable that is related to the selected argument by a relation of identity or non-identity. This variable is then bound by the connective, creating a property that adjoins to the dominant clause.

1.1.2 Results

The main empirical result of this dissertation is a broader understanding of switch-reference. It makes new generalizations about switch-reference that can be tested in many other languages. The theory of switch-reference it offers is the first to take into account the effects that emerge from the interaction of independently motivated structures in the syntax and the semantics.

These empirical results have theoretical import as well. It creates a link between switch-reference and other types of cross-clausal reference. More narrowly, it provides the first clear demonstration of morphology being sensitive to situations. Situations have proven extremely useful in understanding semantic phenomena, but had never been 'seen', either as overt pronouns or through its interactions with the morphology.

By adding to our understanding of switch-reference, this account opens new avenues of research. It establishes the first well-supported link between switch-reference and the context, which is found in hundreds of languages around the world. Many of these languages are underdocumented and endangered, and this result can aid other researchers and teachers in filling those gaps in our conscious understanding of these languages.

The methodological result is support for the use of semantic fieldwork in linguistic research, especially on underdocumented languages. This study has relied on elicitation oriented at felicity judgments rather than grammaticality judgments, so the dissertation discusses methods and tasks used to conduct the investigation.

1.1.3 Outline of the dissertation

Chapter One discusses the research methodology and introduces the reader to the Kiowa language, which is the empirical focus of the study. Chapter Two introduces the reader to switch-reference, and employs a comprehensive look at its use around the world to argue against any theory reliant on morphosyntactic facts alone. It also argues that switch-reference is introduced by its own head, and critiques Finer's (1984) theory of the phenomenon. Chapter Three introduces non-canonical switch-reference. It argues against Stirling's (1993) account of switch-reference, and proposes two hypotheses: That switch-reference is tracking topic situations, and that it always and only does so with coordination. It then discusses semantic fieldwork that successfully tested these hypotheses. Chapter Four provides a structure of switch-reference capable of handling its various uses and configurations, and provides the first thorough compositional semantics of the phenomenon. Chapter Five discusses a few open questions and summarizes the dissertation.

1.1.4 Note to the reader

Before we begin, let me mention that the exposition in this dissertation will contain thorough background explanation of the key concepts. Some of these explanations might seem naïvely superfluous to you. However, it is necessary not only for the demonstrative purposes of subject mastery required in a doctoral dissertation, but also to instruct readers who will have come from a wide variety of linguistic backgrounds. The central argument brings together several disparate concepts from different linguistic subfields. While these are all crucial in the development and understanding of the argument, they are little understood outside their subfields. I learned this from the questions I've fielded from helpful audiences at the various talks I've given on material herein contained. Therefore, I cannot assume that any particular reader is already familiar with every pillar of the argument.

For instance, while switch-reference is well-known to descriptivists and experts in indigenous languages (e.g., Americanists), it is not well-known to theoretical linguists or experts of the most widely studied languages. Situation semantics is not familiar to all semanticists, much less linguists whose specializiations lie elsewhere. Even the formal, compositional, truth-conditional semantic framework I will use is not familiar to every linguist. Finally, there's the Kiowa language, which is spoken by few. It is relatively well-known in scholarly circles, compared to the five thousand or more languages that get no attention at all, but little is widely known about it. I hope that this book fills these gaps to some extent, demonstrating the value of each part, and bringing together researchers from different areas of linguistics.

1.2 Methodology

This section discusses the methodology used for this study, which can be summarized as semantic fieldwork using a mix of data sources. Linguistic study of a language requires working with people who speak that language fluently and natively. Sometimes, the researcher or some of their colleagues are native speakers, and they can serve as their own sources. I am not a native speaker of the Kiowa language, nor have I achieved native-like fluency. Therefore, fieldwork with native speaker consultants has been crucial.

1.2.1 Linguistic fieldwork

This study is based on data collected through a fieldwork methodology reliant on a mix of techniques. Some of the data was directly elicited, some was collected from spontaneous speech, and some from texts recorded and transcribed by earlier speakers and scholars.

Fieldwork is one of two basic ways that linguists collect data from native speakers. The other is through experiments. A linguistic experiment involves having a large number of people perform a narrow range of tasks designed to inform us about a single phenomenon that has been strictly controlled for. Participants, called 'subjects', only participate for a short time, and their contribution is strictly anonymous. The value of experiments comes from the elimination of single-speaker effects, as well as the provision of results that can be analyzed for statistical significance.

The research presented in this dissertation contains no linguistic experiments, for two principal reasons. The first is that it was more desirable to build longer-term relationships with the participants. The second is that there remain so few speakers of Kiowa, spread out over such vast distances, that any experiment would

be extremely difficult to conduct, and any statistically significant result would be unlikely. Instead, this study relies on fieldwork.

Linguistic fieldwork involves having a small number of people (sometimes just one person) perform a broad range of tasks designed to inform us about numerous phenomena. Participants, called 'consultants', usually participate for long periods of time, sometimes decades, and usually take great pride in being credited explicitly for their contribution. Some will even co-author articles and books. The value of fieldwork comes from the ability to quickly investigate a wide variety of subjects, the chance of encountering interesting data through the speakers' spontaneous speech, and the personal connection to the people and the community where the fieldwork takes place.

1.2.2 Data collection logistics

In this section, I will discuss the logistics of this study. Early stages were self-funded, but the bulk of the fieldwork, and all of the equipment, was funded by a Doctoral Dissertation Improvement Grant from the National Science Foundation ([#BCS-084390]). One of my thesis committee chairs, Dr. Seth Cable, is listed as Primary Investigator for administrative purposes, but I conducted all of the fieldwork.

1.2.2.1 Consultants and locations

This study is built on fieldwork that I conducted in several stages from December 2006 to September 2009, with follow-up in the summer of 2010. Most of it was conducted on site in Oklahoma, either at the Kiowa Tribal Complex in Carnegie, or at the homes of the speakers, in Carnegie and Mountain View. Some of the data was collected in sessions conducted on the telephone, using landlines to maximize sound clarity.

My main consultants were Christina Simmons, George and Marjorie Tahbone, and to a lesser extent Carole Willis and Melva Wermy. I also benefitted from great discussions with Dr Gus Palmer, Jr., and Alecia Gonzalez.

1.2.2.2 Recording and storage

Early sessions (before the grant) were not recorded except by field notes. Nearly all the sessions after the awarding of the grant were recorded and stored. The recordings were conducted with equipment designed for easy set up and portability. The sound quality turned out to be less than pristine, especially with background noise (air conditioners, children running around). I accepted that loss in sound quality as a cost for portability, especially since the study was not phonetic or phonological in nature. I used an audio-technica AT-8004 multidirectional microphone, mounted on a table stand. Since it was multidirectional, it permitted sessions with multiple speakers at the same time. The microphone was plugged directly into a Sony ICD-UX70 recorder, which was able to store dozens of hours of recordings. I backed up the recordings each night in multiple locations, to ensure their preservation.

1.2.2.3 Analytical tools

I cleaned up and pieced apart the recordings with the Audacity program, and when it was helpful, I used Praat to verify tone markings, etc. Since there was no phonetic analysis required, there was little work done in this regard.

1.3 Data collection methods

This section discusses speaker tasks and data collection methods. I took care to employ different tasks and methods precisely to profit the most from each one's advantages, while minimizing each's disadvantages. First, I will discuss the major

speaker tasks, and some major practical issues concerning them that I encountered. Then, I will discuss different collection methods, which, despite their partisans' claims, are all useful.

1.3.1 Speaker tasks

I had speakers perform the two basic types of task used for linguistic investigations: Judgment tasks, where speakers determine the grammaticality of an expression submitted to them; and production tasks, where speakers speak, sign, or write expressions. I consider the task of translation to be a type of production task, although it does involve some judgment.

Typical fieldwork sessions began with simple translation tasks. These would often just be word translations ("How do you say 'turkey'?"). They take some time to get through, but they are very useful because they warm the speaker up, and are often the source of interesting lexical items that can be used when constructing data later on. I often used words elicited at the beginning of a session throughout the session. Doing so provided a sense of continuity, demonstrated to the speaker the relevance of the opening task, and was often a lot of fun, like one session where we kept building phrases with *sə̲́gà* ([sə̲́ːʷgʲæ]), the Kiowa word for 'flirt'.

Translations were also useful in later stages, as well. Because English has no switch-reference, simply having people translate 'X and Y' would give a useful example. Care must be taken, however, because of the difference in structures used across languages to get similar meanings across. For instance, many languages don't have an adjective "heavy", but instead use a verb which could be translated as "be heavy," but which cannot be used without some verbal marking. This is often the case in Kiowa.

Sometimes, an English expression can be translated in multiple ways. For instance, a Kiowa speaker would translate 'my car' as *nə́̄u-kə̀̄u*, literally 'me-car'.

However, if you made a sentence containing the English expression, the corresponding Kiowa phrase might differ. We might expect the translation of the assertion 'This is my car' to be *Ḗdè nấu-kàu dấu.* ('this me-car is'). However, it is generally translated as *Ḗdè kấu ḗ dấu*, literally 'this car is to me'.

This difference is also apparent when dealing with the translation of functional items. One difference I often encountered was in English clauses with *when*. These are usually translated into Kiowa with the postposition *è̱*. But sometimes, in episodic contexts, an English *when*-clause was translated as a simple conjoined clause. Instead of saying 'When X, Y', the consultant would say 'X and Y'.

(1) a. *Elicitandum:* When John came in, Bill sat down.

b. John hébà nàu Bill èm sấu.

J. ∅– hé:ʲb-à nɔ̃ B. ẽm– sɔ́:

J. [3s] enter-PF and-DS B. [3s:rfl] sit down.PF

'John came in and Bill sat down' (f.n.)

This wasn't altogether uncommon, and even in English this type of 'substitution' occurs, because the use of and signals a strong link between the events that could include the meaning of *when* or *if*.

When encountering unexpected translations like this, it is not unheard of for linguists to become flustered or even frustrated with the speaker. This is especially the case when our expectations are heightened by submitting examples culled from previously published research. However, we must remind ourselves that translation often varies depending on the context. If we, who design the research, fail to provide enough context to control for unexpected translations, we can only blame ourselves for their appearance.

Judgment tasks rely on the speakers to determine whether an expression submitted to them is acceptable. The judgment is typically a grammaticality judgment: Is the expression allowed by the language's grammar? To perform this

task, a speaker must subconsciously access the grammar that they acquired as a child. This accessing is called an 'intuition'. Linguistic intuitions are a very reliable indicator of grammaticality, and thus a reliable indicator of the grammatical knowledge of the speaker. However, there are biases that risk preventing a judgment from reflecting that knowledge accurately— satiation effects (Goodall 2011), single-speaker effects (dialect, idiolect), and prescriptive effects.

The two basic tasks, judgment and production, are used by linguists both for experiments and for fieldwork. Besides the differences in task, the linguistic performance environment where the tasks are performed matters as well. Different environments require different data collection methods. Linguists have debated the relative usefulness of particular environments: uncontrolled or 'real-world' environments are more natural, while artificial or laboratory environments are better controlled. The debates mirror to some respect the larger methodological battles between generative and anthropological approaches. However, I employ each of these in those instances where they are the most useful.

1.3.2 Collection methods

1.3.2.1 Introspection

Introspection is the easiest method of linguistic data collection: The linguist performs judgment or production tasks in their mind. The method is easy for three reasons. First, since everyone speaks some language, practically anybody can do judgment or production tasks (albeit with some training). Second, it requires no logistical efforts, so it can be set up quickly. Third, any task can be quickly replicated by anyone capable of reading the results. This ease has led it to being the most commonly used method of data collection in linguistic theory. Its usefulness in that regard is unquestionable. However, it requires that the linguist be fluent enough in the target language to judge and produce data with the quality and

naturalness of a native speaker. My command of Kiowa does not permit me this, so I had to eschew introspection for elicitation.

1.3.2.2 Elicitation

Elicitation is a methodology that is derived from the introspective approach. Essentially, it involves having other people perform introspection, and reporting the results. It requires some logistical effort to enlist speakers as consultants, whether for the study itself or any replications of it. It is also difficult to run speakers through the countless iterations of data required for thoroughness, especially if they do not share the linguists' scientific curiosity about the more obscure facets of the language. Despite being more difficult than introspection, elicitation does lead to the same type of results, and often with better quality.

It is also useful because it balances the 'wildness' of collecting natural speech and the unnatural strictness of a linguistic experiment. Like experiments, elicitations are controlled (usually), they provide negative evidence, and they can be focused on one phenomenon. However, they do lack the statistical rigor and efficiency of experiments. Like natural collection, elicitation involves one-on-one interaction with consultants, which develop into long-lasting working relationships. The personal nature of elicitations can open a door for the researcher into the community, building trust that the research is helpful and beneficial. However, they do lack the free flow and nearly-complete naturalness of recorded speech.

1.3.2.3 Semantic elicitation techniques

This section describes in detail the techniques used to elicit data. The specificity is necessary because of the semantically-oriented research, which requires a slightly different technique than is typically used.

As I mentioned earlier, elicitation is typically employed to draw out facts concerning grammaticality. The judgment and production tasks tell us about the core

'grammar' of a language: the syntax, phonology, and morphology. However, the type of fieldwork involved in this dissertation is semantic. The major difference between semantic fieldwork and other types of fieldwork is that it involves felicity rather than grammaticality.

Felicity describes whether an expression is appropriate for the context in which it is uttered. When an expression is appropriate, it is considered **felicitous**; when inappropriate, it it is **infelicitous**. Infelicitous expressions are marked with a # rather than a *. This appropriateness can be semantic or pragmatic. That is, an expression is felicitous for a particular context if it is true given that context, and pragmatically appropriate for it.

There are many reasons why a particular expression might be infelicitous. For example, imagine this context:

> **Context:**
> *You are holding a green book with no jacket, and you ask me what color it is. I have no problems seeing colors.*

Given this context, the sentence *The book is green* would be grammatical and felicitous. But the sentence *The book is red* would be infelicitous given the same context, even though it is grammatical, because it is false. Likewise, the sentence *My parents met in Iran* would be infelicitous, because although it is true, it is pragmatically inappropriate (it violates the Gricean Maxim of Relevance (Grice 1989)). The sentence *The jacket looks old* is infelicitous because it contains a presupposition failure. Crucially, all of these sentences are *grammatical*— as Chomsky (1957) famously pointed out, semantic and grammatical appropriateness do not always match.[1] This is the case even if we use words we do not understand, such as a

[1]The point had been made earlier, by Bertrand Russell (*Quadruplicity drinks procrastination*), Lucien Tesnière (*Le silence vertébral indispose la voile licite*), or any number of language games (e.g., *cadavre exquis*). But Chomsky developed the point to highlight the modularity of the grammar and the independence of syntactic structure and grammaticality from semantic meaning (and felicity).

sentence like *A seneschal durst not mulct his liege*. It sounds grammatical, even if it sounds non-sensical to a modern speaker of English.[2]

Since felicity depends on a context, any felicity-oriented elicitations require a context as well. As Matthewson (2004) points out, grammaticality-oriented elicitation typically avoids context, so it cannot suffice for semantic fieldwork. Matthewson discusses three major obstacles, which any semantic fieldworker must bear in mind.

First, simple translation tasks are completely useless for uncovering felicity conditions. Sentences cannot be asked about in isolation, because of the nature of semantic content. Semantics is truth-conditional[3], so sentences must be evaluated or produced with respect to what the judge knows or believes about the world. The only way to control for that knowledge is to put it in the speaker's mind with a context.

Secondly, most semantic objects have ineffable meanings— they cannot be easily put into words. As Matthewson points out, there is no point asking a native speaker of English what *the* means. Doing so is essentially forcing the consultant to make an analysis on the spot. This not only stands a minuscule chance of providing a useful result, but runs the risk of humiliating a consultant unable to provide a cogent impromptu analysis. Ineffability is even more clear when it comes to semantic objects in the grammar, like evidentials or switch-reference. For instance, Kiowa has an marker of evidentiality indicating direct speech as the source of knowledge. This marker is often translated in English as "I heard" or "Someone told me", because English lacks evidentials. If you ask your consultant to translate

[2]This sentence would not be non-sensical to past speakers, though. It uses archaic words to make an archaic point: "A lord wouldn't dare tax his superior."

[3]Not uncontroversially so, but even in dynamic semantics, where truth is based on the effect on the discourse (e.g. Heim (1982)'s context change potential), sentences cannot be asked about in isolation.

"someone told me it didn't snow", expecting "it didn't snow-evidential" (2a), you'd be in for a surprise, as the speaker will translate your whole sentence (2b).

(2) a. Háun thólsépdàumâuhèl
hɔ̃́n ∅– tʔól+sép+dɔ:-mɔ̂:-hel
not [3s] snow+rain-be-NEG-EVID
'(I heard) it didn't snow' (f.n.)

b. Hájél é jél haun tholsépyâu
hátél ɛ́– tél [hɔ̃́n ∅– tʔól+sép-yɔ̂:]
person.INDEF [3s:3p:1s] tell.PF not [3s] snow+rain-NEG
'Someone told me it didn't snow' (f.n.)

To get an evidential, you have to create a context where the speaker has heard this from someone else, then ask to produce the sentence. Switch-reference is even harder to ask directly about, because there is no translated paraphrase at all. Asking what *gàu* 'means' would simply be a waste of time. Knowledge of truth-conditions must be arrived indirectly through the construction of contexts.

Third, delivering contexts in a metalanguage runs a risk of confusion. We might expect that giving a context in English and asking for an answer in Kiowa might be a crucial lack of control. However, Matthewson finds no adverse affect, and neither do I. In fact, she argues that using a metalanguage can be more helpful than doing everything in the object language. This is especially the case in the United States, where nearly all native speakers of Native American languages are bilingual in English, and where almost no linguists are fluent in any indigenous language. In this investigation I used English to deliver the contexts, and to discuss examples. I know of no monolingual Kiowa speakers living after 1967, and all Kiowa speakers are also native speakers of English. Another factor in the use of English to deliver contexts is the fact that few Kiowas are literate in Kiowa. This is due to the long-standing lack of any education in the language (recall that most

speakers were banned from using their native language in schools), as well as to the lack of a standard official orthography. This fact requires oral transmission on my part. Though I am proud to be somewhat proficient in Kiowa, I am not fluent. The risk of misinterpreting my delivery of Kiowa metalanguage vastly outweighs the risk of mixing truth-conditions from one language to another.

I will add a fourth obstacle to this list: The added cognitive work for the speaker. Some speakers are better than others at putting themselves in context and making their judgments based on it. All my speakers got better with practice, but some did not do well at first. Some speakers have more vivid imaginations than others. In addition, few speakers are as good at following convoluted scenarios as linguists are, for the simple reason that linguists do it professionally. I took great care to ensure a balance of light and more involved contexts to keep the speaker interested. A speaker can get confused after being run through a lot of different contexts, and confusion leads to irritation, or worse. I found it helpful to use similar contexts, or a single context that could be re-used for multiple judgments.

The use of context is onerous and time-consuming, but it is critical for semantic fieldwork. Different kinds of context provide different kinds of results. The simplest type of context is the *lead-out context*. The linguist takes an observed expression and asks the consultant about possible contexts where it might be felicitous. For instance, you could bring up the expression *I am going to be the Super Bowl MVP*, and then ask questions like:

1. Could you say that if the Super Bowl was halfway through?
2. What about the morning of the Super Bowl? The day before?
3. Could a little kid say it?
4. Could you say it if the game is over, but the MVP hasn't been selected yet?

The lead-out context is great for fleshing out ideas and warming up speakers. It will often lead to insightful speaker observations, but it cannot be used alone. It is risky, because it forces speakers to come up with the details of the scenario, which might make the truth-conditions they are judging about substantially different from those you expect. Also, the contexts are not exhaustive.

The strongest type of context is the *lead-in context*.[4] The linguist gives the speaker a context that leads in to a yes/no judgment that depends on the the particular truth-condition in question. The context should be self-contained. The lead-in context is extremely useful because it can control for specific truth-conditions, and it can provide negative evidence. Usually, I used lead-out contexts to develop a hypothesis, and lead-in contexts to test them.

For instance, imagine I had developed a hypothesis that the quantifier *more* presupposes there has already been some. If the hypothesis is correct, positive evidence supporting it would be a context that introduces such a presupposition, followed by a speaker judgment that an expression with *more* is felicitous.[5] You instruct the speaker to listen to a scenario, then to judge the appropriateness of the following expression, based on that scenario? For example, here is a context and a sentence for you to judge for yourself.

> **Context:**
> *This morning at the office, your colleague Bill made a pot of coffee. Just a minute ago, the boss went to get some, but it was all gone. A new pot has to be brewed, and you decide to make a good impression. So you tell Bill:*

(3) I'm going to brew some more.

---

[4]This is the only context Matthewson discusses.

[5]This relies on the assumption of compositionality— the meaning of a sentence is composed from the meanings of its parts, so if a sentence is felicitous, so are all of its parts.

Accepting the context puts the fact that some coffee had already been brewed into the common ground, so it is a presupposition of the sentence. If *more* was not compatible with this presupposition, the sentence would be infelicitous, but a typical English speaker will find it quite felicitous.

To confirm the hypothesis, negative evidence is also helpful. For the same hypothesis, we can create a sentence that lacks the presupposition, and have the speaker judge a sentence with *more*. Let us repeat the task.

> **Context:**
> *You and your family go out to dinner at a Mexican restaurant. This restaurant is famous for the tortilla chips it brings to your table. However, this time, the waiter forgets to bring any chips, and the kids are getting restless. You tell your family:*

(4) I'm going to ask for some more chips.

Sentence (4) is typically found to be infelicitous, because you can't have "more chips" if you haven't had any yet.

A third type of context that is useful is the *follow-up sentence*. Here, the linguist uses a target expression in a sentence, then immediately follows it up with a sentence whose felicity depends on the truth-conditions of the first. For instance, (5a) is infelicitous because the first sentence does not introduce the presupposition required for *more*, while (5b) is felicitous and does introduce the requirement.

(5) a. I didn't pass out any flyers... # and then I passed out two more.

b. I poured out a bowl of milk... and then I poured out two more.

Follow-up contexts are helpful because they allow focusing onto a particular target, and they don't require onerous context-building, like lead-in contexts do. However, they're not always easy to build, since the second sentence has to depend on the first somehow.

Lead-out, lead-in, and follow-up contexts are the semantic contexts that were used in this study to help understand the use of switch-reference, without having

to ask directly about the switch-reference morphemes. However, while elicitations were the most important data collection method that I used, I also used some recorded and transcribed natural speech, as well as recorded texts.

1.3.2.4 Natural speech

The most naturalistic data comes from extemporaneous speech that is recorded without interference. Recording speech requires the same logistics as eliciting speech, except that there is less need for the linguist to prepare items to elicit. Speakers can be recorded in casual conversations, in formal conversations, or in narratives. Naturally occurring speech is a reliable way to capture linguistic use with little to no metalinguistic interference on the part of the speaker. However, while the language recorded in this manner is often described as natural, rare is the case where it is purely so, for three reasons that induce prescriptive effects on the speech recorded: The speaker is aware that the recording is taking place; The speaker is aware of the prestigious social status of the researcher; The speaker is often performing a kind of speech that requires attention to language use.

1.3.2.5 Consultation of texts

A very helpful source of data is previously recorded texts. These texts provide a permanent record of the language. Ideally, these would be stored in an online corpus, with items tagged for quick analysis. However, no such corpus of Kiowa data yet exists (though Laurel Watkins is working to put one online in the near future), so I had to rely on copies of hand-written or typewritten texts collected in several different places. Many were found in the papers of Parker McKenzie in the archives of the Oklahoma Historical Society, some were found in anthropological books about Kiowa stories (like Palmer, Jr. (2003)), while others were given to me by different Kiowa individuals, including my consultants. Texts are often literal

transcriptions of natural speech, but oftentimes are not— it is well-known that many Kiowa texts have been edited after the fact for clarity or style.

I will include under this rubric the consultation of grammars. A broad cross-linguistic investigation by one researcher cannot rely on fieldwork alone. Fieldwork is a long-term process, so it is inefficient for typological work. One must rely, therefore, on the work of previous researchers on different languages, published for posterity. In the languages where switch-reference is found, most of this work is based on the consultation of texts and the recording of natural speech. The danger of relying on grammars is that they are essentially a collection of hypotheses, and hypotheses are not always correct, especially given the quick pace of change in linguistic theory. Sometimes, the data can be interpreted in a different way than the author of the reference grammar proposes.

1.3.3 Why elicitation is essential

Some of the examples in this study are naturally occurring sentences (NOS), with the caveat that they might not be so natural. Some were collected from texts, others through the recording of spontaneous utterances. NOS are very useful in linguistic investigation because linguists can collect them relatively easily, and can be certain of their grammaticality. However, the lack of ungrammatical natural sentences limits the certainty and domain of any study reliant upon them, and the massive amount of data that results from this kind of collection takes a long time to prepare for analysis.

NOS are relatively easy to obtain— simply browse a text, or hold a microphone up to a native speaker. Recording NOS does not even require a linguist to be present; speakers can record themselves.[6] NOS have been argued to be the best

[6]The BOLD project (Basic Oral Language Documentation) does precisely that: It has distributed recorders to speakers of 100 languages in Papua New Guinea in order to create a massive corpus of over 1,000 hours of speech.

window into linguistic knowledge because they rely on no metalinguistic awareness whatsoever. They also provide independent evidence of all sorts; in recording speech, we might encounter new phenomena. Also, the sheer volume of data that can be collected permits corpus-based studies of frequency that inform us about gradient or stochastic grammaticality in the language. NOS are also very beneficial from a documentary standpoint.

However, it turns out that the properties that make NOS attractive make them insufficient for semantic fieldwork. It is simply not feasible to conduct a proper study of the semantics of a language by relying solely on naturally occurring sentences, for three reasons. First, they do not provide negative evidence. Second, they are inefficient in that they provide a lot of data to mine, and limit the explanatory power of the study to whatever data happens to be collected. Third, they are not controlled for context.

One major requirement for a linguistic theory is negative evidence— facts provided by ungrammatical or infelicitous sentences. It simply does not suffice to know what is attested; we must know what is possible. Knowing what is possible entails knowing what is impossible, and only negative evidence tells us what is impossible. NOS do not provide negative evidence, because they are by and large grammatical.

Collecting natural speech provides an enormous amount of data that can be used to build hypotheses. This is great for documentary purposes or corpus-based studies. However, raw recordings are not helpful for semantic investigation *because* they give so much. Recordings must be listened to and transcribed.[7] It takes hours to transcribe even a few minutes of recorded speech, even if you are fluent in the language. After transcription, the data needs to be tagged. The more data

[7]Someday, if automatic transcription software is of high enough quality, this task will become much easier, at least for major languages.

you collect, the more arduous this task becomes. Natural speech also hampers investigations because the linguist can only study the constructions the speaker happened to use while the microphone was on. For the understanding of very frequent phenomena, this is not a problem. However, much of what we know about language comes from understanding rare phenomena (rare but perfectly grammatical). One can only imagine how long you would have to record native speakers of American English before hearing a single example of negative auxiliary inversion (*Never in my life have I seen anything like that!*), if there were only a few hundred speakers of the language. After that, we can cringe at the thought of the time it would take to catch enough examples to form a powerful theory of the phenomenon.

The third factor against relying solely on NOS is that it does not allow us to confirm hypotheses of language knowledge. For instance, let's imagine we did encounter enough examples of negative auxiliary inversion. It would tell us this is a permitted phenomenon, but it does not let us predict which contexts allow it *and which ones do not*. We can hypothesize about such contexts, but to verify any hypothesis we must test it by controlling for the context. NOS provide no way to do this. This problem is all the more acute in semantics, because of felicity's dependence on the context. Matthewson (2006) points out that semantic fieldwork is impossible without some frame of reference for the speaker to make a judgment. Truth conditions are facts about the world; thus, without some world and facts about it, the speaker is in the dark, and so is the linguist. This requirement is even clearer when we consider an Austinian notion of truth (chapter 3. If sentences are evaluated with respect to some topic situation, then without some sense of which topic situation the speaker has in mind, there can be no evaluation. For instance, in English, saying *The light is flickering* can only be judged true or false if we know what light we're talking about. NOS do not occur in a vacuum, of course: they

will have a context. However, while a broad context is always inferrable, the exact context of a particular sentence is rarely described overtly, and its inference is not always obvious. The context must be tested to be assured, but NOS do not provide that test.

1.3.4 Conclusion

The methodology employed in this study combines different data collection methods and speaker tasks to provide as complete a picture as possible of switch-reference and its use in Kiowa. It relies on elicitations oriented towards semantic notions of felicity, supported by consultation of texts and natural speech. The rest of this chapter will introduce the reader to the Kiowa people and their language, by providing an outline of their history and a brief sketch of the language. It will also introduce the glossing conventions employed in this dissertation.

1.4 The Kiowas and their Language

While this dissertation involves a wide cross-linguistic investigation, its empirical depth focuses on the Kiowa language. Kiowa is an endangered language of the Kiowa-Tanoan family spoken mainly in Southwestern Oklahoma. The language is no longer acquired by children, and all fluent speakers are elderly. Monolingual speakers survived as late as the 1960's, but none remain today.

1.4.1 A brief ethnological history of the Kiowa

The Kiowa (in the language: Cáuigú, [kɔ́jgʷú]) are a Plains Indian people. Like many other Plains tribes, before forced settlement, they were a nomadic people, whose lives largely depended on hunting bison. Their final migratory range was centered in what is now Western Oklahoma and Kansas, and the Texas Panhandle. However, they had not been in that range for much more than a hundred years

when they were finally forced to settle onto a reservation around 1875. Historical evidence and tribal recollection takes us as far back as circa 1700. At that time, the Kiowas lived in the Yellowstone area (Mooney 1896). Over the next several decades, they found themselves moving eastward, settling in the Black Hills area of South Dakota by 1775. There, they were overpowered by the Lakota, who pushed them back out onto the high plains. Further conflict with the Cheyenne led them southward towards their final range by 1790, at which point they formed an alliance with the Comanche that lasted into the reservation period.[8]

By the time White explorers and anthropologists encountered the Kiowa, they were fully ensconced in the Plains culture. However, linguistic evidence indicates that they were once a Pueblo culture. Early on, Harrington (1910), citing Mooney's data, noted the language's correspondences to the Tanoan group, notably Tewa. This link was more firmly established by Harrington (1928) and by Miller (1959), who sought to include Kiowa in the proposed Aztec-Tanoan family. Definitive sound correspondences were established by Hale (1962), notably between Kiowa and Jemez. Based on this work, it is now accepted that Kiowa and the Tanoan languages descend from a common language.

Therefore, we can safely assume that the Kiowas were once among the Proto-Tanoan speaking people. Currently, the Tanoan peoples live in Pueblo villages in the Rio Grande Valley of New Mexico. It is therefore commonly deduced that the Kiowas once lived there as well. Otherwise, we would have to assume that somehow, the Kiowas stopped speaking their old language and began speaking a Tanoan language without extensive contact with Tanoan-speakers. Besides, we would also have to assume that this language shift took place long enough ago that Kiowa

[8]As is often the case with American tribe names, the English name for the Kiowas is an exonym. It is based on the Comanche corruption of the Kiowa name *Cáuigú*. The Kiowa name for the Comanche, *Câigù* ([kʸâjgu]), means 'enemies', suggesting that first encounters were not friendly.

no longer resembles a dialect of any other Tanoan language. The Kiowa/Tanoan split certainly happened quite some time ago, though we will probably never pinpoint the date. Jacobsen's (1983) glottochronological speculation places the split at several *thousand* years ago, but this seems highly implausible.[9]

We may never know when or why the Kiowas left New Mexico for good. However, we do know that neither Kiowas nor Pueblos remember each other. Mooney (1896) found no Kiowas claiming parentage with the Pueblos, and nobody has published accounts of Pueblos asserting a link to the Kiowa. The split probably happened before the horse arrived (in the late 1500's), based on the development of the Kiowa word for 'horse'. The word *chê* ([tsə̂ːʲ]) is used today for 'horse,' but before the arrival of the horse, it meant 'dog'. In Kiowa, the word's meaning shifted, and it eventually referred to the beast of burden that dragged tipi poles and such. After horses replaced dogs, the word was applied to horses, and dogs have since been called either *chêhì* ([tsə̂ː+ʲhĩː]), 'original beast of burden', or *chégùn* ([tsé+gun]), 'tipi-pole beast of burden'. Speakers of the Tanoan languages never lived the horse-dependent plains culture, and this change did not occur, as evidenced by the cognates for *chê* in modern Tanoan languages, which still mean 'dog'.

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[9] I am suspicious in general of the application of glottochronology to language families outside of Europe. The theory is based on the development of Proto-Indo-European into the modern European languages. Two factors make its application to Kiowa implausible. First, the history of the various European peoples is relatively well-known, and fairly precise dates allow a correspondent link to the (reconstructed) language development. This is not the case for Kiowa, or for any American people, beyond a few hundred years at most. Second, the Kiowa people's migrations surely disrupt the uniform rate of change that underpins glottochronology. The Kiowas had little contact with the Pueblo peoples of New Mexico since they left the Rio Grande valley. They were in close contact with languages of other families for the entire time they've been gone. Thus, any rate of change was likely accelerated by contact, though we can't know how much. Similar accelerations have occurred in Europe. For instance, French has changed much more from Latin than Spanish has, despite the fact that Iberia was cut off from Rome long before Gaul. The ancestors of the speakers of French (the speakers of the *langues d'oïl*) were in close contact with speakers of Germanic and Celtic languages, and this had an effect on the rate of change, making it more profound than changes in Spain, despite having less time to develop. Given cases like this, we must question the notion of a uniform rate of change, and chronologies built upon it.

A solitary hand-written notecard in the papers of Parker McKenzie claims that Kiowas left the upper Rio Grande area around 1525, just after Cortes and his Indian allies conquered the Aztecs.[10] I do not know what evidence supports this claim, and no motivation is suggested. This date might be plausible, though. It would place at least seven generations between leaving the Rio Grande Valley and turning up at Yellowstone around 1700— the earliest era still recalled in the tribal histories recorded by Mooney. This, added to the seven or so generations before Mooney interviewed the Kiowas puts fourteen generations between the early 1500's and the late 1800's. Given the significant cultural changes and losses in just four or five generations since the reservation period, that seems like more than enough time for the Kiowas to forget the other Tanoan peoples and Pueblo culture.

1.4.2 The status of the language

As a people, the Kiowas numbered over 12,000 during the most recent U.S. census (2000), despite a rather high blood quartile (1/4). This number includes the present author. In that same census, only 865 claimed to be able to speak Kiowa. This number does not include the present author. The census data are self-reported, and language-related data do not include any judgment of fluency. Estimates as to the number of fully fluent speakers range from a dated 400 (Watkins (1984), certainly using Parker McKenzie's count) to 60 (Linn 2011). All these speakers are elderly, and no children are known to be acquiring the language.

Most Kiowa speakers live in southwestern Oklahoma, in and around the cities of Anadarko, the site of the BIA Agency, and Carnegie, where the Tribal Center is located. There is no longer any reservation. In the 1890s, the tribal land held in

[10]These papers are publicly available in the archives of the Oklahoma Historical Society in Oklahoma City, Oklahoma.

common was allotted out to individual tribe members, mainly in the area around Rainy Mountain (Sépyàldà). Each head of household was allotted from 80 to 320 acres. This plot of land was an incentive for them to behave more White by farming. More importantly, most of the three-million-acre reservation was not allotted, due to the small tribal population at the time (1,260). All land not allotted was opened up for White settlement. In the eyes of the government, this must have looked like a win-win: Whites got land, Indians got civilization. As a result, Kiowas, along with other Oklahoma tribes that underwent allotment, found themselves scattered on farmsteads throughout the region. This scattering hampered the maintenance of the language.

Another factor in the destruction of the language was the boarding school. According to United States policy, Indian children were sent to schools run by various missionaries, where they were forced to adopt Christian customs and speak English. Attendance was compulsory, and enforced by withholding rations from the students' families. Students caught speaking their native language were swiftly and severely punished.[11] While students did not forget Kiowa during their years at school, the stigma placed on the language led to the students refusing to pass it on to their children, lest they suffer the same indignities. Thus, the chain of acquisition was broken. In fact, many of the speakers now living spent significant time as children with their grandparents, who were often monolinguals, and who spoke Kiowa to them.

Since World War II, the Kiowa tribe has been one of the leaders in the revitalization of Plains Indian culture (Meadows 1999). Unfortunately, this revival has not included a maintenance of the language, in large part because languages are

[11] Parker McKenzie (ms.) notes laconically that the English-only education "hampered our learning of English." Indeed, many students, including Mr. McKenzie, only graduated high school after age 20.

much more difficult to maintain and pass on. Still, there has long been an interest in the language. Kiowa stories often play with language, and many Kiowas have been more than eager over the years to assist linguists. Shamefully, the linguists were not always as kind in return. Several names stand out over the years among the Kiowa, but none more so than Parker Paul McKenzie.

McKenzie was born in 1897, a full generation after the Kiowa tribe was forced onto their reservation. He did not speak English until his schooling began. An apt student, he went on to study at Oklahoma A& M University and Bacone College. He returned home and found employment at the Kiowa, Comanche, and Apache Agency in Anadarko, Oklahoma, sorting through land allotments and aiding monolingual Kiowas with the bureaucracy.

While still a student, he devised a way to write Kiowa, and through years of refinement, completed an orthography to rival that of Sequoyah (see Meadows & McKenzie (2001) for the story in his own words, and Watkins & Harbour (2010)). Despite any lack of linguistic training, his Kiowa orthography is deftly sensitive to the phonology of the language. It gained official recognition in 2003, and is used in this dissertation alongside the IPA. Parker also worked with several linguists and anthropologists over the years. His long and tumultuous working relationship with John P. Harrington led to their *Popular Account of the Kiowa Language* (McKenzie & Harrington 1948). McKenzie's long and harmonious relationship with Laurel Watkins led to *A Grammar of Kiowa* (Watkins 1984), still the best reference grammar of the language. He never completed a dictionary, but he "collected" thousands of vocabulary items from elders and recollections and meticulously catalogued their various forms.

In addition to his language work, he was the most well-respected historian and genealogist of the tribe. Due to his large and varied contributions to the tribe and to science, he was awarded a doctorate *honoris causa* from the University of Col-

orado in 1990. He was extremely proud of this accomplishment, and his diploma is still the first thing you see when you step through his front door. Dr. McKenzie was the last Kiowa to have lived in the 19th century, and nearly made it to the 21st, keeping active until he passed away in 1999.

1.4.3 Reading Kiowa

The Kiowa examples presented in this study are written in two ways: First they are presented as they would be written in the McKenzie orthography, which employs Roman letters, and diacritics marking vowel tone, length, and nasality. Below the orthographic form, examples are presented in parentheses in the International Phonetic Alphabet (IPA), with only high and falling tone marked (blank vowels have low tone).

1.4.3.1 McKenzie orthography

The McKenzie orthography was developed by Parker McKenzie over a long period in the 20th century. Its phonetic accuracy and phonological sensitivity are unparalleled among Kiowa orthographies.[12] It was designed to use only Roman letters and as few digraphs and segmental diacritics as possible. Some of the more striking features is the use of Roman letters found in the English alphabet corresponding to sounds not found in Kiowa. McKenzie employed these to represent sounds found in Kiowa but not English, but did so with a clever nod to the phonological features they have in common.

[12]The McKenzie orthography is not the only one that has been created for Kiowa, or even the only one created by Kiowas. I employ it here for several reasons: It is the most accurate one for segments, it is the only one that includes suprasegmentals, it is the most accurate at delineating word boundaries, and it is to me the most aesthetically pleasing. Unfortunately, no orthography has been accepted by the entire Kiowa tribe, for a variety of reasons (Neely & Palmer, Jr. 2009). The lack of a standard has slowed down every attempt at language revitalization, but there is little hope of concord in sight.

For instance, Kiowa plosives are distinguished by place, of course, but also by voicing, aspiration, and ejection. Here are the Kiowa plosives, written in the IPA on the left, and in the orthography on the right.

labial	b	b	p	f	p^h	p	$p^ʔ$	v
alveolar	d	d	t	j	t^h	t	$t^ʔ$	th
velar	g	g	k	c	k^h	k	$k^ʔ$	q

Table 1.1. Kiowa plosives in IPA and McKenzie orthography

Notice how the replacement letters share a place of articulation with the non-replacement letters— this kind of awareness is sewn throughout the orthography, and is detailed in Dr McKenzie's own account of the creation of the orthography (Meadows & McKenzie 2001), and in Watkins & Harbour's (2010) article about it.

1.4.3.2 Glossing convention

Linguistic glosses for Kiowa examples follow the standard format. The first line is written in the McKenzie orthography. If I elicited the example from a speaker, or had a speaker repeat an example found in a text, there is a second line containing a broad phonetic transcription in the IPA, separated morpheme-by-morpheme. In the McKenzie orthography, verbal agreement prefixes are written separately from their verbs, although they are phonologically attached. Therefore, in the phonetic gloss, they are followed by a dash that signals the attachment.

(6) Ém còdódàuvàidèjàudè

ʔɛ́m– koːʷdó+dɔː+pʔaj-de-tɔː-deː

[2s:3p] a lot+sing+fight-PF-MOD-HSY

'(I hear) you will sing a lot' (f.n.)

If I collected the example from texts or other written sources, and did not have any consultants repeat it, I do not add a phonetic transcription. The first line is in the McKenzie orthography with relevant morpheme breaks added in.

(7) É̱+hàu-dè hê̱jègà gà– dá̱u … qá̱hî̱
this+right here-NOM story [3p] be man
'This is the story of … a man' (Falcon Boy, ms.)

To mark morpheme boundaries, I employ the Leipzig conventions (Comrie et al. 2008), except that when a Kiowa morpheme is translated by a multi-word English phrase (like *kí̱fâu*, 'come out'), I separate the English words with a space instead of a period. The relevant markers of morpheme boundaries are shown in Table 1.2 (between morphemes A and B). If a bound form is separated orthographically from its host, the attachment symbol will be on the bound form.

symbol	**meaning**
A.B	portmanteau
A–B	affixation
A=B	cliticization
A+B	incorporation
A:B	break unclear or irrelevant (e.g. with contractions)

Table 1.2. Morpheme boundary symbols

The glosses are annotated with their source; "f.n." indicates that the examples are from my field notes.

Agreement prefixes in Kiowa are quite complex, reflecting up to three arguments.[13] I will gloss them in a uniform way, depending on the arguments they agree with.

[13]In classes taught at the University of Oklahoma, these prefixes are referred to as 'pronominals'.

argument structure	**convention**	example	gloss
intransitive	[subject]	à ([à])	[1s]
transitive	[subject : object]	gàt ([gʲàt])	[1s:3pn]
intransitive dative	[∅ : subject : dative]	né ([nɛ́])	[∅:3d:1s]
ditransitive	[agent : object : dative]	bágî ([bágîː])	[2d:3p:1s]

Table 1.3. Agreement prefix notation

Abbreviations for the glosses indicate person and number in standard fashion. Number in Kiowa is singular (s), dual (d), plural (p) or inverse (i)[14]. 1st person plural is inclusive (1pi) or exclusive (1px). 3rd person plural (3p) can in some cases be either inanimate (3pn) or animate (3pa). Kiowa agreement forms involve a daunting amount of syncretism (see section 1.5.4.2). The glosses will only include the relevant meaning.

A full list of abbreviations used in glosses can be found in the List of Abbreviations in the frontmatter.

1.4.4 Previous research on Kiowa

Kiowa has attracted interest from linguists in every era of linguistic study, although never very many in number. The earliest known scholarly attempt to understand features of Kiowa grammar were small contributions by Gatschet (1882), in his "The Phonetics of the Kāyowé Language." While his word list did provide some useful information, the regular discrepancies from forms attested not much later suggest that his phonetician's ear was not quite developed.[15]

Ethnographer James Mooney spent a couple of years with the Kiowas, recording oral history published in the seminal *Calendar History of the Kiowas* (Mooney

[14]See section 1.5.4.1 for an explanation of inverse number.

[15]It is of historical interest to note Gatschet's comparison of the apparent 'openness' of Kiowa grammar to their savage roaming around the prairie.

1896), and learning some Kiowa along the way. His concern in recording the language was primarily with a correct understanding of names of people, artefacts, and institutions, but he provides a lot of interesting information.

The first serious scholar of the Kiowa language was the enigmatic ethnologist James Peabody Harrington. While the bulk of Harrington's 'productive' career[16] dealt with the languages of California, Harrington spent quite some time with the Kiowas in the 1910's and '20's, working for the United States Bureau of American Ethnography. He applied his sharp ear and quick wit to recording a vast amount of information. He first suggested a link to the Tanoan language (Harrington 1910), and published the monograph *Vocabulary of the Kiowa Language* (Harrington 1928). The *Vocabulary* offered the first grammatical analysis of the language, and contains many helpful examples that illuminate the usage of the lexical items. Unfortunately, there are some major concerns with the *Vocabulary*, notably Harrington's mishearing many unaspirated [t]'s as [d]'s.

Harrington returned to working on Kiowa in the 1940's, focusing on work with Parker McKenzie. This work led to the publication of *A Popular Account of the Kiowa Language* (McKenzie & Harrington 1948), which gave a more up-to-date view of the grammar, and offered a text of a Kiowa legend. Harrington abruptly terminated his fruitful collaboration with McKenzie in 1949 (we don't know why), and Harrington set his sights elsewhere.

In the 1950's, a group from the Summer Institute of Linguistics, then based in Norman, Oklahoma, conducted extensive fieldwork on Kiowa with a number of speakers. Besides the collection of some texts, their work was published in a series

[16]The scare quotes refer to the fact that Harrington compiled literally tons of information, but published very little of it, wishing rather to devote all his time to fieldwork. Often, he published only under pressure from his employer. He became infamous for the ardor with which he kept his unpublished research out of the hands of other researchers, lest they steal from his work (Stirling 1963; Laird 1975). Much of his research was discovered after his death, squirreled away in secret warehouses.

of articles in the International Journal of American Linguistics. The most notable research result was the elucidation of Kiowa's system of morphological number (section 1.5.4.1). This work carried on into the early 1960's.

In the early 1960's, a series of papers definitively established the historical link between Kiowa and the Tanoan languages, using standard methods of establishing sound correspondences. Miller (1959) proposed a limited set of correspondences, prompting Trager & Trager (1959) to riposte with a reminder of Trager (1951)'s suggestion of such correspondences. Hale (1962) provided extensive evidence for a series of sound correspondences. He also proposed certain features of the proto-language they would have shared.

By the mid 1960's, those who had done research on Kiowa had moved on to other projects. The linguistic study of Kiowa lay dormant until the 1970's, when Laurel Watkins picked it up as a graduate student. Working especially with Parker McKenzie, Watkins produced several articles published in various journals, notably Watkins (1990) and Watkins (1993). Her most comprehensive work was *A Grammar of Kiowa*, written in collaboration with Parker McKenzie (Watkins 1984), which contains the most detailed phonological and morphological analysis to date. Building off her work, Gus Palmer, Jr. has developed Kiowa language courses at the University of Oklahoma, where students can take Kiowa as a foreign language.

More recently, Daniel Harbour has provided a theoretical approach based on the generative Minimalist program. His MIT dissertation on Kiowa's number system Harbour (2007) broke new ground in morphological theory, and his papers on Kiowa syntax Harbour (2003); Adger & Harbour (2007a) have laid the groundwork for more detailed exploration of the phrase structure and morphosyntax of the language. Most recently, Dr Harbour has collaborated with David Adger and Laurel Watkins to write a book that uses Mirror Syntax to derive Kiowa phrase structure Adger et al. (2009).

Many non-linguist Kiowas also work on the language, especially as teachers. Kiowa is taught at several places, including the University of Oklahoma, the Kiowa Tribal Center, and Anadarko (OK) High School. Despite interest in the language from tribal members, no popular dictionary or pedagogical grammar has been published, although some texts have been constructed by Kiowa teachers and students. Also, no book-length collection of Kiowa texts has ever been published.

1.5 A grammatical sketch of Kiowa

The Kiowa language is the empirical focus of this study. This section provides the reader with a primer in the structure of the language, to give the reader a feel for it, and to make reading the examples throughout the text easier to read. Important grammatical details will be brought up at the appropriate times. The information here is a combination of facts presented in previous research on Kiowa (*supra*) , and contributions from my own research.

1.5.1 Typology

Kiowa is a polysynthetic language that can be classified informally as agglutinative. Inflectional morphology is sparse on nouns, but verbal morphology is often quite complex. Many expressions involve intricate methods of compounding, the most notable of which is incorporation.

Pro-drop Kiowa is an argument-drop language. Any argument can be left out of a sentence; in fact, they frequently are. The only required part of a 'complete' Kiowa sentence is the verb and its agreement prefix (8). Watkins (1990) reports stretches in narrative of over twenty consecutive phrases with no nominal arguments.

(8) Áu ā́u

ʔɔ́– ɔ́ː

[2s:3i:1s] give.PF

'You gave it to me' (f.n.)

1.5.2 Syntax

This section will describe the basics of Kiowa syntax to help the reader orient themselves.

Word order Kiowa is classifiable informally as an SOV language. That is, its basic surface word order is Subject-Object-Verb. With three arguments, the basic order is Subject-Indirect Object-Direct Object- Verb.

(9) Yísàum átàdè chē á káun

jísɔ̃m á-t^{h}a-de tsɛ̂ː ʔá= k^{h}ɔ́n

Y. his-wife-his horse [3s:3s:3s] bring.PF

'Yisaum brought a horse for his wife'

Inside nominal expressions, the order is Quantifier-Demonstrative-Noun. Besides demonstratives, there are no overt determiners.

(10) jé́ úigàu chēgàu

téː ʔúj-gɔ tsɛ̂ː-gɔ

all that-INV horse-INV

'All those horses'

There is no category for adjectives; adjectival modification occurs in two ways: A verb is compounded to the noun (11), or a relative clause is used (12).

(11) mátàunsyàn

mátɔ̃n+ʃ̃ãn

girl+(be) little

‘little girl’

(12) mát<u>ā̀</u>udàu è syángàu
máɔ̃̃ː-dɔ ʔe– ʃã́n=gɔ
girl-INV [3i] (be) little=NOM.INV
‘(3 or more) little girls’

Kiowa relative clauses are head-internal; essentially they are sentences with a nominalizing particle postposed to the verb. This particle agrees in morphological number with the head noun, as in (12). Thus, in (13), the inverse marking on the nominalizer *-gàu* indicates that the head noun is ‘women’, not the boy.[17]

(13) Tā̀lī́ màyóp é bṓ̱gàu è thā́gà.
[tʰaːlíː may-óp é– bɔ̃́ː]=gɔ ʔe– tˀáːgʲa
boy woman-INV [3s:3i] see.PF=NOM.INV [3i] good
‘The women the boy saw are good.’ / *‘The boy who saw the women is good.’

Adpositions in Kiowa are postpositive, either on nominal expresssions or on clauses. They are encliticized to the noun phrase, or the rightmost constituent in the clause.

(14)	fáife=bè	south=along	‘along the south’
(15)	máun=jò	hand=with	‘with the hand’
(16)	èm kī́fā̀u=dò	[2s]– leave.PF=since	‘since (because) you left’

Questions Kiowa uses a yes/no question particle, *hàu* ([hɔ]), which is sentence-initial, except for topics. Wh-words are obligatorily fronted.

[17] Watkins (1984) shows that some relative clauses head nouns can be extraposed, with the relative clause itself moved to a postverbal position.

(17) Hàu tā̀lī́ màyóp é bṓ̱gàu è thā́gà.

hɔ [tʰaːlíː may-óp é– bṓːʷ]–gɔ ʔe– tʔáːgʲa

Q boy woman-INV [3s:3i] see.PF-NOM [3i] good

‘Are the women the boy saw good?’ (f.n.)

(18) Hâjêl tā̀lī́ bṓ̱?

hâːtêːʲl tʰaːlíː ∅– bṓːʷ

who boy [3s:3s] see.PF

‘Who did the boy see?’ (f.n.)

Discourse configuration Kiowa word order is not strictly tied to argument structure. It isn’t truly ‘free’, though. Word order can vary for discourse purposes. Topics, especially contrastive ones, can be left-dislocated, even beyond question words. Many given constituents are right-dislocated to the post-verbal domain.

(19) Cút, John gà hā́ugà.

kúʔ J. gʲæ– hɔ́ː-gʲæ

book J. [3s:3p] buy-PF

‘The book, JOHN bought.’ (f.n.)

(20) John gà hā́ugà cút.

J. gʲæ– hɔ́ː-gʲæ kúʔ

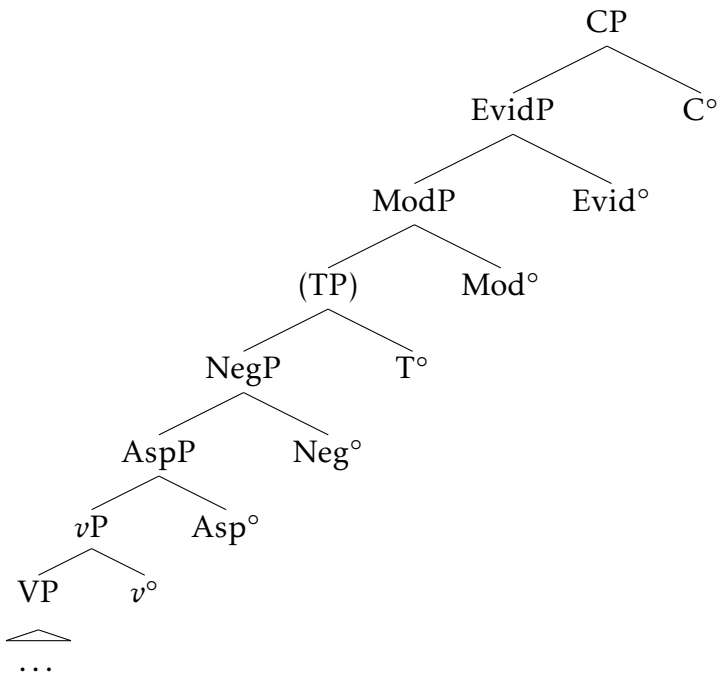
J. [3s:3p] buy-PF book

‘John bought it, the book’ (f.n.)

1.5.3 Phrase Structure

Adger & Harbour (2007a) note that the postverbal functional morphology directly mirrors the standard syntactic hierarchy of the projections corresponding to these morphemes. That is, the innermost (to the verb stem) morpheme is the lowest, and so on as you head away from the stem. This leads to a phrase structure like the one in (21):

(21)



This tree assumes a right-headed structure. Recent developments in syntactic theory (Kayne 1994) argue that all structures are in fact left-headed; apparent right-headedness is derived via movement operations. There is Kiowa evidence pointing toward left-headedness. For instance, we have seen that quantifiers and demonstratives precede their accompanying noun phrases. If these are heads, and not adjoined DPs or QPs, perhaps QPs and DPs are left-headed. In addition, the yes/no question particle is found sentence-initially. Assuming the standard account placing yes/no question particles at C°, we can suspect that at least some CPs are left-headed.[18]

(22) Hấu Yísàum átàdè chê̲ á káun?

hɔ́ː jísɔ̃m á+tʰa-de tsə̂ː ʔá– kʰɔ́̃n

Q Y. his+wife-NOM horse [3s:3s:3s] bring.PF

'Did Yisaum bring a horse for his wife?'

[18]This suspicion may not be warranted after all, as discussed in section 4.4.2.

That said, this dissertation will maintain a right-headed analysis, for two reasons. The first is that headedness is not crucial to the analysis of switch-reference; either way will work. Second, assuming left-headedness would simply add to the assumptions requisite for a working model, thereby increasing the theoretical and expositional cost, with no concordant benefit.

1.5.4 Morphology

Kiowa morphology is generally agglutinative and suffixal. There are many key exceptions, though. Many nouns and verb morphemes involve fusion or partial fusion. So does switch-reference. Verb agreement is always prefixed. Some inflectional morphemes, like the habitual marker, are free forms. This section will focus on the morphological processes that occur most frequently in the examples presented in this dissertation.

1.5.4.1 Nominal morphology.

Nominal morphology consists only of number marking, which reveals the nominal class. There is no case marking. Kiowa exhibits a curious mismatch between morphological and semantic number marking that has long attracted the attention of linguists. Kiowa nouns have three semantic numbers: singular, dual, and plural. However, almost no noun has more than two forms.[19] Up to two of these forms are marked, the rest remain unmarked.

Kiowa nouns can be classified broadly by the correlation between semantic and morphological number on the noun, and in the agreement form. For Class I, the marked number is plural. For Class II, the marked number is singular. Class IV has no markings at all, and Class III marks singular and plural. Class III only has four attested members, and has no cognate class in the related Tanoan languages.

[19]The key exceptions are nouns with the compound forms meaning 'big', which are +èl, +bîn, and +bi̱dàu.

class:	Class I	Class II	Class III	Class IV
noun:	**yáucáui**	**áivìé**	**ā́lā̀u**	**áisè̱gà**
gloss:	‘young woman’	‘potato’	‘apple’	‘smoke’
singular:	yáucáui	áivìégàu	ā́lā̀ubàu	áise̱gà
dual:	yáucáui	áivìé	ā́lā̀u	áisè̱gà
plural:	yáucáuigú	áivìé	ā́lā̀ubàu	áise̱gà

Table 1.4. Kiowa nominal number morphology

Wonderly et al. (1954) called the unmarked form the ‘basic’, and the marked form the ‘inverse,’ building off the semantic correlations in Classes I and II. Class I nouns tend to be animates, and Class II nouns tend to be inanimates. These classes are productive in this sense. Abstract and deverbal nouns are in Class IV. Morphologically, of course, the terms ‘marked’ and ‘unmarked’ may be more neutral, but Kiowa scholars use basic/inverse, and this study will stick with these (see Harbour (2003, 2007) for a thorough discussion).

1.5.4.2 Verb morphology

Verb agreement Verbal inflection consists of a prefixed agreement marker, and post-stem inflection. The agreement prefix is a crucial component of the Kiowa sentence. Any complete sentence must contain a verb inflected by agreement. Verbs agree with up to three arguments: an agent, an ‘absolutive’ argument, and an oblique argument. The term ‘absolutive’ is used here without making a theoretical claim; it simply stands for ‘intransitive subject or transitive object.’ It correlates to the structural notion of internal argument, and should not be understood as implying ergativity. These agreement morphemes are portmanteaux, often to an extreme level. For instance, in (23), the agreement form is just one vowel, but it indicates that ’you X it to me’.

(23) É ā́u.
ʔé– ʔɔ́ː
[2s:3s:1s] give.PF
'You gave it to me.'

The decomposition of these markers was a significant contribution of Watkins (1984)'s descriptive grammar. This decomposition required mixing diachronic and synchronic processes, so we cannot assume any synchronic composition of these particles; they must have been acquired whole. Harbour (2003, 2007) provides a feature-based morphological analysis that decomposes them more completely.

Not only do agreement markers contain a lot of information, they also involve enormous amounts of syncretism. The sentence *Dét ā́u* can be translated in dozens of ways, because the agreement prefix *dét* can point to dozens of agents and several different objects and recipients. Depending on the context, this expression can mean one of the following:

(24) *Dét ā́u* ([déʔ–ʔɔ́ː]) =
They (two) gave them (dual) to you (sing)
We (dual, excl) gave them (dual) to you (sing)
We (excl) gave them (dual) to you (sing)
They (plural) gave them (dual) to you (sing)
They (inverse) gave them (dual) to you (sing)
Any subject gave them (dual) to us (dual)
Any subject gave them (dual) to us (plural)

Notice the last two meanings of *dét ā́u*, which involve 'any subject', minus first person. 'Any subject' entails many additional meanings for this agreement form. This

syncretism raises interesting questions concerning acquisition and processing.[20] It is also relevant for the methodology of this study. When eliciting judgments and production, I took pains to employ as many sentences as possible with overt arguments, to avoid any misinterpretation or ambiguity that syncretism would lead to.

Tense/aspect/mood inflection The postverbal morphology indicates the values of various functional categories that describe properties of the event the verb describes. The ordering of these morphemes is demonstrated in Table 1.5.

VERB	-aspect	-negation	-modality	-evidentiality
à̱um	∅	àu	-jàu	-dè
ɔ̃.m	∅	ɔː	tɔ̀ː	-dèː
make	(PF)	NEG	MOD	EVID

'(someone told me) X won't make'

Table 1.5. Post-verbal morphology template

Kiowa has no tense morphology. Modality marking is used to indicate future times, but it also indicates deontic modality, and conditionals (Watkins 1984; Baker & Travis 1997). It has two forms: *thấu* ([t'ɔ́ː]) is used on intransitive verbs, and *jấu* ([tɔ́ː]) is used on transitive verbs.[21] Evidentiality covers knowledge not gained by direct perception, including any reported knowledge.[22] My consultants found evidential marking necessary for knowledge learned by watching TV, even from people visible on screen.

[20]Unfortunately, the fact that no children currently acquire the language make questions about acquisition unanswerable, perhaps forever.

[21]The transitive modal is homophonous with the verb meaning "stay at" or "be at." The intransitive modal is homophonous with the verb meaning "act, behave." I am unaware if this is more than coincidence.

[22]This evidentiality is often called "hearsay mode" in the descriptive literature.

Incorporation. Incorporation is a common way to build words and phrases in Kiowa. In the verbal domain, incorporated items include internal arguments, compounds, control clauses, certain adverbials, and certain bound verbal stems (Watkins 1984; Adger & Harbour 2007a; Adger et al. 2009). In the nominal domain, possessors incorporate onto the possessum, and compounding involves incorporation. In all cases but one, the incorporated item is preposed. The exception is when a verb modifies a noun adjectivally.[23] Several items can be incorporated at once, as the examples in Table 1.6 shows.

example	Kiowa	gloss	English
internal argument	cút+hấugà	book+get	'get books'
verbal compounds	cút+á̱gà	book+sit	'go to school'
control clauses	cí+hấugà+jét	meat+buy+send	'send to get meat'
adverbial stems	kàulé+bấ	together+go	'go together'
bound verbal stems	dê+qấu	sleep+lie down	'be sleeping'
possesors	nấu+tấ	me+wife	'my wife'
compounds	jémáun+cấudòkī̱	ten+hundred	'thousand'
adjectivals	mátàun+syân	girl+small	'little girl'
complex	tő̱+áulkáui	water+crazy	'whiskey'

Table 1.6. incorporation examples

Some Kiowa verbs are compounds composed of some stem incorporated with the stems *vấidè* ([p'á:jde]), meaning 'fight', or *jấu* ([tó:]), meaning'act' or 'behave a certain way'. The exact semantic contribution of the act/fight stem seems to be aspect— 'fight' is perfective, while 'act' is imperfective (Watkins 1984).

Other aspects of Kiowa grammar will either be raised as we go along, or omitted from this dissertation. This brief sketch should provide you with a feel for the

[23]One other possible exception is the use of auxiliary verbs. I suppose that it might be possible that in a noun+verb compound, it is the noun that modifies the adjectival verb. A word like *fī̱èl* ([pí̱+el]) which means 'feast, Thanksgiving', is composed of the roots 'food+big'. We assume that 'big' is modifying 'food', but since both are properties of the noun, it might be the other way around.

Kiowa	IPA	*English*
dáuvàidè	dɔ́ː+pʔajde	'sing'
kúvàidè	kʷúː+pʔajde	'have a fistfight'
sǫ́gavàidè	sǫ́ːgʲa+pʔajde	'flirt'
sáujévàidè	sɔ́ːtépʔajde	'work'
jǫ́vàidè	tǫ́+pʔajde	'talk, chat'
tólvàidè	tʰóːl+pʔajde	'have sex'

Table 1.7. Some act/fight verbs in Kiowa

language, and a sense of what to look for in the examples, and where to look for them.

1.6 Conclusion

This chapter has introduced the major questions that this investigation aims to answer, and the methodologies used to do so. It also introduced the Kiowa language. The next chapter will introduce the main empirical phenomenon of the dissertation, switch-reference, from a cross-linguistic perspective.

CHAPTER 2

A SURVEY OF SWITCH-REFERENCE

This chapter introduces the reader to switch-reference and discusses important cross-linguistic generalizations of the phenomenon that must serve as the basis of any attempt to theorize about it. It also refutes several generalizations that have appeared in the switch-reference literature. In doing so, it underlines the impossibility of generalization based solely on the morphosyntax of the SR-morphemes.

Section 2.1 introduces the phenomenon and discusses the terminology used to describe it. Section 2.2 is a cross-linguistic exploration of the morphological and syntactic facts about switch-reference. It demonstrates that little can be discerned from these facts alone. Section 2.3 lays out the components of a theory of switch-reference, notably the kinds of facts one should account for. Section 2.4 presents Finer's (1984) influential theory of switch-reference based on the Binding Theory. It also exposes crucial flaws that undermine its applicability. Finally, section 2.5 summarizes the findings of this chapter, and highlights the necessity of examining the semantics of switch-reference.

2.1 Introduction to switch-reference

Switch-reference is a morpheme found at the juncture of two clauses that typically indicates whether the subjects of those two clauses co-refer. For instance, in Kiowa, there are two sentential connectives translated as *when*. When the subjects of the two joined clauses co-refer, the form of *when* is *ch̲ȅ* (/tsẽː/), glossed as SS, as seen in (25). When the subjects are disjoint, the form is *ȅ̲* (/ẽː/), glossed as DS (26).

(25) Hébà**chē̲** èm sáu.

[∅– hé꞉bà=tsẽ꞉] ẽm– sɔ́꞉

[3s]– enter.PF=**when.SS** [3s:RFL]– sit down.PF

'[When she$_1$ came in], she$_{1/*2}$ sat down.'[1] (Kiowa, field notes)

(26) Hébà**ē̲** èm sáu.

[∅– hé꞉bà=ẽ꞉] ẽm– sɔ́꞉

[3s]– enter.PF=**when.DS** [3s:RFL]– sit down.PF

'[When she$_1$ came in], she$_{*1/2}$ sat down.' (Kiowa, f.n.)

2.1.1 Origins of the study of switch-reference

Jacobsen (1967) first proposed the term *switch-reference* to describe a proposed morpheme of Washo (Hokan-Coahuilan, California) that only appeared at the juncture of two clauses whose subjects were disjoint in reference. The term *switch-reference* referred to this apparent switch. The morpheme in question, *-š* ([ʃ]), appears in (27) cliticized to a sentence-initial particle, itself cliticized to a sentential coordinator.

(27) gáhɨla Máhaduwetihayi. ʔ–**iš**da šáhadueʔi

her:leg she:lay across and–there:SR she:went across

(no gloss provided) (Washo, Jacobsen (1967))

Jacobsen's insight proved quite helpful for linguistic documentation, for soon, linguists applied his description to morphemes in many more American languages, as well as hundreds more in Papua New Guinea, Australia, and around the world. In many languages, linguists found another morpheme that was in complementary distribution with the switch-reference morpheme, only appearing at the juncture of two clauses whose subjects co-referred.

[1] In both (25) and (26), the pronouns could also be translated as 'he'.

This identity-maintaining morpheme received various names, the most common being *same-reference*. For instance, in Mojave (Munro 1976: 39), *-k* marks same-reference, while *-m* marks switch-reference.

(28) a. pap ʔ-əkčo:r-**k** ʔ-salʸi:-k
potato 1-peel-SS 1-fry-TNS
'I peeled the potatoes and then I fried them'

b. ʔinʸeč pap ʔ-əkčo:r-**m** Judy-č salʸi:-k
I potato 1-peel-DS Judy-NOM fry-TNS
'I peeled the potatoes and then Judy fried them'

2.1.2 Terminological issues

As these morphemes were being discovered in and described for more and more languages, somewhere along the way, the term *switch-reference* underwent a shift in meaning. Munro (1976) uses it as a "cover term" (p. 41) to describe the phenomenon that includes both the same-reference and switch-reference morphemes. To avoid subsequent confusion, Munro describes the morpheme Jacobsen that called 'switch-reference' as *different subject* or DS, while 'same-reference' became *same subject* or SS. Both terms are intended to reflect the observation that switch-reference 'tracks' the reference of subjects from one clause to the next. In the literature, it is common to say that switch-reference tracks subjects.

This terminology is still in use today, even though later research demonstrated that switch-reference does not solely track subjects. Chapter 3 will discuss this 'non-canonical' switch-reference in detail, but even as early as Langdon & Munro (1979) and Dahlstrom (1982), it was noted that switch-reference seemed on occasion to track a topical event, rather than any of the participants described. Stirling (1993) proposed a semantic structure whereby switch-reference only tracks the verb's Davidsonian event, and I will argue that what is being tracked in those cases

is the topic situation of the joined clauses. Despite the fact that switch-reference sometimes ignores subjects, I will continue to use SS and DS to describe the values of the morpheme. The names only exist in the linguist's models, so they ought to be used for the linguist's convenience, and I judge continuity to be convenient enough to keep using these terms. If one seeks further justification, one might imagine that SS and DS are orphan initialisms that no longer stand for anything in particular, or that SS stands for 'same something', and DS for 'different something' (Craige Roberts, p.c.).

Switch-reference the phenomenon and switch-reference the morpheme are often indiscriminately abbreviated in the literature as SR, especially in journal articles, where space is scarce. With no such constraint here, I will, in the interest of clarity, distinguish the two. I will only use SR to describe the switch-reference morpheme, independent of its value, and write out "switch-reference" to describe the phenomenon itself. Accordingly, switch-reference is marked by an SR morpheme, which can exhibit either SS or DS marking.

2.1.3 Pivot and anti-pivot

Switch-reference doesn't always track subjects, so we need a way to refer generally to the item it does track. I will adopt Stirling (1993)'s term *pivot* as a cover term for the various kinds of things this argument can be. But I will diverge from her usage, and introduce the term *anti-pivot*, which I explain below.

SR markers sit at the juncture of two clauses, but it does not have the same relation with the two clauses. All clause juncture types are asymmetric, and SR morphemes are necessarily a constituent embedded within one clause or the other. Therefore, switch-reference is an asymmetric phenomenon as well. For instance, in (25) and (26), the SR morpheme is fused with the connective, which is syntactically a part of the embedded clause. An SR morpheme relates two arguments;

one is its clausemate, while the other is not. Thus, neither the two clauses nor their prominent arguments share an identical structural relation to the switch-reference morpheme.

This asymmetry will turn out to be important, so it is necessary to distinguish the two arguments of switch-reference. Therefore, throughout this dissertation, I will employ the term **pivot** to describe the clausemate argument of SR, and introduce the term **anti-pivot** to describe the non-clausemate argument. An SR morpheme exhibits SS marking when its pivot and anti-pivot arguments co-refer. It exhibits DS marking when they don't.

In addition to describing the arguments of SR as *pivot* and *anti-pivot*, we will need to distinguish the two joined clauses. I use the term **pivot clause** to describe the joined clause that contains the pivot (along with the SR morpheme), and **anti-pivot clause** to describe the joined clause containing the anti-pivot. The main reason for this usage is to link the terms to the relations borne by the arguments that switch-reference tracks to the switch-reference morpheme itself. In (25) and (26), the pivot of the switch-reference marker is typically the embedded subject, and the pivot clause is the embedded clause. The anti-pivot of the switch-reference marker is typically the dominant clause's subject, and the anti-pivot clause is the dominant clause.

A secondary reason for this terminology is neutrality with respect to the structure. Haiman & Munro (1983) employ the terms *marked clause* for the clause with SR (the pivot clause), and *controlling clause* for the other clause (the anti-pivot clause). While these terms have been widely used in the switch-reference literature, they presuppose dependencies between the clauses that rely on particular theories of grammar. The use of pivot/anti-pivot clause makes no such suggestion, freeing us to pursue whichever structure analyses our observations lead us to.

2.1.4 Anti-pivots seem to be pivots as well

One important observation that Jacobsen (1967) made about switch-reference is that the pivot of one SR morpheme serves as the anti-pivot of an SR morpheme embedded under it, and that the anti-pivot of an embedded SR morpheme serves as the pivot of an SR morpheme in its own clause. This effect is visible when several clauses are linked by SR morphemes. In the Kiowa example in (225), the subject of the third clause is *pro*, but DS marking indicates a change from the subject before it. It may be the first sentence's subject, or it might be another person altogether. In (225), the second clause is the pivot clause of the first SR marker, as well as the anti-pivot clause of the second.

(29) Yísàum hébàhèl **nàu** dónhêl **nàu**

jíːsɔ̃m ∅– héːʲb-a-hel nɔ̃ ∅– dɔ́n-hêl nɔ̃ ∅–

Y. [3s] enter-PF-EVID and.DS [3s:3s] look at.PF-EVID and.DS [3s:3s]

jɔ́nê…

tɔ́ːʷ-nɛ̂ːʲ

say.IMPF.EVID

'Yisaum$_1$ came in and he$_{*1/2}$ looked at him and he$_{1/*2/3}$ said…' (f.n.)

This property of pivots appears so evident that it might seem barely worth mention. However, in section 4.5.2, I show that in certain configurations, the anti-pivot cannot be the pivot of its own clause. This observation will follow from the proposal that switch-reference can track topic situations, rather than subjects. However, in many cases, Jacobsen's observation still holds, and any theory of switch-reference must account for that.

2.1.5 Disambiguation does not trigger switch-reference

If we look at examples (25) and (26) again, we see that there are no overt arguments in either clause. In (25), the SS marking on the connective is the sole

overt indication that the person who came in is also the person who sat down. In (26), the DS marking is the only overt indication that someone else sat down. The English translation of both sentences, when spoken, is ambiguous, so from our perspective, the switch-reference is performing a helpful disambiguating function.[2] This use of switch-reference can be very useful in texts involving two characters, as it allows listeners to track who's doing what (Watkins 1990). Indeed, for a long time, many researchers considered this pragmatic effect he primary function of switch-reference (Moser 1978; Langdon & Munro 1979; Haiman & Munro 1983); they claimed that SR is licensed by the need to disambiguate.

However, there is no clear link between discourse function and licensing of switch-reference. Finer (1984) points out that switch-reference's distribution is grammatically determined, because it appears when it does not help disambiguate. A pair of Kiowa examples demonstrates his point. The subject in both clauses of (30a) is the first person singular, which is clearly distinguished in the verbal agreement marker. There can be no ambiguity among the subjects, but SS-marking with *when* is obligatory, as proven by the negative evidence in (30b).

(30) a. À hébà**chē** dè sáu.
ʔa-hé꞉ba=tsẽ꞉ de-só꞉
[1s]-enter.PF=**when.SS** [1s:RFL]-sit.down.PF
'When I_i came in, $I_{i/*j}$ sat down. ' (f.n.)

b. *À hébà**ē** dè sáu.
ʔa-hé꞉ba=ʔẽ꞉ de-só꞉
[1s]-enter.PF=**when.DS** [1s:RFL]-sit.down.PF
'When I_i came in, $I_{i/*j}$ sat down. ' (f.n.)

[2]It should be noted that the prosody of English usually gives a disjoint-reference effect that disambiguates the sentence. When the two subjects differ, the second tends to be pronounced with greater intensity due to contrastiveness.

Furthermore, the kind of ambiguity that ought to trigger switch-reference does not automatically do so. Two sentences can be joined by a connective that does not mark SR; in this case none appears. For instance, the Kiowa connective *-dò*, 'because', does not allow SR marking, even if it would disambiguate the sentence.

(31) Háun chā̱́nâu kópdàu**dò**.
hɔ̃́n ∅– tsã́ːn-ɔ̂ [∅– k^{h}óp+dɔː=do]
not [3s] arrive-NEG [3s] sick+be=because
'(He/she)$_1$ didn't come because (he/she)$_{1/2}$ was sick.' (f.n.)

What determines the appearance and value of SR is the effect of the interaction between the lexicon, the syntax, and the semantics. SR is found with, borne by, or fused with certain sentential connectives, and it appears if and only if those connectives are used. The pragmatic usefulness of disambiguation that SR ultimately provides is epiphenomenal.

2.1.6 Where switch-reference is found around the world

This dissertation is focused on the Kiowa language, but any theory of switch-reference needs to be compatible with what is known about switch-reference cross-linguistically. The next section offers a cross-linguistic discussion of switch-reference morphosyntax. Before we can begin that, let us begin with a discussion of where switch-reference is found around the world, to see just how cross-linguistic the investigation must be.

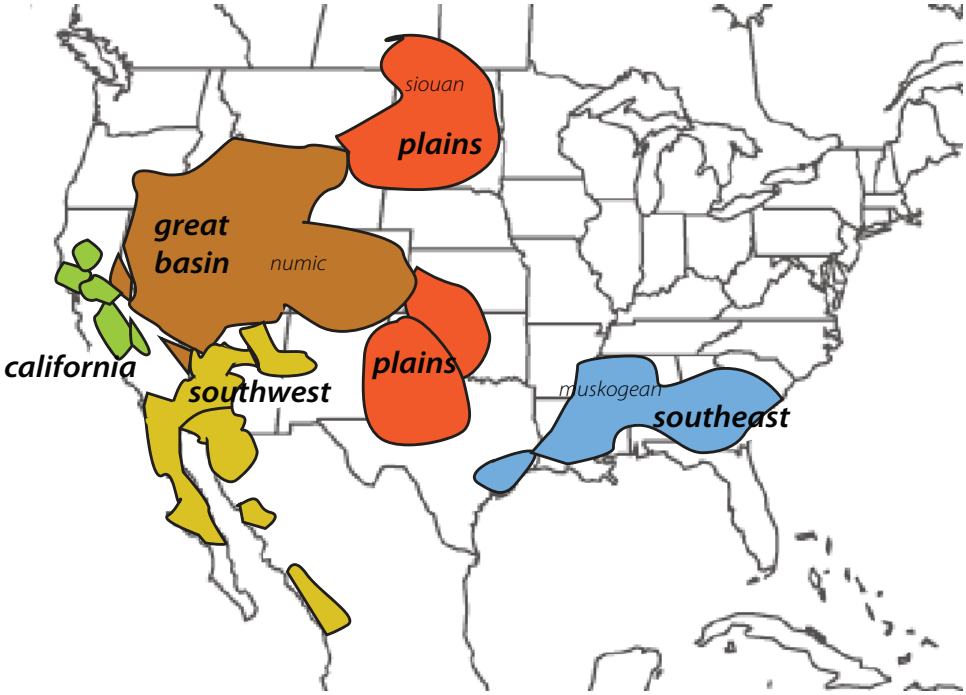
Switch-reference is found in hundreds of languages on several continents. For convenience, these are called switch-reference languages, or SR-languages. The most detailed studies have been made on SR-languages in Papua New Guinea, Australia, and North America. However, switch-reference also been attested in South America (Dixon & Aikhenvald 1999), in East Africa among the Omotic languages of Ethiopia (Azeb Amha 2001), and in the Munda languages of Eastern India (An-

derson 2007). Typologies of markings and usage of switch-reference have been published for North America (Jacobsen 1983), for Australia (Austin 1981), and for Papua New Guinea (Roberts 1997). Switch-reference is unattested in Mesoamerica (Campbell 1997) and the Caribbean, as well as anywhere else not mentioned, including no language of Europe. In North America it is found in many different cultural areas and language groups, including Muskogean, Yuman, Numic, Siouan, Pomoan, and Piman. The map in Figure 2.1 shows the pre-contact distribution of known switch-reference languages in North America.[3] The languages are found in several cultural areas, though notably none in the Northeast. In fact, no Algonquian or Athapaskan language employs switch-reference. This may be related to the fact that many languages in these groups have obviation systems (Mithun 1997).

Some researchers have reported switch-reference in Bantu languages (Wiesemann 1982), the Caucasus (Nichols 1983), and on the island of Vanuatu in the South Pacific (Crowley 1998). However, these reports concern phenomena that provide a **switch-reference effect**, but do not themselves involve a switch-reference morpheme. Many phenomena have the effect of indicating subject identity or disjointness. However, they do this using a syntactic phenomenon that is licensed by co-reference, instead of using an actual grammaticalized morpheme that marks co-reference or disjointness. For instance, obligatory subject control in English (e.g., *We$_1$ want PRO$_1$ to have lunch.*) triggers a same-subject effect, but does not involve switch-reference. Switch-reference effects and the ways they are used in language to mimic reference-tracking are very interesting. I discuss one example in section 4.3.3, but by and large these effects fall outside the scope of this study and will be left alone for now.

[3]See Austin (1981) for a map of Australian SR languages, and Roberts (1997) for a map of Papuan SR languages.

Figure 2.1. Pre-contact speech areas of known switch-reference languages in North America (based on the language area maps in Campbell (1997))



This section has introduced the phenomenon known as switch-reference. It tracks a clausemate argument (the pivot) and a non-clausemate argument (the anti-pivot), and indicates whether they co-refer (SS marking) or are disjoint from one another (DS marking). The anti-pivot of one SR marker is usually the pivot for an SR marker in its own clause. The SR morpheme must appear with certain sentential connectives, whether it aids in disambiguating subjects or not, and must not appear elsewhere. The next section examines the distribution of SR morphology in more detail, including the types of connectives it is found with.

2.2 A cross-linguistic examination of SR morphosyntax

This section examines the morphosyntax of SR morphology from a cross-linguistic perspective. It demonstrates that morphosyntactic generalizations alone do not inform us much about the nature of switch-reference. This nearly null finding

suggests that the semantics of switch-reference is at least as crucial to its understanding as its syntax, thereby setting up the analysis in the subsequent chapters of this dissertation.

The most important cross-linguistic generalizations that can be made about switch-reference morphology are that the morphemes always appear at clause junctures. In a structural sense, SR only occurs at the edge of an extended verbal projection. SR morphemes form their own category. In most SR-languages, an overt sentential connective is required for SR to attach to. These facts about the distribution of switch-reference must be accounted for.

2.2.1 Morphology of switch-reference morphemes

This section will ask whether we can uncover any other informative cross-linguistic generalizations about the distribution of SR morphemes. Some linguists, focused on one language or family of languages, have proposed that we can, but a broad enough view proves the opposite. Apart from a requirement for SR to appear at clause junctures, we cannot make any generalizations based on the forms or distribution of the SR morphemes themselves, nor can we rule out any particular structure of clause juncture that switch-reference might appear with.

2.2.1.1 SR is not nominal

SR is not a nominal morpheme. In a strictly morphological sense, it does not belong to the class of morphemes that are typically associated with nouns, including number, gender, or case marking. In no language has it been attested to appear affixed to the nominal expressions it is tracking, or any other nominal expression. In addition, it does not license any specific morphology on them (via a syntactic agreement relation). In a syntactic sense, a nominal morpheme is one that is introduced by a head within an extended nominal projection (notably, NP and DP). Switch-reference is not nominal in this sense. It never appears inside a DP or NP,

unless it is on a relative clause within one; in that case it is found at the edge of the relative clause, which contains an extended verbal projection.

There are two cases that at first glance appear to be exceptions: SR markers that cliticize onto nouns, and quantifiers. The first apparent exception is exemplified by Kiowa. Kiowa is typically verb-final but allows right-dislocation.[4] A right-dislocated DP can serve as the phonological base for the cliticized postpositive that bears switch-reference. This is shown in (32a), where the DP meaning 'pencil' is right-dislocated. Without right-dislocation, the SR-marked connective cliticizes to the clause-final verb (32b).

(32) a.

John	é	zón	cútā̱́dàu**chḕ̱**,	é	têm.
J	é–	zṓn	kúʔ+áː–dɔ=tsẽː	ʔé–	tē̂m
J.	[3s:3i]	pull out.PF	write+stick-INV=when.SS	[3s:3i]	break.PF

'When John pulled it out, the pencil, he broke it (in two).' (f.n.)

b.

John	cútā̱́dàu	é	zón**chḕ̱**,	é	têm.
J	kúʔ+áː–dɔ	é–	zṓn=tsẽː	ʔé–	tē̂m
J.	write+stick-INV	[3s:3i]	pull out.PF=when.SS	[3s:3i]	break.PF

'When John pulled out the pencil, he broke it (in two).' (f.n.)

The fact that *=chḕ̱/ḕ̱* is a clitic tells us that its attachment to the noun *cútā̱́dàu* is phonological in nature, not syntactic— the SR is marked on the connective, not the noun.

Another apparent example comes from quantificational constructions, as seen in (33) and (34). However, independent facts about these quantifiers show that

[4] Kiowa's basic word order is SOV (Watkins 1984). According to standard practice in the generative literature, 'basic word order' simply describes the word order that would derive from the syntactic structure before any demonstrable movement operations take place. So English is a Subject-Verb-Object (SVO) language, which makes *Bill likes coffee* grammatical. However, movement can displace objects for various grammatical purposes. If you want to evoke a contrast, an OSV order is possible: *Coffee, Bill likes. Tea, he doesn't.* This contrastive mechanism 'left-dislocates' the object, because it moves the contrasted item to the left-edge of the clause.

they are actually verbs, and the quantifier phrases are actually sentences (extended verbal projections). (33) can be paraphrased as 'them being all, you will eat them', while (34) can be paraphrased as 'the boys were all and they met at church.' Broadwell (2006) notes that quantificational verbs in Choctaw can take tense and aspect, bear agreement markers, and be embedded under participial and complementizing morphemes, which bear switch-reference. Indeed, in (34), the universally quantifying verb *mo̲ma* is inflected with an intensive marker (the geminating 'y-grade' infix), that gives the sense of 'every single one'.

(33) [po-kóo **ta**] in-síi-ʔʔiit-aʔa
DepFut-be all DS.DepFut 2-fut-eat-TM
'You will eat them all' Seri, (Moser 1978: 114)

(34) [Alla'a nakni' móyyoma-ka-**t**] oklah aa-ittanáaha-' itt-afaama-tok
child male all:Y-comp-SS plur loc-meet-nml rcp-meet.past
'All the boys met at church.' Choctaw, (Broadwell 2006: 226)

The absence of any effect of switch-reference on nominal morphology is important for two reasons. First, it suggests that there is no inherent link between the SR morpheme and subjects, a suggestion that will be confirmed by investigations of non-canonical switch-reference (chapter 3). The second is that this absence makes switch-reference significantly different from other reference-tracking devices it is often compared to, such as logophoricity, pro-drop, or obviation. These others all involve changes in the form of the DP in question, either through special pronouns or a morpheme replacing case marking, and the effects often re-appear in verb agreement. This difference ought to be accounted for by any theory of SR.

2.2.1.2 SR is not (pre-theoretically) verbal

In the literature, a consensus seems to have formed by Haiman & Munro (1983) that SR is a verbal morpheme, in a family with tense, agreement, aspect, and mood,

because it generally tracks subjects and is generally found affixed to verbs. This description-based use of the term 'verbal' differs from its use in syntactic theory. In a theoretical sense, 'verbal' describes a morpheme that heads a lexical or functional projection that 'extends' from the verb phrase. These morphemes include tense, agreement, aspect, and mood, which may appear on the verb, but if they do, the appearance is derived by the effect of independent syntactic processes.

If we apply the descriptive sense, switch-reference cannot be characterized as verbal, since it is not necessarily affixed to verbs, and it doesn't always track subjects. Jacobsen noted in his seminal (1967) paper that switch-reference morphemes can appear affixed to sentence-initial particles instead of sentence-final verbs. The following example from Washo demonstrates this, with an initial particle he glosses as 'X'.

(35) píteliʔ yát'umuwaʔ-aʔ ʔ-i-š-da géwe geʔišúwam-i-da
lizard go down in-AOR X-IMPF-DS-LOC Coyote pursue him-IMPF-DS
'The lizard went in and then Coyote pursued him and...' (Washo, Jacobsen 1967)

A possibly effective reply to Jacobsen's observation is that these sentence-initial particles are actually verbs. Many languages employ recapitulative pro-verbs in sentence-initial positions to express some kind of narrative continuity to previous sentences. This may be the case here, and the imperfective marking is strong evidence to that effect. If this reply is correct, (35) does not disprove the notion of SR as descriptively verbal. No matter; the accuracy of Jacobsen's observation is unnecessary for us to address this question. Many languages provide ample counterexamples that are much more clear than the Washo case. For instance, in many languages, switch-reference is affixed to or fused with coordinating conjunctions. One such language is Kiowa (Watkins 1984). In (36), switch-reference appears on

the coordinating conjunction *gàu* ([gɔ]), which is not attached to the sentence-final verb.

(36) Bé yâivàidè **gàu** bé dấufènàum
bé= jâj+pˀajde gɔ bé= dɔ́ː+pẽn+ɔ̃m
[2p:RFL] play+fight.PF.IMPER **and.SS** [2p:3pa] kill+fire+make.PF.IMPER
'Y'all play, and then burn them to death.' (Kiowa, f.n.)

This detachment is quite clear in cases where the coordinated clause is used with respect to a previous utterance, even if each conjunct is spoken by a different speaker. Example (37) involves the form *gìgáu*, which is a contraction of the SS coordinator *gàu* with the adverbial *hègáu* ([hegɔ́]). Watkins (1993) points out that this contraction only occurs if the coordinator is part of the second clause.

(37) Dáu ā́u. ‖ **gìgáu** èm hṓài
dɔ́– ɔ̃ː gigɔ ẽm– hóːʷ+ajː
[any:3s:1p] give.PF *full stop* **and.SS+then** [2s] travel+start off.PF
'You gave it to us. And then you left' (f.n.)

(38) a. A: Cútà̄dàu dáut ā́́u.
kúʔ+ãː-dɔ dɔ́ʔ– ɔ̃́ː
write+stick-INV [any:3i:1p]= give.PF

b. B: **Gàu** ḗdèàl é ā́́u.
gɔ ẽ́ːʲ-de=al ẽ́– ɔ̃́ː
and.SS this-BAS=also [3s:3s:1s]= give.PF
A: 'He$_4$ gave us a pencil .'
B: 'And he$_4$ gave me this.' (f.n.)

Further evidence that switch-reference is not attached to verbs comes from cliticization. We saw earlier that an SR-marked connective can attach to a right-

dislocated noun. Here is another example (39), which shows that switch-reference in Kiowa is clearly associated with clause-level morphemes, not verbs.

(39) John Bill áu ą́u cútą̀dàuè̲, è têm.

J. B. ɔ́= ʔɔ́ː kúʔ+aː-dɔː=ʔẽː ʔe= tʰêːm

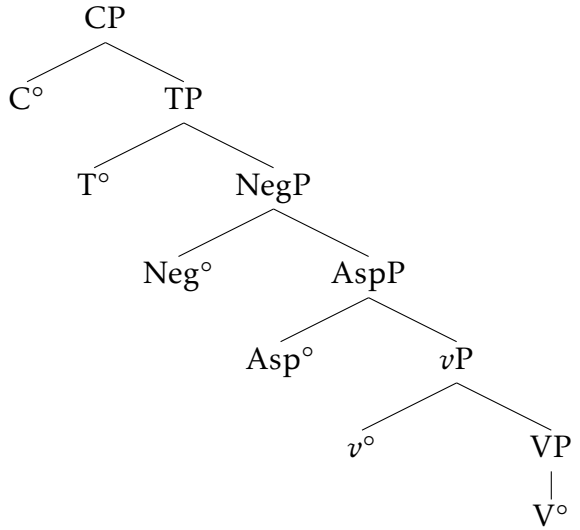
John Bill [3s:3i:3s] give.PF write+stick-INV=**when.DS**, [3s:3i] break.PF

'When John$_1$ gave it to Bill$_2$, the pencil, he$_2$ broke it.' (f.n.)

2.2.1.3 SR is in the extended verbal projection

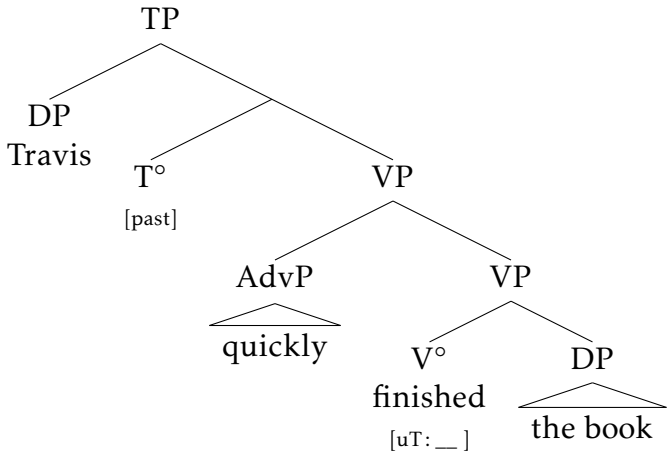
SR morphemes are not verbal in a descriptive sense, but they can be considered to be verbal in a broad structural sense; that is, they are part of the extended verbal projection. If SR is on the extended verbal projection, we predict that it should appear on the verb in many languages, and away from it in others. Verbal morphology (tense, aspect, mood, etc.) is introduced by a series of functional heads that extend from the verb phrase in a universally fixed order, whenever they are present. The functional projections extend beyond the inflectional heads into the complementizers as well. The exact number and nature of heads is disputed, but (40) reflects a standard structure.

(40)



The morphemes introduced by these functional heads are found attached to the verb in many languages. The theory has three mechanisms for this. One is agreement; syntactic features on the verb seek out a tense or an aspect feature, and adopt it. This mechanism is found in many languages, including English; tense morphology appears on a verb that merges at V° and stays there. In (41), the past tense feature on T° agrees with the unvalued tense feature on the verb, providing it with a value. The tense affix is interpreted at T°, but appears on the verb at V°. This process is shown in the abridged tree.

(41) Travis quickly finished the book.



The second mechanism is head movement, where the V° head raises up the chain, picking up the other morphemes as it goes; they all appear on the verb. This process is found in many languages, including French; its discovery by Emonds (1978) and its development by Pollock (1989) were both major milestones in our understanding of syntactic processes. In (42), the verb (*mange*) merges at V°, but the feature valuation process triggers its movement to T°. It leaves behind a copy, which is deleted at PF, thus remains unspoken.

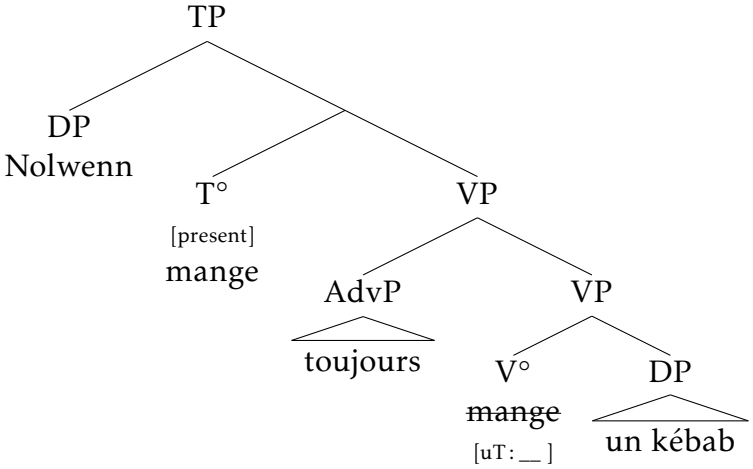
[4]I use 'ModP' to stand in for mood or modality marking.

(42) Nolwenn mange toujours un kébab.

nɔlwɛn mɑ̃ʒ-∅ tuʒuʁ ɛ̃ kebab

N. eat-PRES.3s always a.MASC döner kebab

'Nolwenn always eats a döner kebab' (French)

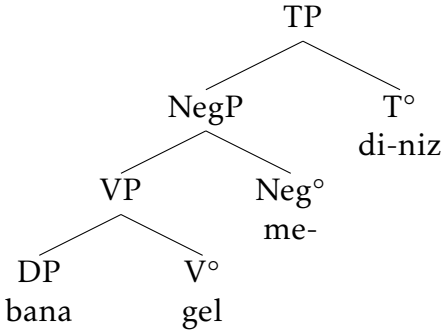


The third mechanism is cliticization, where the heads stay in their respective positions, do not enter agreement relations, but are spoken together phonologically. This option is only available when the heads are linearly adjacent. In head-final languages, like Turkish (43), the heads are lined up, and cliticization can occur (Kornfilt 1997).[5]

(43) bana gör-me-di-niz

me see-NEG-PAST-2P

'you guys didn't see m' (Turkish)



[5]Two things: First, since the heads are adjacent, it actually isn't clear that this isn't just head movement, at least to some extent (Kelepir 2001), and second, I assume right-headedness.

Between these mechanisms, especially the latter two, we can conclude that the apparently verbal nature of switch-reference is nothing more than an illusory artifact of phrase structure. Every language verified to have switch-reference has a verb-final basic word order[6], so either of the two latter mechanisms ought to work.

If SR is on the extended verbal projection, we can predict the different types of SR morpheme exponence. The most straightforward are those where the SR morphemes are easily distinguished. This is the case in languages like Chickasaw (Muskogean, Mississippi/Oklahoma), where the SS marker *-t* is independent of tense, aspect, mood, agreement, and complementizer. This could arise either by head movement or cliticization.

(44) aya-l-a'chi-ka-**t** ithaana-li
go-1s-IRR-Comp-SS know-1s
I know I'm going' (Munro 1983)

We should also see SR forming portmanteaux with another morpheme. Typically this other morpheme is the connective, as in Kiowa, or a marker of mood or tense, as in Mandan (Siouan, North Dakota) where the SR morpheme is fused with the realis and irrealis (Mixco 1997).

Table 2.1. Mandan switch-reference suffixes

	realis	**irrealis**
SS	-rį	-rį
DS	-ak	-ki

In addition, if SR is on the extended verbal projection, we ought to see conditioning effects. The fusion of verbal functional heads creates morphological conditioning environments, where the morphology of one head is determined in part by

[6]The Vanuatu language Lenakel is the only proposed counter-example (Lynch 1983); in fact, this phenomenon in Lenakel and related languages (known as the 'echo subject' construction) is not switch-reference, but a kind of VP-coordination.

the value of another. For instance, in many languages, the aspect morphology depends on the tense; in such a case we can say that the tense marking conditions the aspect marking. If SR is introduced by a verbal functional projection, we should see conditioning effects in some languages, and we do. In some clause-chaining languages, tense or agreement marking varies by value of switch-reference. In Amele, for instance, Roberts (1988) shows that subject agreement morphemes vary depending on the value of SR present. The 1st person singular agreement forms in (45) and (46) change, depending on the SR marker they are next to.

(45) Ija hu-**m**-ig sab j-ig-a
I come-SS-1s food eat-1s-TODP
'I came and ate the food.'

(46) Ija ho-**co**-min sab ja-g-a
I come-DS-1s food eat-2s-TODP
'I came and you ate the food.' (Roberts 1988, (3-4))

The conditioning goes one step further in Apalɨ (Emuan family, Papua New Guinea). Wade (1997) reports that SS and DS do not appear as independent morphemes. Instead, they condition the subject agreement and the dependent tense. For instance, with DS, the simultaneous tense is *-da*, and the 1st person singular agreement is -liŋ (in final clauses, 1s is marked *-n*.) However, with SS, no agreement appears, and the simultaneous tense is expressed by verb reduplication.

(47) vi-da-liŋ iamɨgali lɨgu-av-i
get-SIM-1s.DS woman wash-3p-3
'I was getting it while the women washed it.'

(48) ha-meN **aba** **aba** mig-u-i.
MD-like speak speak move down-go-3
'She spoke like that (SS) while she went down.' (Wade 1997)

Finally, in some languages, the SS and DS forms of the conjunction do not resemble each other at all. This is the case in Maxakalí (Jê, Brazil). This exponence type may have come about in different ways; it is impossible to tell. Perhaps the fusion with the connective is so complete that no deconstruction is possible. Perhaps the conjunction is asyndetic (i.e., lacking an overt conjunction), and the SR morpheme is free standing.

(49) a. ʔɨ̃-mõŋ tɨ ʔ-nĩn
3-go and.SS 3-come
'He went and returned.'

b. ʔɨ̃-mõŋ ha ʔ-nĩn
3-go and.DS 3-come
'He$_1$ went and he$_2$ returned.' (Rodrigues 1999)

2.2.1.4 SR is introduced by a specific head

It is clear that the SR morpheme is in on its own head in the extended verbal projection. This conclusion should not be controversial, but so far, no one has made an argument for it. My argument in favor of this conclusion has four points. The first and strongest is that in many languages, SR is an easily distinguished, independent morpheme. It is clearly not attached to T° in many languages, as we saw above. In some, even, it does not even appear attached to connectives (at C°). For instance, in Mojave, the SR marker is not attached to the connective *nya-* (50). The fact that both are attached to the final verb is predicted if SR is in the extended verbal projection.

(50) **nya**-avač+ku:ʔe:-**kum**, ah^{w}er-k
when-arrive.PL+poor.PL-DS fence in-SS
'When the [poor] parents had a chance to come in, they [the Whites] had fenced the place off' (Mojave, Powskey et al. (1980))

Another reason is that SR's fusion with T° and/or C° in any given language is derived from its being on the extended verbal projection. The fusion is no more an argument against an SR head than the fusion of tense and aspect are arguments against T° and Asp° heads.

A third reason to posit an SR head is conceptual economy. SR morphology has to be introduced by some head. Under a strong cartographic approach (Cinque 1999), the idea that SR is introduced by an SR-devoted head is axiomatic. But even under a more standard approach, we can safely assume as a null hypothesis that every non-ϕ functional morpheme is introduced by its own head. We've seen no evidence against that hypothesis, so it stands to reason that SR morphology is introduced by its own head.

Finally, there are unwelcome consequences to associating SR with other functional heads. If SR is on T°, it would be too tightly tied to the subject. As we will see in the next chapter, SR does not always track subjects. If SR is on C°, it would be too high for the pivot to be a semantic argument of SR. Other than those positions, then, all that remains of the extended verbal projection are left-periphery heads like Top° and Foc°. Neither (overt) topic nor focus phenomena interact with switch-reference. So there must be a head devoted to SR.

In short, SR morphemes are introduced by their own head, somewhere high in the verbal projection. In chapter 4, I present a theory that localizes this head. From this location, SR morpheme can interact with other functional heads, and this interaction derives the facts described in this section.

2.2.1.5 On the origin of switch-reference morphemes

A curious fact about switch-reference morphology in many languages is that the SS and DS markers are homophonous with an opposing pair of morphemes found elsewhere in the language. If we were only looking at one language (or

family) where this occurs, we might conclude that the homophony is no accident, that there is a direct link between the meaning of switch-reference and whatever the homophones mark, which in turn would cast doubt on the conclusion that SR is introduced by its own functional head.

A cross-linguistic examination casts strong doubts on any such link. There is no means of predicting which morphemes the SR markers will be homophonous with. Predicting a link to homophones can have unwelcome consequences. In addition, in many languages, the homophones are not in direct opposition with each other. In others, the SR markers are homophonous with a multitude of morphemes, and there is no way to tell which one is the one with a link. Finally, in most languages, the SS and DS markers are not homophonous with anything. I conclude that any homophony between SR and some other morpheme pair is accidental.

To demonstrate this conclusion, I will discuss one well-studied example of homophony in SR, that of case-markers. Homophony with case is perhaps most striking feature of the SR morphology in the Muskogean family of languages, whose speakers' homelands are in the Southeastern United States. Throughout the group, SS-marking is reliably marked on complementizers with a form identical to nominative case (usually *–(a)t*), while DS is reliably marked with a morpheme identical to accusative case ($-\tilde{V}$).[7] The following Choctaw examples demonstrate this. In (51), the subject and object (which has been left-dislocated) are clearly marked. In (52), the SR markers are identical, except for phonological vowel deletion.

(51) John-a Pam-at písa-tok
J.-ACC Pam-NOM see-PT
'Pam saw John' (Broadwell 2006: 74)

[7] In Choctaw orthography, nasalization is written as an underscore. See Martin (1998) for Creek, Kimball (1991) for Koasati, Broadwell (1997) for Choctaw, Munro (1983) for Chickasaw. In Choctaw and Chickasaw, some clause-chains can have a different SR pair, fused with the connective (*-cha* and *-na*); these have no homophony with any other morpheme pair.

(52) a. Alla'a nakni' móyyoma-ka-**t** oklah aa-ittanáaha-' itt-afaama-tok
child male all[8]-Comp-SS PLUR LOC-meet-NML RECIP-meetPT
'All the boys met at church.' (Broadwell 2006: 226)

b. Shókha' m̲oma-k**a̲** abi-tok
hog all-Comp:DS kill-PT
'He killed all the hogs'

Given this striking identity, a link between case and switch-reference seems intriguing and intuitively plausible. All the more so since it's the nominative that marks subject identity. Rising (1992) even makes a bold claim that the homophony goes the other way: (structural) case is a marker of continuity or disjointness. Let's set aside the particulars of that claim, which would require us to ignore observations about structural case in nearly every other language. Instead, let's focus on the notion that case and switch-reference are linked.

Proposing a strong link between case and switch-reference makes two major predictions that fail. If the distribution of case and switch-reference are tightly linked, languages that don't mark case shouldn't have SR morphology. Kiowa is a very salient counterexample, and it is far from alone. Most SR markers are not homophonous with case markers. Some of these are listed in Table 2.2 on page 73, and many others are listed in the typologies of Jacobsen (1983) and Roberts (1997). The second prediction is that any language with case should use it for switch-reference. That is also not the case. Clearly, there is no cross-linguistic link between case and SR.

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[8]Quantification in Choctaw is expressed on verbs (Broadwell 2006). They take aspectual grades, bear agreement, and are subordinated by complementizers or participial morphemes.

(1) Hash-m̲oma-ka-t hash-iya-k mak-aachi̲-h
2p-all-Comp-SS 2p-go-TNS be-IRR-TNS
'You all must go'

One might reply that these predictions are not necessary, that case and switch-reference might be linked or identical, but exogenous factors prevent the exponence of one or the other. For instance, perhaps Kiowa actually does have case, but exogenous factors like historical change prevent its exponence. Also, one might say that languages that mark case, like German, also have switch-reference, but for some reason it does not get expressed. Such an attempt would be rather weak on its own. But a better reply is that there is a weak link between case and switch-reference. However, if we look at languages where case and switch-reference are homophonous, we see that there can be no link between the two phenomena. Looking back at the Muskogean languages, once we take the absence of a link into consideration, it becomes more plausible to suppose that switch-reference was present in Proto-Muskogean, whence it spread to the daughter languages, instead of suggesting a cross-linguistic link between switch-reference and case.

Two facts demonstrate that there is no link between the particular cases used in Muskogean and SR marking. One is that switch-reference makes the 'wrong' case appear. In Chickasaw, for instance, relative clauses are marked for SR, and not for case. In (53), the relative clause, a subject of the matrix clause, should be marked with nominative case (*–at*, which is identical to SS marking), since the matrix verb *illi*, 'die', selects for nominative-marked subjects. However, it bears DS marking, identical to the accusative. The lack of any nominative case marking in the sentence shows that case and SR can be in complementary distribution. Thus, they cannot be intrinsically linked.

(53) ihoo-at ofi' yamma pi̲s-to-**ka̲** illi-tok
woman-NOM dog that see-PAST-Comp:DS die-PAST
'The dog the woman saw died' (Munro 1983: 230)

In Choctaw, relative clauses are marked by complementizers bearing switch-reference *or* a case-marked determiner. In (54), the relative clause has a comple-

mentizer and SS marking, which is identical to the nominative case marking, despite being the object, and despite there being a nominative-marked subject.[9] The SS marking indicates that the subject of the relative clause and that of the matrix clause co-refer.

(54) Kátomma-h John-at [ofi' aa-pí̲sa-to-ka-**t**][10] cho̲pa-tok?
where-TNS John-NOM dog LOC-see-PAST-Comp-SS buy-PAST
'Where did John$_1$ buy the dog he$_1$ saw? (Broadwell 2006)

The second reason to believe there is no link between any particular case and SR is that other languages with SR markers homophonous with case markers use different cases for the same value of SR, or use the same case for different values of SR. For instance, Austin (1981) finds that many Australian SR markers are homphonous with case markers. In many languages (including Gugada, Pitjantjatjara, and Arabana-Wangganguru), the realis DS marker is homophonous to the locative case. However, in many others (like Alyawana, Wagaya, and Garawa-Wanyi), it's the realis SS marker that's homophonous to the locative. In some (but not all) of the languages where this latter situation holds, the allative marks DS. Given evidence like this, it seems that there is no link between any particular case and any particular value of SR.

Another difficulty of relying on homophony is that the case markers might not be the only homophonous pair. In Jamul Tipaay (Miller 2001), for instance, the SS marker *-k* is homophonous with no fewer than *thirteen* other morphemes, and the DS marker *-m* is homophonous with no fewer than *twelve*. Some of these are case markers (e.g., cislocative and translocative), but others are tense/aspect markers, or relativizers.

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[9] Choctaw wh-words are verbs, like the quantifiers are.

[10] Broadwell glosses this example a little differently; I've made minor irrelevant changes for clarity.

In addition to the empirical concerns with a strong link between case and switch-reference, there is a theoretical problem as well. Assigning case to switch-reference markers would be problematic whenever a sentence had both a transitive verb and a DS-marked subordinate clause, for the direct object and the clause would both take accusative case. The same problem occurs for SS-marking and nominative case— any subject would also be nominative-marked. For SR-marking to involve case, we must assume that any structural case can be generated independent of any assigning functional heads.[11] Given all this evidence, we can conclude that there is no meaningful link between case and switch-reference.

If case and switch-reference have no overt link, what is going on in these languages? It seems quite clear that the homophony is not a sign of homosemy. So why is there homophony at all? I propose that what is happening is the **exaptation** of morphemes from one system to the switch-reference system. Exaptation is a biological term that describes the change in function of a trait over time. A well-known example is bird feathers, which evolved as a heat-regulation system, but later became used for flight, without significantly changing form. Exaptation is also common in cognition. In fact, Mercier & Sperber (2011) argue that reasoning itself is an exaptation of a cognitive system meant merely to win arguments sophistically to gain social dominance.

I use the term *exaptation* to describe the co-opting of morphemes from one module of grammar to another, without changing phonetic form, in order to serve a different function. This change in function is derived from a change in semantics, for the semantics of a functional item essentially describes its function. For the Muskogean languages, the exaptation would have taken place as follows:

---

[11] Broadwell (2006) mentions another Choctaw fact that casts doubt on a link between case and SR. Accusative case-marking in Choctaw is not obligatory on objects. It depends on a lot of discourse factors, and Broadwell notes that up to 90 percent of objects in texts are not marked (p. 73). By contrast, switch-reference's appearance in Choctaw does not depend on discourse factors at all.

As switch-reference arose in Proto-Muskogean, the morphemes *-t* and *-$\tilde{V}$* were exapted from the case system to the emergent switch-reference system.[12]

We might ask, though, why does exaptation occur at all? Why doesn't each language create its own SR morphemes? The answer to those questions lies in the way SR emerges. Exaptation obviously did not occur in every SR language; switch-reference had to arise somewhere. However, switch-reference is well-observed to spread by language contact in addition to language divergence (Oswalt 1976; Austin 1981; Roberts 1997). This means of spreading is called areal diffusion. Areal diffusion of a grammatical item is signaled most clearly by geographic contiguity and lack of genetic relation between the languages that have that item. Recall that some Australian languages use a DS marker that is homophonous with the locative case marker, while others use an SS marker homophonous with locative case. Austin (1981) mapped them and made a striking discovery: The languages where locative marks DS are to the southwest, while those where it marks SS are to the northeast, and a solid line can be drawn between the two groups. Not only that, the languages in each of the two groups are not genetically related, and each uses their own language's marker for the locative for SR. This suggests a combination of areal diffusion and exaptation.

Areal diffusion is also suggested by the distribution of switch-reference languages in North America, as the map on page 54 indicates. The only outliers are the Muskogean group and the Tonkawa of modern-day southeast Texas, but most of the tribes that lived between the Muskogeans and the other switch-reference language speaking tribes died out or dispersed into other tribes before anyone could record their languages. Perhaps these, too, employed switch-reference, and the proto-Muskogean speakers borrowed it from them.

[12]The suggestion I make here does not rule out the possibility that the exaptation went in the other direction.

Areal diffusion, coupled with exaptation, is the source of many SR morphemes around the world.[13] However, it does not explain the independent appearance of switch-reference systems on the different continents. New Guinea and Australia are close enough to allow for diffusion from one to the other, but there is no such link to the Americas, or to Africa or the Subcontinent. It is likely, then, that switch-reference arose more than once in the history of language, and that suggests that a theory of switch-reference should form part of a theory of universal grammar.

When areal diffusion and exaptation work in tandem, we get homophony. The process would work like this: A language's speakers adopt switch-reference from a neighboring language. They borrow the phenomenon but not the morphology. Instead, they employ their own markers, exapting some pair that shows an opposition. This leads to some languages using case markers, others using tense markers, and so on. Table 2.2 lists a few examples of homophonous SR marking.

language/family	*location*	*SS marker*	*DS marker*
Creek	N.Amer.	nominative (-t)	accusative (-$\tilde{v}$)
Mpwarnte Arrente	Australia	ergative	nominative
Mojave	N. Amer	k-class tense (-k)	m-class tense (-m)
Crow	N. Amer	subject relative (-ak)	indef. object rel. (-m)

Table 2.2. Examples of exaptation of switch-reference morphemes

Switch-reference is not the only phenomenon where areal diffusion and exaptation work together. The Yiddish language allows non-argument expletive demonstratives in the Initial Field (Prince 1998). In (55), the demonstrative before the verb is neuter, while the arguments are masculine and feminine. The resulting

[13] Jacobsen (1983) makes a suggestion in this direction.

meaning is something like a cleft in English, though the Yiddish structure is not a cleft.

(55) **Dos** hot Leyb gezen Erike-n.
this:NEUT has Leonard:MASC.NOM seen Erica-FEM.ACC
'It's Leonard who saw Erica.'

Yiddish is a Germanic language, yet no other Germanic language allows this. However, there is a structure in Russian identical to the Yiddish, minus the verb-second effect.

(56) **Eto** L'eon'id uv'id'el Er'iku.
this:NEUT Leonard:MASC.NOM saw Erica:FEM.ACC
'It's Leonard who saw Erica.'

Prince argues that Yiddish speakers borrowed this usage from Russian,and mentions several facts that are consistent with areal diffusion. This phenomenon is missing from genetically related languages. It is found in no other extant Germanic language, and is even missing from Old Yiddish. The presence of this phenomenon is also geographically determined. As Prince points out, Old Yiddish was only spoken in Germanic-speaking areas before migration into Slavic-speaking areas. In addition, this use of the neuter demonstrative only appears in the eastern dialects of Yiddish, spoken in Slavic-speaking areas. It never appeared in Western Yiddish, which comprises the dialects spoken in Germanic-speaking areas of Western Europe.

The areal diffusion of this phenomenon is clear, but the exaptative process is a little more subtle than it is with switch-reference in Muskogean. Yiddish speakers did not borrow the Russian demonstrative itself. We might conclude that this was due to Yiddish having the neuter demonstrative. However, if we consider the semantics involved, we see that it actually didn't. The neuter expletive and the

meaningful deictic demonstrative are homophones, but are not synonymous, since the expletive lacks deixis.[14] Thus, they are two separate lexical items. Before areal diffusion, Yiddish only had the meaningful neuter demonstrative. To serve as an expletive, we could imagine several options that could have been chosen: Borrowing the Russian *eto*, creating a new expletive, or using an already extant expletive, like *es*. Instead, Yiddish-speakers exapted the Yiddish neuter demonstrative from its deictic meaning. The homophony is a result of exaptation, but does not signal synonymy.

To summarize this discussion: I argue that there is no clear link between the semantics of an SR morpheme and a morpheme it is homophonous with. Any apparent link is the result of exaptation in the development of switch-reference. SR morphemes have a variety of etymological sources, but the only thing they have in common is their use in switch-reference. These facts strongly suggest that the meaning of switch-reference is independent from any morpheme it is found with in a given language.

Note that I am not proposing that *every* language acquires switch-reference this way. Some SR languages use morphemes that don't seem to match anything else in the language. The origin of these is unknown, and perhaps unknowable. It may be a case of exaptation where the original morpheme has changed since, or dropped out of use. It may be that the language speakers came up with a new morpheme. Or, it may be that the switch-reference arose natively, without being borrowed.

2.2.1.6 Kiowa switch-reference morphemes

Kiowa is not very instructive on the matters of exponence or exaptation, but I will discuss its switch-reference morphology because of its importance in this

[14]It may be the case that the expletive does not even have an index to point to a referent via an assignment function.

dissertation. Watkins (1993) gives the first detailed description of Kiowa SR morphemes, adding to the discussion in Watkins (1984). The SR markers form portmanteaux with various conjunctions and postpositions, as shown in Table 2.3. It appears with these and no others. Because of the fusion of SR with the connectives, it seems futile to attempt to deconstruct these portmanteaux to find an independent SS or DS form in Kiowa.

Table 2.3. Kiowa switch-reference markers (Watkins 1993)

Sentence-initial connectives		**Sentence-final connectives**	
Kiowa	English gloss	Kiowa	English gloss
gàu/nàu	'and'	=gàu/=nàu	'if, as, etc.'
qàut/àut	'and+EXPRESSIVE[15]	=qàut/=àut	'and, if, as, etc.+ EXPRESSIVE
		=ch$\underline{\grave{e}}$/ =$\underline{\grave{e}}$	'when'

Exaptation may have occurred in the development of the Kiowa SR markers. It is possible, perhaps probable, that the DS postposition meaning 'when' ($\underline{\grave{e}}$) is exapted from the postposition $\underline{\grave{e}}$, meaning 'at' (See chapter 4 for the role of 'at' in the meaning of *when*-clauses). However, there is no morpheme *ch*$\underline{\grave{e}}$ in the language that might have served as a source for an exapted SS marker.

Based on the lack of a homophone for *ch*$\underline{\grave{e}}$, we might suppose that SR is not fused with the postposition, but rather an independent morpheme that is phonologically attached to the postposition. That is, SS is marked (by *ch–* (/ts/)), while DS is simply null, or the absence of any SR-marking at all.

This proposal is tempting, but it is too narrow. If we look at the other Kiowa connectives where SR appears, it falls apart, for several reasons. The first is that if the SS marker is /ts/, there is no phonological mechanism that could account for the other adverbial forms being [g] and [kʔ]. The second, admittedly weaker due

[15]Watkins (1993) reports that "the pair *qàut/aut* expresses the speaker's assessment of the event in the [anti-pivot] clause as either disfavored or unexpected. (p. 139)" I thus gloss it as EXPRESSIVE, after Potts (2005).

to lexical selection, is that if the SS morpheme were independent from these three postpositions, its absence with all other sentential postpositions is unexplained. The third is that if SR is sentence-final with *=ch̲è/ê̲*, its sentence-initial appearance at the beginning of a conjoined clause with *gàu/nàu* or *qàut/àut* is unexplained. It makes more sense if *=è̲* is a portmanteau.

Similar reasoning applies to coordinating conjunctions. If either *gàu* (SS) or *nàu* (DS) is a bare conjunction, it should be *gàu*, the SS-marker. Since non-sentential coordination in Kiowa employs *gàu*, and no other conjunction (65a), this seems plausible, and leads to the observation that only DS is marked on coordination in Kiowa, and only SS is marked on subordination. Unfortunately, this observation does not hold, for three reasons. First, it would suggest the same distribution for the cliticized *=gàu/nàu*, which is subordinating (57). Second, the same reasoning applies to the expressive coordinator *qàut/áut*, and the subordinator *=qàut/áut*, which have the same distribution as *gàu/nàu* and *=gàu/nàu*

(57) À fő̲chân èm kópdàumè**nàu**.
ʔa– pó́ː+tsân [ẽm– kʰóp+dɔː-meː=nɔ]
[1s] see+arrive.PF [2s] hurt+be-EVID-*and*.DS
'I came to see you because (I heard) you were sick.' (Watkins 1993, (5c))

Finally, as the next chapter will make clear, SS and DS marking in Kiowa always mean something— there is no SR morphology without some SR meaning. Since the semantics is always there, we can conclude that the 'bare' forms in Kiowa that seem to be merely exapted are actually fused with SS or DS morphemes that trigger no apparent change in form. The origins of the SR morphemes in Kiowa are murky.

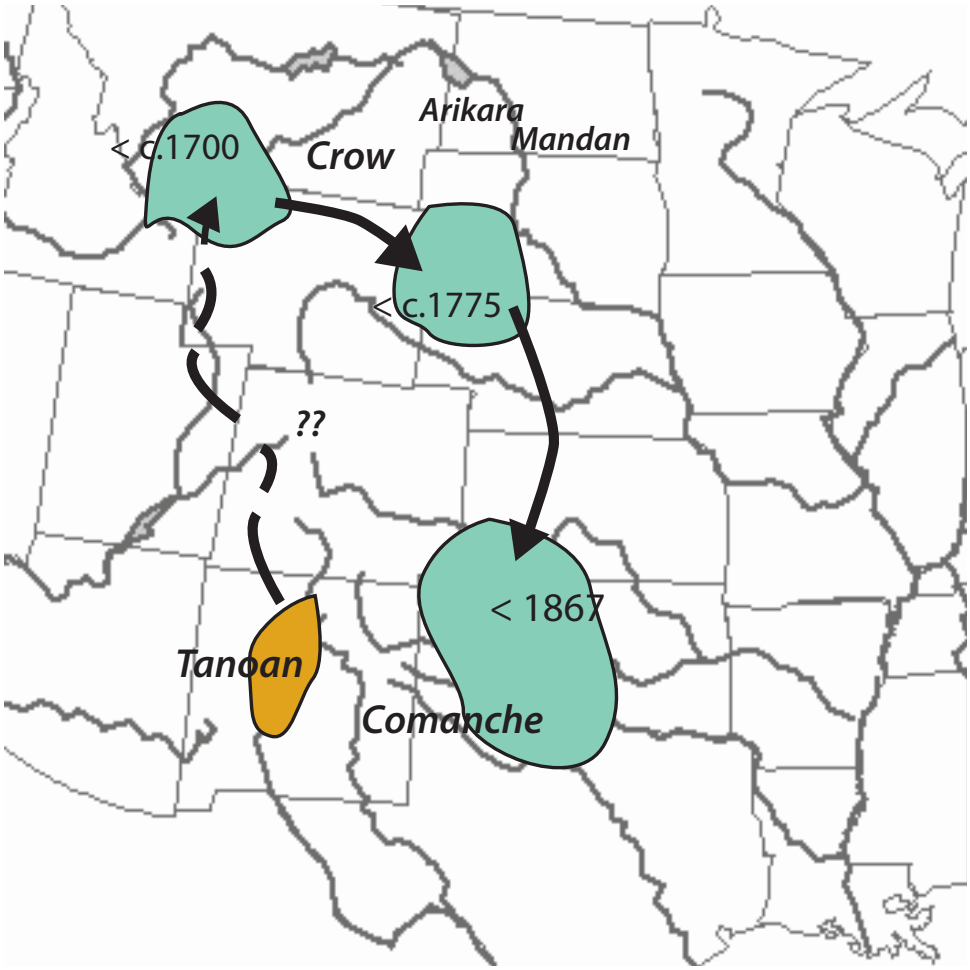
Possible origins of Kiowa SR morphemes While exaptation may or may not have played a role in the development of SR morphology in Kiowa, it does seem more certain that areal diffusion did. Kiowa is in a family with the Tanoan lan-

guages, spoken in the Rio Grande Valley (See Figure 2.2). Yet, no Kiowa-Tanoan language besides Kiowa has switch-reference (Trager 1946; Leap 1970; Zaharlick 1977). This kind of distribution is a solid sign of areal diffusion (section 2.2). Areal diffusion is also suggested by what we know about Kiowa history. The Tanoan tribes' homelands are in modern-day New Mexico. Since the Kiowa language is of the same family, we can safely presume that the Kiowas once formed part of that Pueblo society. They migrated away from the Rio Grande Valley sometime before any oral or calendar histories record (i.e., many hundreds of years ago). The first written account of Kiowa history is Mooney (1896)'s famous book *Calendar History of the Kiowa Indians*, and he records stories that reach as far back as around 1700. However, nothing in Kiowa culture suggested a relationship to the Pueblo peoples, and the Kiowas of that time denied any. Yet, the linguistic evidence is undeniable.

The migratory history of the Kiowas may provide us with a way to understand why it alone among the Tanoan language developed switch-reference. This development stems from the fact that they are the only Tanoan people to leave the Rio Grande Valley. Over the course of a few hundred years, they wound up tracing an arc down to their final pre-reservation range, in the Western Plains (Figure 2.2). By the time their language began to be recorded, they had long been in close contact with speakers of several switch-reference languages, notably the Crow and the Comanche, with whom the Kiowas had formed strong and lasting alliances. In addition, these two tribes were more dominant in their respective regions, and far more populous.[16] It has long been observed that language borrowing tends to proceed from more dominant and prestigious cultures to those that are less so, as the Yiddish case discussed also exemplifies. While nothing can be proven beyond a

[16]For example, the Comanche may have numbered some 20,000 strong in the early 19th century, and were richer and more powerful, having been the first Plains tribe to master the horse culture (Hämäläinen 2003), while the Kiowas never grew beyond 2,500 before the mid-20th century (P. McKenzie, ms.) and only number some 12,000 today.

Figure 2.2. Known migrations of the Kiowa, ca. 1700-1867, with the names of tribes in close contact with Kiowa whose languages have switch-reference



doubt, I find it plausible to speculate that Kiowa borrowed switch-reference from one or more of its neighbors.

2.2.2 Types of clause juncture where switch-reference is found

While SR is always found at a clause juncture, it has almost no other cross-linguistic restrictions. It appears in a wide variety of syntactic configurations, and with a range of connectives that support different structures of subordination: complementation, relativization, and adverbial clauses. The only obvious cross-

linguistic lacuna is semantic— switch-reference never appears with disjunction in any language.

Language-particular restrictions seem lexical in nature. Switch-reference is restricted to particular sentential connectives, but there is no way to predict for any given language which clauses will have SR, and which won't. Some languages only mark SR on certain adverbial connectives, while others only allow it on coordinating conjunctions. No language is attested to allow SR with all connectives. These facts lead to the conclusion that switch-reference is not restricted by the syntax of clause juncture, because any theory relying on the syntax will fail to have cross-linguistic import. As a result, any theory of switch-reference will have to rely on the semantics and the lexicon to understand the distribution of SR morphemes.

Recall the notions of pivot and anti-pivot (section 2.1.3), which describe the arguments tracked by switch-reference. Across the various types of clause-juncture, we can see a generalized structure for switch-reference:

(58) $[_{\text{anti-pivot clause}}\ A_{\text{anti-pivot}} \dots [_{\text{pivot clause}}\ \text{SR}\ [\ B_{\text{pivot}} \dots]\ ] \dots]$

2.2.2.1 Subordination

Switch-reference is often found associated with subordinating connectives. It is generally considered in such cases to be a part of the embedded clause, where it tracks the embedded 'subject' and the matrix 'subject'. The pivot clause is the embedded clause, and the anti-pivot clause is the matrix clause. I schematize this general subordinating structure in (59). The embedded subject, being clausemate to the SR morpheme, is the pivot (B). The matrix subject, being non-clausemate to the SR morpheme, is the anti-pivot (A).

(59) $[_{\text{matrix}}\ \boxed{A_{\text{anti-pivot}}} \dots [_{\text{embedded}}\ \text{SR}\ [\ \boxed{B_{\text{pivot}}} \dots]\ ]$

As Finer (1984, 1985) demonstrated, linear order is ignored in favor of structural hierarchy. When two linearly adjacent SR-marked clauses are subordinate to the

same matrix clause, the SR marker on each will refer to the main clause, not to the adjacent subordinate clause. In other words, all pivot clauses subordinate to the same dominant clause also share an anti-pivot clause. This is schematized in (60), where the first SR marker, SR_a, tracks B and A. The second (SR_b) tracks C and A, not C and B.

(60) a. $[_{\text{matrix}}\ \boxed{A_{\text{anti-pivot a,b}}} \ldots [_{\alpha}\ C\ SR_a\ [\ \boxed{B_{\text{pivot a}}} \ldots]\ ]\ [_{\beta}\ CSR_b\ [\ \boxed{C_{\text{pivot b}}} \ldots]\ ]$

b. SR_a tracks B and A

SR_b tracks C and A ; not C and B

In a subordinating configuration, the pivot is always in the embedded clause, no matter whether the embedded clause is spoken first or last *vis-à-vis* the matrix clause, as this example from Diyari (Pama-Nyungan, Australia) shows.

(61) nawu pali-na wara-yi [munta ŋama-**nandu**]
3sg die-PCP AUX-PRES sick sit-SEQ.SS
'He died after being sick.' (Diyari, Austin 1981).

The same fact applies in Kiowa (Watkins 1993):

(62) À fo̲chân [èm kópda̲umè**nàu**]
a- pó̠ːʷ+tsâ̠n ẽm- kʰóp+dɔ̃ː-mẽː=nɔ̃
[1s] see+arrive.PF [2s] sick+be-EVID=ADV.DS
'I came to see you because (I heard) you were sick.' (Watkins 1993, 141)

Center-embedding of an SR-marked clause is also possible; the bound-variable reading demonstrates that the pivot clause is embedded inside the matrix clause.

(63) Háun hájél [èm gúnmáu**chè̲**] èm dáujàugù
hɔ̠́n hátél ẽm– gún-mɔ̃ː=tsẽːʲ ẽm– dɔ́ː+tɔː-guː
NEG person.INDEF [3S.RF] dance-IMPF=**when.SS** [3S.RF] sing+act-NEG
'Nobody sang$_1$ while they$_1$ danced.' (Kiowa, f.n.)

The subordinating configuration is the most commonly studied configuration that switch-reference is found in. Indeed, the Binding Approach (Finer 1984; Broadwell 1997), as discussed in section 2.4, predicts it to be the only one. However, it appears in two other configurations— coordination, and clause-chains.

2.2.2.2 Coordination

Switch-reference appears with coordinating conjunctions in many languages, including Kiowa (Watkins 1993).

(64) a. Yísàum hébà **gàu** èm sáu.
jí:sõm ∅– hé:bà gɔ ʔẽm– sɔ́:
Y. [3s] enter.PF and.SS [3s:RFL] sit down.PF
'Yisaum$_1$ came in and he$_1$ sat down.'

b. Yísàum ∅= hébà **nàu** èm= sáu.
jí:sõm ∅– hé:bà nõ ʔẽm– sɔ́:
Y. [3s] enter.PF and.DS [3s:RFL] sit down.PF
'Yisaum$_1$ came in and he$_{*1/2}$ sat down.'

As coordinators, *gàu* and *nàu* only appear in opposition when linking matrix clauses. For coordinations smaller than that, only *gàu* is allowed.

(65) a. Qá̱hî̱ **gàu** màyí è̱ kàuléchàn
kʔʲǽ:hĩ: gɔ mã:yí: ʔẽ- kʰɔ:lé+tsãn
man and woman [3d] together+arrive.PF
'The man and the woman showed up together.'

b. *Qá̱hî̱ **nàu** màyí è̱ kàuléchàn

Switch-reference is found in coordinating contexts in other languages as well, for instance in the Australian language Pitjantjatjara (66) and the North American language Lakhota (67).

(66) a. **Munu** kunyu ngari-ngi kunkunpa
and.SS EVID lie down-PT.IMPF sleep
'And he (the child) was sleeping.'

b. **Ka** kunyu kuṯa panya mungawinki mulapa paka-n̲u
and.DS EVID older brother ANAPH morning INTENS get up-PT
'And the older brother got up early.' (Bowe 1990: 96)

(67) Joe wĩyã wã hãska čʰa wãyãkĩ **na** heye...
J. woman tall 'a' see and.SS say
'Joe saw a woman who was tall, and he said, ...' (Dahlstrom 1982, 72)

While SR is fairly common with sentence-initial conjunctions, there are no attested cases of SR occurring with other types of coordinating conjunctions. For instance, Haspelmath (2004) describes in his typology of coordinating constructions that many languages employ coordination markers that are cliticized to the second conjunct. Perhaps most well known is the Latin enclitic *-que* (68), which is by and large interchangeable with the intercalary coordinators *et* or *ac/atque* (Devine & Stephens 2006). While such coordinating enclitics are not uncommon across languages, I have found no cases of SR appearing with one.

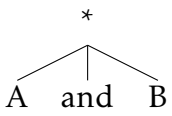
(68) *agricola **et** senator* = *agricola senator**que*** 'a farmer and a senator'

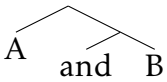
It may also be the case that in some languages, SR occurs with asyndetic clause coordination (the coordinator is not overt). If so, it would look no different from clause conjunction with conjunctions that form portmanteaux with SR. In Kiowa, SR can form a portmanteau with the conjunction, but because it also forms portmanteaux with other connectives, we can rule this possibility out for Kiowa.

The structure of switch-reference with coordinating conjunctions differs from the structure of switch-reference with subordinating connectives. Attached to a matrix clause, SR tracks that clause's pivot against that of the previous matrix

clause. The anti-pivot clause always precedes the pivot clause. This generalized coordinating structure is schematized in (70). I assume that coordinating structures are asymmetric; instead of involving a ternary branching structure with two sister conjuncts, coordination involves an embedding binary branching structure (69).

(69)





In a series of coordinated clauses, schematized in (71), SR_a tracks arguments B and A, while SR_b tracks C and B, never C and A.

(70) $[_{\text{matrix}}\ \boxed{A_{\text{anti-pivot}}}\ \ldots\ ]\ [_{\text{matrix}}$ and SR $[\ \boxed{B_{\text{pivot}}}\ \ldots\ ]\ ]$

(71) a. $[_{\text{matrix}}\ \boxed{A_{\text{anti-pivot a}}}\ \ldots\ ]\ [_{\text{matrix}}$ and $SR_a\ [\ \boxed{B_{\substack{\text{pivot a}\\ \text{anti-pivot b}}}}\ \ldots\ ]]$

$[_{\text{matrix}}$ and $SR_b\ [\ \boxed{C_{\text{pivot b}}}\ \ldots\ ]]$

b. SR_a tracks B and A

SR_b tracks C and B ; not C and A

2.2.2.3 Clause-chaining

Switch-reference is often found in languages with clause-chains. A clause-chain is a series of verb-final sentences in which only the final verb is fully inflected. Non-final verbs, called *medial verbs*, either lack inflection altogether or exhibit fewer inflectional categories than final verbs. When they are inflected, they often exhibit different paradigms from those for final verbs.

Clause-chaining is found throughout the world, but it is extremely common in Papua New Guinea languages, which have often been extensively studied. For instance, in Tauya medial verbs lack tense/mood marking, and have a different agreement paradigm from final verbs. This is evident in the aorist, where the agreement forms on a final verb (72) do not distinguish between first and second

person, but those on a medial verb do (73). Note also the lack of mood marking on the medial verbs.

(72) yate-**e**-ʔa
go-1/2-IND
'I / you(sg.) went' (Tauya, Macdonald (1990))

(73) a. yate-**e**-te
go-1s-DS
'I went and…'

b. yate-**a**-fe
go-2s-DS
'You (sg.) went and…'

Switch-reference has been attested in India in the Munda family of languages (Anderson 2007). These languages, like those in PNG, use switch-reference solely on clause-chaining configurations. The sentence in (74) is an example from Gtaʔ; SS marking and DS marking appear on verbs that lack tense or aspect marking.

(74) karwali li-**ce** cu-**la** goɽæ=o atwaʔ-haʔ
bitter gourd creep-SS bear fruit-DS boy there-EMPH
llæʔ-miaʔ-k[e]ɽak-ke
RED:remain-HAB-T/A-state-T/A
'It is said that the bitter gourd sent out creepers and bore fruit, and the child stayed there (as always) (Gtaʔ, (Anderson 2007: 752))

Chains can be quite long, covering enormous stretches of discourse, as shown by this example from the Crow language (Siouan, Montana/Canada). This passage contains ten chained clauses, two of which contain subordinate clauses, one of which itself contains two chained clauses. In each of these clauses, the subject is

the same, so the SS marker *-(a)k* is used at each chain boundary. Only the final verb is fully inflected for declarative mood and habitual aspect.

(75) bassée "dakáak-duut-uua" huua alachée-t koon awé xakúpp-aa-**(a)k**
formerly bird-get-PL say.PL ridge-DET there earth hole-CAUS-SS
baliiché shóshiw-ii-**ak** áakee-n bikkée dúusaa-**(a)k** iischéáakee-n
willow lay_in_row-CAUS-SS top-LOC grass put_down-SS rabbit top-LOC
dúusaa-**ak** kalakoón hinne xakúpee-sh awúua-l-ii-**ak** [dakáake
put_down-SS then this hole-DET inside+be_at-CAUS-SS bird
shilashoonn-áa-*(a)k* duú-o-t] ihch-íassii-**ak** [hinne iischée-sh
whoosh-PUNCT-SS come-PL-TEMP REFL-watch-SS this rabbit-DET
dútchi-wi-o-t] ichkíiseetii-**ak** awuú-ss-dakaa-**(a)k** áap-uua
get-would-PL-TEMP take_by_ankle-SS inside-GOAL-pull-SS their_neck-PL
dúuwiil-**ak** kalakoon dútchi-i-lu-k
twist-SS then get-HAB-PL-DECL
'in the old days when they would catch eagles, they would dig a hole on a ridge, lay willows over it, put grass on top, and lay a rabbit on top; then they would get into this hole, and when the eagles came flapping their wings, they would watch carefully, and when the eagles tried to get this rabbit, they would grab them by the feet, pull them inside, and twist their necks, and then they would have them.' (Crow; Graczyk 2007: 403)

The syntactic status of clause-chains has been a subject of controversy in the switch-reference literature. Roberts (1988) argues against Finer's (1984) theory of SR by claiming that clause chains are coordinating. Finer's theory relies on the Binding Theory, which relies on c-command. Assuming a ternary structure like he does, coordination would not provide a necessary binding domain. Broadwell (1997, 2006) counters with evidence that clause chains are indeed subordinating, thus saving Finer's binding-based approach. As it turns out, both may be

right, since the behavior of clause-chains may vary from one language to the next (Roberts focuses on Amele, Broadwell on Choctaw). Also, even within a single language, the evidence is conflicting.

Along several criteria, a medial clause is subordinate— modals later on in the chain may take scope over them, they cannot stand on their own, they violate Ross (1967)'s Coordinate Structure Constraint (Broadwell 2006). Also, the temporal morphemes on medial verbs are often relative tense markers indicating simultaneity or sequence, to the event in the next chain. That is, they are not indexically past, present, etc. Indexical tense morphemes only appear on the final verb. However, along other criteria, they are coordinate structures– they do not allow cataphora, they cannot be postposed, they may be independent of later scope-bearing items, their event is considered separate from that of the next clause (Roberts 1988), and they allow across the board movement (Dickey 2000).

Let me discuss just one example to demonstrate the difficulty of categorizing the type of clause juncture used in clause-chaining. In Amele, only the final verb bears tense marking, and all the medial verbs are interpreted as having the same tense as the final verb. This suggests that the final verb dominates the others.

(76) Ija bili-m-ig uqa ho-ho-n f-ig-**a**
I sit-SS-1s he SIM-come-3s.DS eat-1s-TODPT
'I sat and as he came I ate' (Amele, Roberts 1997: 184)

On the other hand, negation can be marked in medial clauses, by the particle *qee* ([ʔeː]), which scopes over every event in the chain thereafter, including the final verb. This suggests that the final verb is dominated by the others.

(77) a. Ho busale-ce-b dana age **qee** qo-l-oin.
pig run out-DS-3s man 3P not hit-NEG.PT-3P
'The pig ran out and the men did not kill it' (Roberts 1988: 52)

b. Ho **qee** busale-ce-b dana age qo-l-oin.
pig not run out-DS-3s man 3P hit-NEG.PT-3P
'The pig did not run out and the men did not kill it'

Outside the switch-reference literature, Foley & Van Valin, Jr. (1984) proposed that clause-chains are a third type of sentential connective that they call *co-subordination*, which encompasses clauses that are syntactically subordinate but semantically independent. Stirling (1993) suggests that clause-chains can be either coordinating or subordinating, depending on their semantics. Suffice it to say that there is little consensus on the nature of clause-chains, and little hope of arriving at one without detailed cross-linguistic investigation.

The controversy on clause-chains is intriguing, since so many languages show SR on them, but ultimately, I bring up the phenomenon only to set it aside for the rest of this dissertation. I have three reasons for doing so. First, the lack of any solid understanding of the syntax and semantics of clause-chains entails that any theory of switch-reference that focuses on them will require excessive amounts of speculation. Second, the language this dissertation focuses on the Kiowa language, and Kiowa lacks clause-chains.

The third reason is that the question of syntactic configuration may be moot as far as switch-reference goes, because recent research indicates that coordination is a type of subordination. The first to propose this was Munn (1993), who proposed a structure wherein second conjuncts are complements to a coordination phrase that adjoins to the first conjunct. Johannessen (1998) proposes instead that the first conjunct is the specifier of the coordination phrase. In chapter 4, I will adopt Munn's proposal for this dissertation, but if either of these is correct, then any remaining syntactic differences should not be very consequential for switch-reference. Indeed, I suspect that only detailed semantic fieldwork will be able to tell us about the true nature of clause-chains.

It is well beyond the scope of this study to fully understand the structure of clause-chains. It seems best, therefore, to treat them on their own terms. Let us keep on target and focus on the relation of clause chains to switch-reference. On that count, the evidence is unequivocal. With respect to switch-reference, clause-chains behave like coordinated structures in that switch-reference applies linearly. However, clause-chains are unlike coordination in that one clause chain is the pivot clause of the next. In (78), SR_a tracks A and B, while SR_b tracks B and C.

(78) [[[$\boxed{A_{\text{pivot a}}}$ ...]$_{\text{medial}}$ SR_a] [$\boxed{B_{\substack{[\,[\,[\,\text{anti-pivot a}\\ \text{pivot b}}}}$ ...]$_{\text{medial}}$ SR_b] [$_{\text{final}}$ $\boxed{C_{\text{anti-pivot b}}}$ ...]
]]]

(79) SR_a tracks A and B ; not A and C
SR_b tracks B and C

The difference between clause-chains and coordination may be derivable from an independent difference between the two clause types. Coordinated phrases are second conjuncts. If we assume an adjunction analysis, they are strictly forced to right-adjoin and thus follow the first conjunct. Clause-chains are strictly forced to left-adjoin, and precede the next chain clause. In both cases, the adjoining clause is the pivot clause.

By now, it should be clear that the configuration question is not very informative about the limits of switch-reference. Any theory of switch-reference will have to be compatible with all three types of configuration. Therefore, focusing on their syntactic differences is unfruitful, especially since there is no consensus on the structures of some of these configurations. This suggests that any relevant difference between clause types is semantic, so exploring their semantics is the right approach.

2.2.3 Conclusions drawn from morphosyntactic facts

This section has demonstrated that attempts at describing switch-reference based on the form of the morphemes or the structure of the clause junctures will fail to deliver any positive cross-linguistic generalizations. What can be concluded, however is the following:

1. SR morphology in a language often (but not always) consists of a pair of complementarily distributed morphemes, labeled SS and DS.

2. SR often spreads through areal diffusion.

3. SR morphemes are often exapted from some other morpheme pair in the language that exhibits a complementary distribution.

4. The exapted forms do not have any semantic link to the semantics or usage of switch-reference.

These are not conclusions a theory must necessarily account for, since they are not predictable, but facts that a theory must be compatible with. These facts can rule out a theory, and are useful in that regard. However, if we are to understand the workings of switch-reference, we need generalizations that allow us to propose a theory. To that effect, this section has shown some interesting facts which can be generalized about the syntactic distribution of SR morphemes:

(80) Distribution facts of SR morphemes

    1. SR morphemes are introduced by a specific functional head in the extended verbal projection

    2. SR morphemes only appear at clause junctures

    3. SR morphemes appear at all types of clause junctures

    4. SR morphemes appear at the edge of their clause

5. SR morphemes only appear once per clause

These generalizations are informative, and suggest that switch-reference is a sentential phenomenon, rather than a nominal one. Still, they will not suffice as the basis of a complete theory of switch-reference.

2.3 Components of a theory of switch-reference

What must a theory of switch-reference account for? It must account for the distributional facts in (80), the generalized structure of switch-reference in (58), as well as a way to predict whether SS or DS marking appears. These components can be organized into four desiderata of a theory of switch-reference, each of which is addressed by several more precise questions.

1. *the SR morpheme:* What kind of object is the SR morpheme? What syntactic category is it in? What is its semantics? How do these predict its distribution? This question has already been addressed to some extent, though not completely.

2. *pivot selection:* How does the SR morpheme select its pivot? A theory of switch-reference must derive the generalizations about pivots, in a way that is compatible with the morphosyntactic facts detailed in the last section.

3. *anti-pivot selection:* How does the SR morpheme select its anti-pivot? Is it identical to the pivot selection mechanism? If not, how does it get selected, and by what?

4. *anaphoric relation:* What kind of relation links the pivot and anti-pivot? How can we derive a reading of co-reference or disjointness?

In the next section I will discuss the first formal theory of switch-reference, reorganizing the argument in terms of these desiderata. I will also show how it is

inadequate for what is now known about switch-reference, while mentioning that much of its inadequacy comes from its dated formal mechanism.

2.4 The Binding approach

Daniel Finer, in his dissertation (1984) and ensuing article (1985), proposes an account of switch-reference that makes elegant use of a generalized version of Chomsky (1981)'s Binding Theory. He argues that switch-reference is an $\overline{\text{A}}$-pronoun at C° that acquires its index from the subject via T°.[17] This pronoun is then subject to the Binding Theory, generalized to apply between $\overline{\text{A}}$-pronouns. If it is a bound anaphor, it shows up as SS, and if it is a (free) pronominal, it appears as DS.

Finer builds on the observations that switch-reference tracks subjects and appears at clause junctures, but also makes important novel generalizations. First, he notes that switch-reference is structurally restricted. An SR morpheme is subject to locality constraints; it can only 'see' up to the next CP, and no higher. This generalization is based on two facts. One is that in a series of embeddings, SR cannot skip the clause immediately dominating it. The second is that when multiple clauses are embedded under the same clause, they all have the same anti-pivot.

A second generalization is that switch-reference is not dependent on discourse function or linear order. Instead, it depends on the grammar. Finer is the first to discuss the theoretical implications of the fact that it appears even when it is not necessary for disambiguation.[18] He also pointed out that switch-reference occurs on postposed embedded clauses, even if the SR morpheme was clause-final and 'backward-looking.'

---

[17] I update the category labels and terminology that Finer used to their modern equivalents. This includes the use of DP for nominal expressions, whereas he used NP

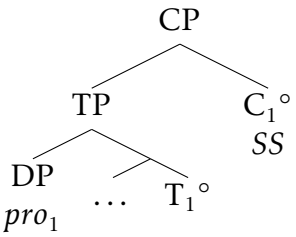
[18] The fact itself had been noted before, e.g., byMoser (1978) for the Seri language.

2.4.1 Finer (1984): SR as an $\overline{\text{A}}$-pronoun

Recall that any theory of switch-reference must contain four key desiderata: The nature of the morpheme itself, pivot selection, anti-pivot selection, and the anaphoric relation between them. Finer addresses the first desideratum, the nature of the SR morpheme, by assuming (by hypothesis) that the SR morpheme is an $\overline{\text{A}}$-pronoun at C°.

To address the second desideratum, pivot selection, Finer offers his most novel theoretical proposal. It is built on the empirical generalization that SR only tracks subjects. In generative syntax, the notion of subject is not a primitive; instead it is derived structurally— anything in a certain syntactic position is the subject. At the time, the subject was believed to merge at [Spec, TP], where it entered Spec-head agreement with T°.[19] By this Spec-head relation, T° assigns nominative case to the DP, and the DP's ϕ-features trigger agreement on T°, which ends up expressed on the verb. Also by this relation, the DP transfers its index to the T° head. In this way, T° acquires the index of the subject. So much is uncontroversial. But the SR morpheme is at C°, and has to acquire the subject's index. Finer explains this acquisition by claiming that C° forms a discontinuous constituent with T°. Thus, it will always have T°'s index.

(81)

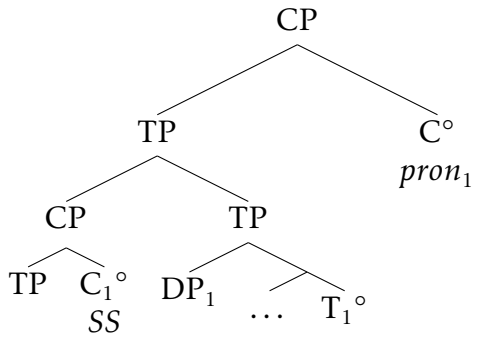


Finer's solution to the second desideratum provides the solution to the third, anti-pivot selection. Building off the generalization that anti-pivots are pivots, it stands to reason that anti-pivot selection occurs via the same mechanism as pivot

[19] It is now known that subjects arrive in [Spec, TP] by movement from an argument position, [Spec, *v*P].

selection, but in the dominant (anti-pivot) clause. The anti-pivot clause's subject transfers its index to T°, which forms a constituent with C°. The dominant C° has an $\overline{\text{A}}$-pronoun, which I will call *pron*.

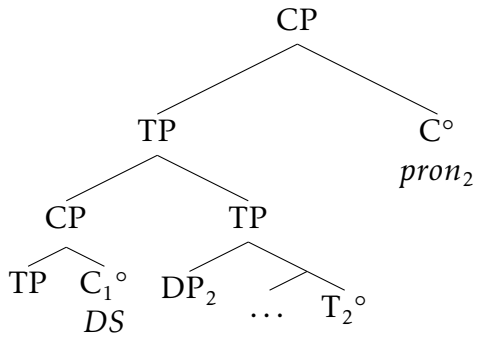
(82)



The fourth desideratum, the anaphoric relation, follows from the others, and comes for free with the Binding Theory. The SR pronoun at C°, like any pronoun, is subject to the Binding Theory. However, since it is an $\overline{\text{A}}$-pronoun, it cannot be bound by an A-pronoun. The only thing that can bind it is another $\overline{\text{A}}$-pronoun; i.e. the one at the dominant C° head. If the SR pronoun is bound, like it is in (82), Condition A dictates that it must be an anaphor. The anaphor form of SR is what we call SS. Since the $\overline{\text{A}}$-pronoun at C° in each clause is tied to the subject of that clause, this mechanism derives the co-referent subject effects of SS marking.

If the SR pronoun is free, however, Condition B dictates that it must be a pronominal. The pronominal form of SR is what we call DS. Since the $\overline{\text{A}}$-pronoun at C° in each clause is tied to the subject of that clause, we have derived the disjoint subject effects of DS marking. The SR pronoun is free when the dominant subject does not co-refer with the embedded one. The dominant subject transfers its index to T°, thence to C° (83). Since the SR pronoun is not $\overline{\text{A}}$-bound in its domain, it appears in its pronominal form, which we call DS.

(83)



This structure is infinitely recursive, so it captures the ability of SR to work with recursive CPs. It also captures Finer's observation that when a single matrix clause has multiple subordinate clauses, those clauses share an anti-pivot (section 2.2.2.1). If two clauses are embedded under one CP, the pronouns at each clause's C° head will have the same binding domain, the dominant CP, and will be free or bound with respect to the same dominant C° pronoun.

2.4.2 Problems with the Binding approach

The Binding Approach's utility and insight has made it the benchmark of theories of switch-reference in the generative literature. However, it is untenable as Finer presented it. It suffers from theory-internal conceptual problems, theory-related empirical problems, and it makes false predictions about switch-reference.

Two problems arise from using the Binding Theory. The first is that it overgenerates. Assume a configuration with matrix clause and an embedded clause with SS marking. The matrix clause has no SR morphology of its own. The SS morpheme is an $\overline{\text{A}}$-anaphor at the embedded C°, bound by an $\overline{\text{A}}$-pronoun at matrix C°. Since the matrix $\overline{\text{A}}$-pronoun is not bound, by Principle B, it must be free. If the $\overline{\text{A}}$-free form is spelled out as DS, it should appear as such at matrix C°, but it doesn't. This problem can perhaps be obviated by assuming that DS is a disjoint anaphor

rather than an unbound pronominal.[20] in this case, the unbound $\overline{\text{A}}$-pronoun at matrix C° would be null.

A second theoretical problem concerns inclusive or overlapping distribution. In a sentence like *When we went in, I sat down*, the subjects do not strictly co-refer, but they do share a subset of their referents. Langdon & Munro (1979) report similar results for the Yuman languages. However, in some languages, SS marking appears. For instance, in Diyari (Austin 1981: 316), SS appears if the pivot set intersects with the anti-pivot set.

(84) ngathu nganyja-yi, ngalda diyari yawada yathayatha-**lha**.
I:ERG want-PRES us two:NOM D. language:ABS speak-IMPL.SS
'I want us to speak Diyari'

In Kiowa, such marking is always DS (85).

(85) a. Bà hébòp**ē**, àn à tháumhébòp
ba– hé꞉b-op=ẽ꞉ ǽn a– tʔɔ́m+héb-op
[1pi] enter-IMPF=when.DS HAB [1s] enter-IMPF
'Whenever we go in, I go in first.' (f.n.)

b. *Bà hébòp**chē**, àn à tháumhébòp

This kind of co-reference poses significant problems for the binding approach. The first problem is getting the coreference to work at all. Finer proposes a kind of double-indexation he calls "diagonal binding," where the two share a group index; some languages, the group index is transferred to T/C° (resulting in SS marking), while in others, the individual index is (resulting in DS marking). This accounts for the switch-reference facts, but it is *ad hoc* and only works for switch-reference.

[20]Finer (1985) (fn. 12) raises this possibility, though not for this reason. Enç (1989) does follow this route, and offers an explanation for the null $\overline{\text{A}}$-binder at matrix C° (We will see in Chapter 4 that this explanation is unsatisfactory.) Broadwell (1997) proposes that DS in some languages is a pronominal, while in others it is a disjoint anaphor.

Generally speaking, anaphors subject to the Binding Theory are not attested to work this way in any language. There is no known language where something like *We like myself* or *I like ourselves* is grammatical. The idiosyncraticity of diagonal binding means that overlapping and inclusive reference are extremely problematic for a theory of switch-reference reliant on the Binding Theory.

A third, but weaker, problem with using the Binding Theory is discussed by Roberts (1988). The notion of binding domain required for the Binding Theory relies on c-command, which in turn relies on a subordinating structure. To undermine this reliance, Roberts offers several examples of switch-reference on coordinating structures, namely evidence from clause-chaining structures in Amele. As I pointed out earlier in this chapter, the configurational question is moot as a syntactic matter. Not only is the syntactic status of clause-chains unclear (Broadwell 1997), but it is well-accepted by now that coordinated structures involve structural subordination as well (Munn 1993; Johannessen 1998).

The problems listed here are difficult to reconcile with the Binding Theory, suggesting that it doesn't play a role in switch-reference. However, the Binding Theory was only proposed for the fourth desideratum; it does not concern the others, and perhaps it would be the only part of Finer's proposal that needs to be replaced. As it turns out, the accounts for the other desiderata have major problems as well.

The second and third desiderata involve pivot and anti-pivot selection. Finer accounts for these through the relation between T° and the subject, but he crucially depends on the generalization that pivots are always the subjects. This is simply not the case, even if we broaden the account to include whatever is the target of T°, whether or not it winds up in [Spec, TP]. For one thing, the notion of syntactic subject is not as clear-cut as it is in a language like English.

Broadwell (1997, 2006) describes a double nominative construction in Choctaw that has an effect on switch-reference.[21] DP possessors in Choctaw are unmarked (86). The possessum bears a possessor agreement prefix reflecting a 3rd-person dative (*im-*). However, in some cases, the possessor can be marked with a nominative; the verb then bears agreement reflecting a 3rd-person dative ((87), examples from Broadwell 2006).[22] In the related Chickasaw cases (Munro 1983), the possessum lacks possessor agreement.

(86) John **im**-ofi-yat ∅-illi-h

John 3s-dog-NOM 3s.SUBJ-die-TNS
'John's dog died.'

(87) John-at im-ofi-(yat) **im**-illi-h

John-NOM 3s-dog-NOM 3s.DAT-die-TNS
'John's dog died.'

Importantly, the higher nominative is visible to switch-reference, not the lower one that is the argument of the verb.

(88) John-at im-ofi' im-illi-tok-**oosh**[23], nokhą́klo-sh bínniili-h

John-NOM 3s-dog 3s.DAT-die-PAST-**SS** sad-SS sit-TNS
'Because John's dog died, he's sad.'

Examples like this demonstrate a crucial break between pivots and subjects. One might object that subjects merge at [Spec,*v*P], rather than at [Spec, TP]. Thus, it may be the case that the higher nominative is at [Spec, TP], where switch-

[21]The closely-related language Chickasaw has the same construction, and similar switch-reference effects (Munro 1983).

[22]Broadwell calls this structure *possessor raising*. Since I will not assume that raising actually occurs, and since the term 'possessor raising' is more widely used in the literature to describe a different phenomenon, I will simply call this a 'double nominative' construction.

[23]*-sh* is a morphophonological variation of *-t*.

reference can select it as a pivot. However, there are two problems with this objection. First, it would sever the link between nominative case and T°. Second, double nominative phenomena in unrelated languages[24] involve clearly topical high nominatives, and ordinary subject low nominatives. The Choctaw double nominative may be like these phenomena in more than a superficial way. If so, the SR is ignoring the subject (at or related to T°) for the higher nominative-marked DP, and Broadwell (1997) even claims as much. This phenomenon is informative and intriguing, and warrants more investigation through detailed fieldwork with Choctaw speakers.

Another concern with subjects is brought up by Farrell et al. (1991)'s discussion of switch-reference with passives in Seri. Notably, passive subjects are not selected as pivots. When an embedded passive subject co-refers to a matrix active subject, DS marking is obligatory.

(89) ʔp-po-a:ʔ-kašni *(**ta**)-x ʔp-si-o:ʔa ʔa=aʔ
1s-Irr-Pass-bite DS-UnsT 1s-Irr-cry Aux=Decl
'If I am bitten, I will cry'

(90) m-yo-a:ʔ-kašni kokašni šo m-t-aʔo *(**ma**)
2s-DistR-Pass-bite snake a 2s-Real-see DS
'You were bitten, after you had seen a snake'

On the other hand, if the passive subject is disjoint from a matrix passive subject, DS marking is not allowed[25] (there is no SS marking in Seri).

---

[24]Japanese (Kuroda 1972) and Hebrew (Doron & Heycock 2003)

[25]This fact suggests that the SR morpheme has the index of the anti-pivot, contrary to Finer's account, where it only has the pivot's index. In (89) and (90), the DS can be derived if SR has the anti-pivot's index, and signals disjointness to the unspecified subject. Likewise, the non-DS can be derived in (91) if there is no referent at all. One way to derive it is if the unspecified subject has some arbitrary index, and the two subjects co-refer. There is no overt SS marking, so nothing appears. Or, perhaps we could assume that in Seri, the use of SR presupposes reference of at least the anti-pivot or the pivot. Either way ought to work, depending on other facts. Notably, an account where SR only has the pivot's index cannot derive this fact.

(91) ʔa:t ki^{ʔ} p-a:^{ʔ}-ka: (*__ta__)-x ʔe:pol ki^{ʔ} mos

limberbush the IRR-PASS-look for DS-UNST ratany the also

si-a:^{ʔ}-ka: ʔa=ʔa

IRR-PASS-look for AUX=DECL

'If limberbush is looked for, white ratany also should be looked for.'

The authors suggest that this data can be explained if there are different types of subjects (they employ a Relational Grammar that distinguishes between active subjects and passive subjects), rather than the single structural subject of a generative approach. Even if we abstract away from the theory-driven hypotheses they propose, we see that the authors suppose that Seri passives contain an unspecified agent in the passive clauses, and switch-reference is sensitive to that subject instead of the overt one. This is an interesting supposition, since the object of the passive-marked verb still triggers subject agreement, not object agreement, though this is available in Seri. How might it work with a more modern generative theory? I can only speculate at this stage, without doing more fieldwork. That said, we can perhaps derive this unexpected switch-reference by assuming that passivization in Seri introduces a null quirky subject, perhaps a PRO_{arb}. The term *quirky* describes the case and agreement facts in phrases with a non-nominative subject, in languages like Icelandic. In (92), the subject (the liker) is dative-marked, while the object (what is liked) is nominative-marked, in apparent violation of theories of case assignment (An extensive literature has established that the dative-marked argument is in fact the subject.) Also, the verb agrees with the nominative object, rather than with the dative subject.

(92) Einum málfræðingi líkuðu þessar hugmyndir.

one linguist.DAT liked:**3P** these ideas.NOM.PL

'One linguist liked these ideas.' (Sigurðsson & Holmberg 2008, cited in Ussery (2009))

Quirky case depends on the predicate; in the case of Icelandic it depends on the verb. For Seri, however, perhaps a similar dependence can be derived from the $v°$ head that introduces the passive, rather than from the verb itself. Let's jump into formal structure for a moment. Assume that passive is introduced by a special head in the extended verbal projection (Kratzer 1996; Chomsky 2001), and further assume a link between T° and subject agreement. We can thus imagine a structure like (93) for (89) and (90). In this structure, a passive $v°$ head introduces an unspecified subject (PRO_{arb}), which is invisible to agreement at T°, perhaps through lack of ϕ-features. The agreement then picks out the internal argument, the DP in VP. However, the unspecified subject is visible to switch-reference. Assuming that switch-reference involves a relation with a head, then, that head cannot be the same T° head that triggers ϕ-feature agreement.

(93) $[_{\text{XP}}\ \text{X°}_{\text{DS}}\ [_{\text{TP}}\ \text{T°}_{[u\phi]}\ [_{v\text{P}}\ PRO_{\text{arb}}\ v°_{\text{PASSIVE}}\ [_{\text{VP}}\ \text{DP}_{\phi}\ \text{V°}\ ]\ ]\ ]\ ]$

In quirky structures, the actual subject does not trigger subject agreement; rather, either the internal argument does (if there is one), or a default agreement comes out. Since the Seri passive always has an internal argument, its triggering of agreement should come as no surprise. As far as speculation goes, this works out well. But I only offer the notion of null quirky subject based on Farrell et al. (1991)'s characterization of the facts. Based on accounts of quirky subjects in other languages, many other phenomena interact with the quirky structure. Thus, this conjecture suggests a large number of subtle empirical predictions that only fieldwork with Seri speakers could verify.

The two cases I have just discussed cast doubt on a strong link between pivots and subjects. Through the relationship of subjects to the T° head (either by Agree or Spec-head relationships), these phenomena cast doubt on a strong link between switch-reference and the T° head. Further evidence against relying on T° is empirical: sometimes, switch-reference ignores all the arguments in the clause.

Finer's account of the second and third desiderata also depend on the way that T° and C° are linked. Even assuming that T° is the relevant head. The notion that the two heads interact with each other is not controversial, but Finer proposes that T° and C° form a discontinuous constituent. This is implausible, since it is well established that discontinuous constituency is derived by movement. For instance, Percus (1997) argues that it-clefts are discontinous constituents, containing a right-extraposed relative clause and a pronoun replacing the null definite description. Benmamoun (1999) provides one of many proposals of quantifier float that involve discontinuity, and Fanselow & Ćavar (2002) show that some discontinuity is explained by the copy theory of movement, whereby the various parts of a moved constituent are spelled out at PF at different copies within the chain. Importantly, none of these accounts involve head movement. For T° and C° to form a discontinuous constituent, the SR pronoun (or all of C°) would have to move out of T°, while leaving the rest of T° behind.

This leaves the first desideratum, the nature of the SR morpheme. Finer proposes that it is an $\overline{\text{A}}$-pronoun at C°, but there are two problems with this. The first is that we have seen in section 2.2.1.4 that SR is introduced by its own functional head. Let's set that aside, and focus on Finer's account. The other problem is that it is not clear how the pronoun at C° is meant to be interpreted. Finer does not work out a semantics for his account, so any one we attempt is necessarily anachronistic. Still, even in a broad sense, the interpretation of SR does not work. I will only discuss this briefly here, and in detail in chapter 4. If there is an $\overline{\text{A}}$-pronoun at C°, there needs to be an element below it that will create an expression it can compose with. Typically, $\overline{\text{A}}$-pronouns saturate a property created by C°. The C° head bears an index that is shared with that of some pronoun (or a trace or a copy) in the clause. Following Heim & Kratzer (1998), the index at C° is interpreted as a λ-operator that binds the pronoun's index. This is essentially Predicate Abstraction,

and it creates a semantic property. The $\overline{\text{A}}$-pronoun either saturates this property or adds no semantic content; in the latter case, the CP expresses a property. The latter is exemplified with the relative pronoun *who*, in the relative clause *who I saw yesterday*.

(94) a. who $C°_1$ [I saw ~~who~~$_1$ yesterday] →

b. λ_1 [I saw x_1 yesterday] = λx. I saw x yesterday

Applied to Finer's theory, what this means is that if SR is an $\overline{\text{A}}$-pronoun, it cannot be at C°, but must rather be at [Spec, CP]. This is problematic, since it predicts that SR should be, like all specifiers, to the left of the clause, and never at the right edge. Also, if C° binds T°, T° must be interpreted as a bound variable, and it's not clear how that variable would be inserted compositionally. Furthermore, there is no compositionally satisfactory way for the two heads form a discontinuous constituent. Finally, the semantics does not distinguish between $\overline{\text{A}}$-binding and A-binding, so the pronoun at [Spec, CP] is in danger of being bound before the dominant C° head.

One final problem touches upon the first three desiderata. Roberts (1988)'s second objection to the Binding approach is that switch-reference ignores subjects altogether. Finer's use of T° to mediate between the pivot and C° is based on the generalization that switch-reference tracks structural subjects. Even the cases described above rely on some kind of subject or subject-like argument (the point was that they couldn't be at T°). However, Roberts demonstrates that switch-reference can ignore all the arguments in a clause. For instance, in (97), DS marking is used between the first two clauses, despite the subjects being co-referent. He writes, "The explanation given by native speakers for such instances is that 'something has changed' or this is 'a new situation'." (p. 60). The following example shows a shift from Mike starting the car to the journey to Sioba's house. DS marking

after the first medial verb indicates this shift; the subjects of the first and second chained clauses are identical.

(95) Mike uqa car tuli-do-**co**-b jic tod-u b-i Sioba na jo
M. 3s car start-3s-DS-3s road follow come up S. of house
cemenug ono uqa car heewe-ce-b taw-en.
near there 3s car hold-DS-3s stand-3s-RemPt
'Mike started the car and then followed the road up to Sioba's house and held the car as it stood there near the house.' (Roberts 1988:61)

Examples like (97) have been observed in many languages by many researchers. They raise an important question: If switch-reference is ignoring the subjects, what is it tracking? The next chapter will focus on examples like (97), and explore that question in detail. The answer will complete our understanding of switch-reference pivots. Armed with that understanding, we can begin to develop a working theory of switch-reference.

2.5 Conclusion

In this chapter, I have shown that relying on the morphological and syntactic aspects of switch-reference is insufficient for developing a full empirical understanding of its usage and structure. This insufficiency suggests that a look at the semantics is crucial.

In addition, I discussed the empirical generalizations we can make, and the four desiderata of a theory of switch-reference. I exposed major flaws with Finer's approach to switch-reference, which relies on Binding Theory. Indeed, it is insufficient for all four desiderata. However, a look at the semantics is important here, as well. Our understanding of binding, $\overline{\text{A}}$-phenomena, and pronouns has grown considerably since Finer's proposal. In light of that, a modern Binding approach might be successful after all.

For now, though, we need to explore the subject-ignoring cases of switch-reference. In the next chapter, I will discuss an alternative theory proposed by Stirling (1993), which addresses these cases, and is the first to explore the semantics of switch-reference in detail. Stirling follows Roberts in jettisoning the Binding approach[26]. However, as we will see, her theory is insufficient as well.

[26]I should note that both Roberts and Stirling worked from a perspective of functional grammar, so the Binding Theory was ruled out *ex ante* as a major factor in their proposal.

CHAPTER 3

SWITCH-REFERENCE AND TOPIC SITUATIONS

3.1 A cross-linguistic survey of non-canonical switch-reference

In this section I relate cases of switch-reference ignoring subjects in languages all over the world, and describe its major properties. First, this 'non-canonical' switch-reference can appear with SS or DS marking. Second, linguists have noted speaker judgments about the choice of SS or DS: It correlates strongly to continuity or shift in the 'scene' that the sentence is describing. Third, some cases do not seem to be about any particular scene, but simply a set of related events. Finally, an important and novel observation: non-canonical SR is not attested in subordinating configurations. These observations form the empirical foundation of the proposal about non-canonical switch-reference.

3.1.1 Switch-reference oblivious to subjects

Ever since Jacobsen (1967) first proposed switch-reference as a subject-tracking device, researchers adopted subject tracking as the basic function of the phenomenon. However, it was observed that this characterization is not completely correct. Dahlstrom (1982) shows that in Lakhota (Siouan, Dakotas), switch-reference sometimes ignores subjects. SR in this language is marked on the coordinating conjunctions *na* (SS) and *yũkʰã* (DS). In (96), we see three examples of SR from a text, split across two examples. The two clauses in (96a) have co-referent subjects, and SS marking appears on the conjunction between them, as Jacobsen's theory predicts. However, the third clause (96b) begins with DS marking despite having a subject co-referent with the previous one.

(96) a. kʰoškalaka nũp kʰolakičʰiya-pi **na** lila tʰekičʰixila-pi
young man two friend-RCP-PL **and.SS** very love-RCP-PL
'Two young men were friends with each other and loved each other very much.'

b. ... lila tʰekičʰixila-pi **yũkʰã** heniyos nũpʰila zuya iyaya-pi
very love-RCP-PL and.DS those two only to war set off-PL
'..and loved each other very much. One day, those two set off to war.'
(Dahlstrom 1982, (3))

Dahlstrom observes that switch-reference in this case and cases like it occurs with the unexpected value when the scene shifts or is particularly maintained. She proposes that the switch-reference marker seems to be working, but tracking something besides the subject. Roberts (1988) and Stirling (1993) made further observations, and Stirling explicitly distinguishes **canonical** switch-reference, which tracks subjects as expected, from **non-canonical** switch-reference (NCSR), which tracks unexpected items. The following subsections discuss other linguists' observations of non-canonical switch-reference.

Canonical switch-reference is found either in an SS (same subject) form or a DS (different subject) form. Non-canonical switch-reference is found to show up in both forms as well, even though it ignores subjects. Although subjects are irrelevant for NCSR, we will still use the abbreviations SS and DS for the two values of SR, as a matter of convenience.[1]

The following sections will show a strong correlation between SS and scene maintenance, and DS and scene shift. Investigation of data from many languages, collected independently by various researchers, shows that speakers routinely assign to non-canonical SS marking an indication of continuity in the 'scene', the

[1] As it turns out, given the analysis proposed later in this chapter, we can say that the 'S' in SS and DS stands for 'situation' when it does not stand for 'subject'.

place, or the time. Speakers routinely assign to non-canonical DS marking an indication of change in time, space, or scene.

3.1.2 Semantic observations concerning non-canonical DS marking

The most common use of non-canonical DS marking across languages is to indicate a change in scene. Often this change in scene is accompanied by a change in time or space. Dahlstrom (1982) was the first to describe this usage of DS marking, in her aforementioned paper on Lakhota.[2] She writes that "[DS] is a signal that the scene is going to shift, or that the next clause will introduce a new element. (p.74)"

Recall that the non-canonical DS marking in the second clause of (96) occurs despite the subjects of the two joined clauses being the same. However, the second clause indicates a change in scene, from the scene-setting introduction to the beginning of the core of the story. This shift is indicated in the English translation with the adverbial expression *one day*. There is no equivalent adverbial in the Lakhota text; the adverbial is an attempt to capture the flavor of the shift that is indicated by the switch-reference marking.

Roberts (1988) provides several examples of non-canonical DS marking from the Amele language (Gum, Papua New Guinea). He writes, "The explanation given by native speakers for such instances is that 'something has changed' or this is 'a new situation'." (p. 60). The following example shows a shift from Mike starting the car to the journey to Sioba's house. DS marking after the first medial verb indicates this shift; the subjects of the first and second chained clauses are identical.

[2] Another source of examples is Richard Lungstrum's dissertation (1995) on the use of DS marking in narrative in Lakhota.

(97) Mike uqa car tuli-do-**co**-b jic tod-u b-i Sioba na jo
M. 3s car start-3s-DS-3s road follow come up S. of house
cemenug ono uqa car heewe-ce-b taw-en.
near there 3s car hold-DS-3s stand-3s-RemPt
'Mike started the car and then followed the road up to Sioba's house and held the car as it stood there near the house.' (Roberts 1988:61)

Mixco (1997) gives several examples from Mandan (Siouan) that seem to indicate a shift from description of an individual to the presentation of an event. In the following example, the mythical character Coyote has experienced a fall. After this event, Coyote begins his journey. Between the fall and the journey, DS marking indicates a narrative shift. Once the story gets going, canonical SS marking links the events 'he got up' and 'he started traveling'.

(98) *kipxeak* *kirątErį* *kasi:wįowąkoʔš* *kirųwąʔkšis*
ki-pxe-ak ki-rątɛ-rį ka-siː-wį-oːwąk-oʔš ki-rųwąʔk-ši-s
mv-land-DS mv-get up-SS icpt-travel-prog-npst-Pma ?-man-good-def[3]
'Coyote landed, got up, and started traveling.' (Mixco (1997), p. 248)

Several other languages have attested non-canonical DS marking, although the particular sources do not discuss the nature of what is different. For instance, in his reference grammar of the Crow language (Siouan, Montana/Canada), Graczyk (2007) provides examples like (99). The subjects in all four clauses are the same, but the third connecting switch-reference marker appears as DS.

[3]The final word refers to Coyote. The question mark in the gloss is Mixco's; it represents a morpheme (*ki-*) whose meaning is uncertain. It looks like the middle voice marker, but apparently should not appear on the stative stem.

(99) chichíil-**ak** baatcháatt-aa-**(a)k** óolapi-ssuu-**m** daákaa-u-k
look for-SS outstanding-CAUSE-SS find-NEG.PL-DS go home-PL-DECL
'they searched for him long and hard, they didn't find him, they went home.'

Kiowa texts also have examples of NCDS marking scene shift. Here is one from a story recounted by Palmer, Jr. (2003), which was told to him by Oscar Tsoodle. In the following example, some hunters have been chasing after a deer. The narrator recounts the chase heading in one way, then all of a sudden, the direction changes. This shift is marked by DS marking on the coordinating conjunction.

(100) a. Óp á ə̀lə̀
óp á- ʔaːl-eːʲ
there [3p:3s]- chase-PF
'They$_1$ chased it over there'

b. **nègáu** óp jáuchò á ə̀lə̀
nɔ̃=hegɔ́ ʔóp tɔ́=tso ʔá- ʔaːl-eː
and.DS=then there like this=instead [3p:3s]- chase-PF
'And then they$_1$ chased it this way' (Palmer, Jr. 2003)

In (101), from the Nêlêmwa language of New Caledonia (Bril 2004), DS is used even though the subjects are the same.

(101) hla tu kuut bwa on **ba** hla axi bon ...
3pl go.down stand on sand **and.DS** 3pl see seagull ...
'They go down to the beach and then they see the seagull.'

In light of this data, it may come as no surprise that non-canonical DS marking is commonly found at the beginning of 'paragraphs', or episodes in texts. Watkins (1993) reports this as a common use of non-canonical DS marking in Kiowa, and

Lungstrum (1995) even argues that switch-reference's main function in narration is to delimit 'episodes'.

Besides simply marking a scene change, non-canonical DS marking is also reported to indicate distance in space or time. In (102), DS marking indicates a long time passing between the first event (doing that in November 1977), and the second (leaving it for us). Roberts does not provide further context to clarify just how long had passed, but captures this shift in the translation, with the English adverbial *then*.

(102) Eu 1977 jagel November na odo-**co**-b cul-ig-en
that 1977 month N. in do-DS-3s leave-1p-3s-REM.PT
'That was in November 1977 that he$_1$ did that and then he$_1$ left it for us.'
(Amele, Roberts 1988)

In the Western Desert language Pitjantjatjara, Bowe (1990) notes that "clauses beginning with a new time and place (p. 97)" take DS marking (*ka*), even though they have the same subject. Note that here, the second clause does not contain a time or place adverbial, though one appears in translation.

(103) a. Pula ngalkula wiya-ri-ngkula ngari-ngu
3d.NOM eat-MERGE NEG-INCH-MERGE lie-PT
'When they$_1$ both had eaten it all they$_1$ lay down.'

b. **Ka** kunyu palu-mpa mama ngunytju-ku ngura
and.DS EVID 3s.GEN father mother-GEN place
ila-ri-ngu-lta
near-INCH-PT-EMPH
'They$_1$ were really getting near their mother and father's place now.'

In (137), another example from Lakhota, there are three clauses, all with the same subject (the speaker). The first two clauses are joined with canonical SS mark-

ing, while the second and third are joined with non-canonical DS marking. The shift in time is captured in the English translation by the adverbial *later on*.

(104) wak^{h}alapi blatke **na** wagli **yuk^{h}a** č^{h}ahapi ewaktuže poetušni
coffee 1-drink and.SS 1-go home and.DS sugar 1-forget buy-NEG
'I had some coffee and went home.
Later on I realized I had forgotten to buy sugar.' (Dahlstrom 1983)

Of course, scene shifts also generally include changes in space and time, so it is likely that spatiotemporal shifts can simply be included into scene shifts. That is, whatever DS is indicating as different ought to vary based on scenes, locations, or times.

3.1.3 Semantic observations concerning non-canonical SS marking

Non-canonical SS marking is found when the highest nominal arguments of two joined conjuncts are disjoint, yet SS marking appears. Its most commonly attested use is to highlight scene continuity despite a change in subject. However, its attested use in Kiowa suggests that like non-canonical DS marking, non-canonical SS marking is sensitive to something more complex than just a scene.

3.1.3.1 Scene continuity

Non-canonical SS marking often indicates the continuity of a scene across two clauses, even if they do not share a highest nominal argument. For instance, in (105), there are three clauses. The first two have identical subjects, and are linked, as expected, by a SS marked coordinating conjunction. The second and third clauses, however, are linked by SS marking even though the subject of the third clause is the man placed on the pyre (as Dahlstrom notes, the verb lacks plural subject agreement).

(105) čʰã ota ileya-pi **na** el ixpeya-pi **na** hečʰel xuɣnaɣe
wood much make.burn-PL and.SS on place-PL and.SS thus burn_up
'they set fire to a lot of wood and they placed him on it and he burned up.
(~ "was in a burned-up state")' (Lakhota, Dahlstrom 1982: 73)

SS marking is also used to indicate a particular kind of scene continuity: More than one clause is describing a scene seen by a participant, as if we have 'zoomed in' on it. In (106), from the Mojave language, SS marking is used between the first and second clauses, and second and third, even though the subjects differ. They are linked by being the object of the sight of the subject of the last verb— they are all included in what this person saw. Notably, the clause describing the seeing is separated from what was seen by DS marking.

(106) ko:-vch hak wa:-**k** yasé'k han-dav-**k** ha-k wa-**m** nya ha:m
pine-DEM there lie-SS shade good-very-SS there-LOC lie-DS that see
'There was a pine tree there and the shade was very good; the pine tree was there and she saw that at a distance.' (Mojave, Powskey et al. 1980: 65)

A similar sense comes from the following example from Crow: The boy looks over at the campsite, and what he sees is described in a pair of clauses that are linked by SS marking. Like in the Mojave example, the seeing and what was seen are linked by DS marking.

(107) chiláakshe shikáakee-sh asall-**ák** kuss-íkaa-lee-**m** ashé ah-**ak**
morning boy-DET go_out.SS GOAL-look-!-DS lodge many-SS
bilaxpáake chiwakálaa-**(a)k** dahkú-**m**
people go_back_and_forth-SS continue-DS[4]
'in the morning the boy went out, he looked in the direction of [the old campsite], and to his surprise, there were lots of lodges, and people going back and forth. (Crow, Graczyk 2007: 415)

3.1.3.2 Shared purpose

Watkins (1993) reports another use of non-canonical SS marking, this time in Kiowa. In (108), the two subjects are distinct individuals, but SS marking is grammatical and felicitous. However, Watkins's consultant's judgment does not involve anything involving an apparent scene. Instead, it links two events that are spatiotemporally noncontiguous by their shared purpose.

(108) Kathryn gà gút **gàu** Estheràl gà gút.
K. gʲæ- gú? gɔ E.=al gʲæ- gú?
K. [3s:3p] write.PF **and.SS** E.=too [3s:3p] write.PF
'Kathryn wrote a letter and Esther wrote one too.' (Watkins, 1993)

My native speaker consultants affirmed this judgment, and it will be discussed in detail in section 3.3. It raises an important question for switch-reference: What kind of semantic object includes scenes and episodes, and also things like events linked by shared purpose?

3.1.4 Configuration and non-canonical SR

Another important property of non-canonical switch-reference concerns the type of clause juncture it occurs with. Switch-reference is widely observed with subordinating conjunctions, as well as with coordinating ones. However, non-canonical switch-reference has not been described as occurring in configurations that are clearly subordinating. An examination of the descriptive literature leads to a clear observation: Non-canonical switch-reference is found only with coordination or with clause-chains.[5] For instance, the Muskogean languages are well

[4]The DS marker on the last verb indicates that this is not the end of the sentence (SR in Crow occurs only on clause-chains), but this is the end of the example as published; it is an excerpt from a Crow narrative.

[5]Clause chains' configurational status is undetermined, but with respect to switch-reference they behave linearly, like coordination.

observed to exhibit switch-reference with a variety of subordinating conjunctions, but no cases of non-canonical SR have been observed.

Most switch-reference languages only have the phenomenon on one type of clause connection. Kiowa is a rare language, for it has switch-reference on coordinating and subordinating connectives.[6] Watkins (1993) found that non-canonical switch-reference[7] occurs only on the coordinating conjunctions *gàu/nàu*, and my fieldwork will confirm this finding in section 3.5.

The only language I have found besides Kiowa with SR in both configurations is the Australian Western Desert language Pitjantjatjara.[8] Bowe (1990) writes that "clauses beginning with a new time and place (p. 97)" take DS-marking (*ka*), even though they have the same subject. *Ka* is a DS-marked coordinating conjunction; clause-final switch-reference marking subordinating conjunctions are not attested to be used in this way.

This configurational difference is pervasive and important enough to require any complete theory of SR to account for it. It is also intriguing, for two reasons. The first is that there is no apparent syntactic motivation behind it. As discussed earlier, one of Roberts (1988)'s arguments against Finer (1984)'s Binding Approach relies on coordination having a syntactic structure that prevents binding. Standard theory now holds coordination to be a special kind of subordination. Conjuncts are either adjoined (Munn 1993) or enter a Spec-Comp relationship to a head (Johannessen 2000), but either way they are subordinated. There is no *syntactic* difference between the two configurations that could account for this observation. However, canonical and non-canonical SR do not track the same objects. Therefore, we must

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[6] I speculate on the reason for this in Chapter 1.

[7] Watkins describes it as 'discourse functional' SR.

[8] What is unclear is the question of languages with switch-reference on subordinating particles and on clause chains. One such language is Choctaw. Of course, if the Choctaw clause chains are subordinating, as Broadwell (1997) demonstrates, we should expect no non-canonical SR at all.

explore semantic correlations between the types of configurations and the different targets of SR.

3.1.5 An important ambiguity

Non-canonical switch-reference has been attested in many languages, always on coordinating conjunctions. However, it is only attested when it is plainly visible. A key tacit assumption in the literature is that any case that is not evidently non-canonical is canonical. However, we should question that assumption, because in any case in any language where switch-reference on a coordinating conjunction bears its expected value, the SR could be canonical or non-canonical.

This is the case for simple examples like (109). This example might seem obviously canonical, but absent an understanding of what NCSR tracks, and a way to distinguish what SR is tracking, it is actually not clear whether it is canonical or non-canonical. In section 3.4, I will use semantic fieldwork techniques to examine this issue.

(109) Dè hâ **gàu** à tép
de– hâ gɔ ʔa– t^{h}ép
[1s:refl] stand up.PF and.SS [1s] exit.PF
'I stood up and I left.'

This ambiguity raises an important methodological issue. When we as researchers encounter an expected switch-reference marker on a coordinating conjunction, how can we be absolutely certain of its canonicity? This issue is particularly acute for doing descriptive work, because with texts alone, the ambiguity simply raises a question only fieldwork can answer. Through elicitation, working with speakers— even with follow-up contexts, we can rely on their robust intuitions to control for canonicity.

For example, let us examine such a case, taken from a text about the so-called "Cut-throat Massacre" of 1833. It describes the events surrounding the massacre of a Kiowa camp by marauding Osage warriors. The atrocity stands out in Kiowa history, not only for its horrific outcome, but also because it led to the Kiowas' first recorded encounter with the U.S. government. Watkins (1993) reports that in Kiowa narratives, non-canonical DS marking can be used to mark the beginning of a new epsiode in the story.[9] The switch-reference marker in this example appears at such an episode boundary.

Episode 1: Having learned of a nearby party of enemy Osages, the Kiowas are debating whether to move their camps. One band leader, the narrator's grandfather, appeals to his wife's late-term pregnancy as grounds to flee to the hills.

(110)

Kṑ̱jè	hègáu		jṓ̱nê,	"Nā́u,	hóldé	bá
kʰõ̀ːʷte	hegɔ́	∅–	tɔ̃́ːʷ-nẽ̂ːʲ,	nɔ̃́ː	hóldé	bá–
Grandfather	then	[3s]	say-IMPF.EVID	Now$_{intj}$	hurriedly	[1p]

kṑcàuètmā̀u	bôt	mā̀yí	é̱	ílbé…
kʰoː+kɔeʔ+mɔ̃ː	bôːʷt	mãːyíː	ʔẽ́	ʔílbé
now+fearfully+decamp	because	woman	[∅:3s:1s]	be unsteady

'Then Grandfather said, "Now, we should break up camp quickly, because my wife is pregnant…'[10]

Episode 2: All the camps but one move, and encounter difficulties along the way.

Connecting these episodes is a DS marker. The form, *nègáu*, is a contraction of the DS conjunction *nàu* and the adverb *hègáu*, 'then'. Note that the anti-

[9]Lungstrum (1995) makes a similar point for Lakhota.

[10]The ellipsis stands in place of the rest of the quote, which continues (in translation): "She could deliver any minute, so let's break up camp and head to the mountains."

pivot clause connected by the conjunction is the matrix clause "Grandfather said (quote)."

(111) **Nègáu** gá kùtèl-hèl gàu jḗ háundé gà

nẽgɔ́ gʲǽ– kʰutel-hel gɔ téːʲ hɔ́̃ndé gʲæ–

and.DS:then [3p:3p] pull stakes.PF-EVID and.SS all things [3s]

òlpá̲idéhèl gìgáu qópfégù ém

ʔol+pʰā́jde-hel gigɔ́ kʔóp-péːʲgu ʔẽm–

bundle up.PF-EVID and.SS:then mountain-toward [3p:refl]

hṓà̲uzònhèl.

hóːʷ+ʔɔ̃ːzõn-hel

drive+leave.PF-EVID

'And so, they pulled up stakes and bundled up all their possessions and drove off towards the mountains'...'

Because this DS marker is located an easily noticed episode boundary, we might suspect that it is indicating a change in topic situation. However, the subjects of the two sentences (Grandfather; the Kiowa band), are also different. So, is this DS marker canonical or non-canonical? We could consult native speakers for their intuitions about this example, but the best way to be sure is to elicit with novel but similar contexts.

3.1.6 Summary

In this section, I have introduced the notion of non-canonical switch-reference, observed in languages around the world. I showed that speaker judgments gathered by many different researchers are similar enough to warrant analysis as a single phenomenon with a single explanation. In the next section I will discuss and dismiss the most well developed account of it, before proceeding with a more successful one.

3.2 The Bundling Approach

Several researchers have used non-canonical switch-reference to argue that switch-reference indicates coherence rather than co-reference. Givón (1983) and Rising (1992) independently claim that it signals topic continuity, and Ariel (1990) suggests that it is governed by an accessibility relation. Keine (in press) goes a step further, with a proposal that relies solely on coordination type. Each of these lesser-known proposals has empirical problems, but these stem from the proposals not having been thoroughly developed,

Lesley Stirling (1993) develops a theory of switch-reference that derives the coherence effects (i.e., scene-tracking) from the nature of the object that switch-reference is tracking. She examines non-canonical switch-reference in the Amele language (Gum, Papua New Guinea), and provides the first semantic account of the phenomenon, which differs significantly from the purely structural Binding Approach.

3.2.1 The basic idea

Stirling claims that switch-reference is not a reflex of the structure of various items tied to the subject. In fact, switch-reference does not deal directly with co-reference at all. Instead, the morpheme expresses a sort of 'agreement' between the eventualities introduced by each clause's verb. To account for this agreement, Stirling conceives a *structured eventuality index*, which not only provides an index for the assignment function, but provides more detailed information in a set of eventuality parameters whose values denote certain properties of the eventuality, including the agent. These parameters either match or do not, and whether they do is the source of the agreement (SS marking) or disagreement (DS marking) indicated by switch-reference.

That is to say, Stirling's approach bundles together a set of co-references to derive SS or DS marking. I call this the Bundling Approach, in contrast with Finer's Binding Approach. Bundling attempts to account for non-canonical SR by eliminating any meaningful difference between canonical and non-canonical switch-reference. Both are derived from the same mechanism, which allows NCSR whenever the subjects happen to be disjoint.

While Stirling's approach is very insightful for recognizing the importance of semantics, and clever in its use of co-reference to derive apparent coherence effects, it encounters several major flaws that prevent its adoption. First is that the proposed mechanism is idiosyncratic and hard to generalize. Second is that it relies on the reference of Davidsonian events, which don't refer. Third is that it makes several predictions that are too strong: It cannot account for events that are not spatiotemporally contiguous, and it cannot account for non-canonical SS marking. These predictions can only be ironed out if we severely weaken the theory, and since even the strong version has no independent motivation to support it, there is no reason to keep it.

3.2.2 Critique of the binding approach

Stirling builds on Roberts (1988)'s article on switch-reference in Amele, which offers several points against the Binding Approach. Roberts had argued that clause chains were examples of coordination, which would violate the Finer's declaration that switch-reference only appears with subordination. Of course, this point is moot in light of current syntactic theory. Besides, Stirling remains agnostic as to the syntactic status of clause chains (as I point out in section 2.2.2.3), because they seem to be *either* coordinating or subordinating. However, she points out two faults with the Binding Approach's reliance on subjects: Switch-reference in Amele

seems sensitive to agents, not subjects; and switch-reference does not always track subjects.

3.2.2.1 Switch-reference is sensitive to agentivity

Stirling claims that switch-reference is not sensitive to a structural notion of subject, but is sensitive to a semantic concept of agentivity. This claim is based on the behavior of switch-reference in Amele with non-agentive subjects. Agentivity relates the property of entities that are agents of a given event. The exact semantic nature of agentivity is still a matter of debate, but it is generally accepted that volition is its condition *sine qua non*. Stirling proposes as a 'universal' that switch-reference tracks only DPs with an agentive feature (p. 222), which is typically on subjects.

As evidence, she argues that non-canonical SS marking occurs when the anti-pivot clause (the first of the two) has one of these properties:

1. The 'subject' is an experiencer topic that is object marked:

   (112) Ija co-cob-**ig** cucui-te-i-a
   I SIM-walk-1s.SS fear-1sO-3s-TODPT
   'As I walked, I was afraid.' (Stirling 1993: 85)

2. The 'subject' is an inalienably possessed body part. In (113), the subject of the pivot clause is the possessed 'eyes'.

   (113) Ija ta-taw-**ig** ija am-i wal-do-i-a
   I SIM-stand-1s.SS I eye-1s spin-3sO-3s-TODPT
   'As I stood, my eye(s) spun (= I became dizzy)' (Stirling 1993:86)

3. The clause has a non-agentive inanimate subject.

(114) M-i he-du-**me**-i ceta wal me-ce-b ...
put-Pred finish-3sO-SS-3s yam ripe become-DS-3s ...
'He finished doing that and then since those yams were ripe...' (p. 87)

Stirling proposes that what unifies facts like (112-114) is that switch-reference tracks an agent. That is, the lack of agent in the anti-pivot clause allows the agent pivot to carry over and be the agent of the pivot clause. The actual agent-tracking mechanism is syntactic— the semantic feature of agenthood is represented by a syntactic feature that switch-reference is sensitive to. While this is not implausible, it is difficult to put into place because there is no agent argument in the anti-pivot clause. It is also empirically implausible to expect 'he' in (114) to be the agent of 'those yams were ripe', simply to meet the demands of the theory. If 'he' is not the agent, then SS is simply indicating the non-change of agent. However, Stirling's own mechanism relies on coreference of agents, so it would not work.

3.2.2.2 Non-canonical switch-reference

Another problem with the Binding approach is that switch-reference is not restricted to subjects, or even the highest nominal argument. This is non-canonical switch-reference. Non-canonical SR is used with regular meanings. Roberts reports that native speakers of Amele indicate that "something has changed," and points out that what is different is 'deictic'— the place, time, or world of the event. For instance, in (115), the location has changed.

(115) Age ceta gul-do-**co**-bil li bahim na tac-ein
They yam carry-3s-**DS**-3p go-PRED floor on fill-3p.REMPT
'They carried the yams on their shoulders and went and filled up the yam store.' (Roberts 1988, 61)

The Binding Approach depends crucially on the index transfer from the subject to switch-reference via the T° and C° heads. Examples like (115) show that switch-reference can ignore the subjects completely, showing up as DS even though the subjects co-refer. Roberts does not dwell long on possible theories of switch-reference; his main point was arguing against the Binding Approach. Stirling builds on Roberts's findings and proposes an account of switch-reference that would explain these facts.

3.2.3 Switch-reference indicates eventuality agreement

Stirling proposes that switch-reference relates the eventualities of the two clauses, rather than their subjects. This proposal has the welcome effect of explaining why switch-reference so often appears on verbs— it's tracking one of the verb's arguments. It also explains switch-reference markers' common co-occurence with markers of sequential tense, which temporally sequence two eventualities. Stirling argues that there seem to be aspectual effects from the use of switch-reference. Thus, it seems more plausible to propose eventuality tracking rather than entity tracking.

3.2.3.1 Switch-reference does not track eventuality reference

Stirling proposes that switch-reference is not a reference-tracking device *stricto sensu*. It does not track the *reference* of eventualities. Rather, it marks a novel kind of agreement between the eventualities introduced by the verbal predicates of two joined clauses. In terms of modern semantic theory, this eventuality corresponds to the Davidsonian event argument. We can thus recast Stirling's proposal as follows: Switch-reference marks agreement between two Davdisonian events.

This account relies on agreement between events instead of identity because of the way events are used in sentences. One key property of Davidsonian event arguments of verbs was demonstrated by Krifka: They must be existentially bound in

each occurrence.[11] Krifka proposed existential closure mechanisms to introduce this binding. Here, we assume a theory of tense based on Kratzer (1998), where aspect provides this existential operator. This is important for switch-reference, because the use of existential quantification is infelicitous to describe entities already mentioned in the discourse. Therefore, no matter how the existential quantification over the event argument is implemented, its necessity means that the Davidsonian event in each clause is disjoint from that of any other clause.[12]

Consequently, if switch-reference tracked event reference, there would be nothing but DS marking, because every clause would have a different event. This conclusion is quite evidently false, so Stirling deduces that switch-reference cannot simply be indicating co-reference. Instead, she proposes that it indicates a kind of agreement between the eventualities. This agreement is based on whether or not the events match along certain parameters, whose definition allows a way to connect switch-reference with subjects.

3.2.3.2 The structured eventuality index

When Stirling introduces 'agreement', it does not describe what the term usually refers to (i.e., a relation between syntactic heads or the morphological reflexes of such relations).[13] Instead, it refers to a novel form of concord between parameters of the events.

For SR to access these parameters in a systematic way, Stirling creates a formal mechanism for events called a **structured eventuality index** (SEI). The SEI is a triple, consisting of:

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[11] Stirling simply assumed this property of eventualities; her discussion backs up that assumption.

[12] A possible exception might arise in serialized verbs.

[13] Stirling is using a functionalist syntactic framework anyways; the concept of agreement in the generative sense has no import in her analysis.

1. *Id* is the eventuality's referential index. It is a uniquely identifying integer 1,2,3,...,n;

2. *Aspect* is a sorted eventuality variable, chosen from *e* for an event, *s* for a state, *a* for an aspectually unspecified eventuality, and perhaps others; and

3. *Parameters* is a parameter list, made up as follows:

   (a) the *protagonist* is an individual discourse marker, $x \in \{ x_1, x_2, \ldots x_n \}$. The protagonist is the agentive subject of the eventuality.

   (b) the *location* is a sorted discourse marker, $l \in \{ l_1, l_2, \ldots l_n \}$, which denotes spatiotemporal location.

   (c) *actuality* is a value in the set {actual, non-actual}.

Of these, only the Parameters are important for SR. Indeed, it seems that only the Parameters are even plausible. *Id* provides an index for the events, but Davidsonian events (those associated with the verb) are existentially bound in their sentences. They do not refer, and should not have referential indices, especially lexically-assigned ones. Lexical *Aspect* has not been shown to be relevant to SR in the literature. Its effects appear through the interaction of the verb, its arguments, and viewpoint aspect. Stirling includes *Id* and *Aspect* for completeness, and to help differentiate events, but since differentiating them is not the role of SR, they are unnecessary. However, we will continue to include them in describing the analysis.

Each event variable used is lexically assigned an SEI. In a sentence like (116), we have arbitrarily assigned *Id*'s to every variable.

(116) Robert_3 came in_2.

(117) $[2, e, \langle x_3, l_1, actual \rangle]$

When switch-reference compares the eventualities of the joined clauses, it does not compare their *Id*, which would be necessarily disjoint. Instead, it compares

only the parameters: If the two eventualities have identical parameters, they agree, and SS appears (118). If they differ along any of the parameters, DS appears (119). This captures the standard apparent subject tracking, as shown in (118).

(118) uqa jo l-i-me-i sigin qee o-l

3s house go-Pred-SS-3s knife NEG get-3s.NEG.PT

'He went to the house and didn't get the knife.' (Roberts 1988:112)

he went = [1, e , $\langle x_1, l_1, actual \rangle$]
he didn't get the knife = [2, e , $\langle x_1, l_1, actual \rangle$]
x_1, l_1, actual = x_1, l_1, actual → SS

(119) Uqa ho-co-b sab je-i-a

He come-DS-3s food eat-3s-TODPT

'He_1 came and he_3 ate the food.' (Stirling 1993: 207)

he came = [1, e , $\langle x_1, l_1, actual \rangle$]
he ate the food = [2, e , $\langle x_3, l_1, actual \rangle$]
x_1, l_1, actual ≠ x_3, l_1, actual → DS

In essence, switch-reference tracks protagonists, locations, and worlds, but only indirectly. The pivot clause's eventuality's agreement depends on the values of all three items bundled together within the eventuality description. Due to this collocation, I will refer to Stirling's theory as the Bundling Approach.

Bundling accounts for the cases of shift that Roberts first described. For instance, in (120), the subjects are identical, but the locations are different. This drives different indices for location. Switch-reference finds that the events' structured indices are different, so appears as DS.

(120) Age ceta gul-do-**co**-bil li bahim na tac-ein
3pl yam carry-3s-**DS**-3pl go-Pred floor on fill-3pl.REMPT
'They carried the yams on their shoulders and went and filled up the yam store.'

carry = (e_4, e , $\langle x_4, l_9, actual \rangle$)
go and fill = (e_5, e, $\langle x_4, l_7, actual \rangle$)
x_4, $\mathbf{l_9}$, actual $\neq$ x_4, $\mathbf{l_7}$, actual $\rightarrow$ DS

3.2.4 Problems with the Bundling Approach

The Bundling Approach offers an insightful account of switch-reference that covers canonical and non-canonical use. However, a critical look discovers major problems that cannot be repaired.

3.2.4.1 Lack of motivation for the SEI

One major problem is the idiosyncraticity of the structured eventuality index. Its only apparent purpose is to handle switch-reference, but it has no independent motivation in any other structure in any other language, especially once we strip it of the parts that have nothing to do with switch-reference. This is a problem for any universal account of switch-reference based on an SEI, but not a fatal one, so long as it accounts for switch-reference. However, looking at the two major Parameters, agentivity and location, we see that it fails.

3.2.4.2 Arguments against the relevance of agentivity

Stirling proposes that what unifies facts like (112-114) is that switch-reference tracks an agent. That is, the lack of agent in the anti-pivot clause allows the agent pivot to carry over and be the agent of the pivot clause. This is problematic for two reasons. First, it isn't clear how SS marking could access the agent feature in an anti-pivot clause that has no agent. Second, it is empirically implausible to expect

'he' in (114) to be the agent of 'those yams were ripe', simply to meet the demands of the theory. If 'he' is not the agent, then SS is simply indicating the non-change of agent. However, the mechanism for SS marking relies on coreference of agents, so it could not easily account for this.

Broadwell (1997) also provides empirical evidence against agentivity as a criterion for switch-reference pivots, by showing that it cannot extend to other languages. He uses a clear case in Choctaw (Muskogean, Mississippi/Oklahoma) where the agent of the event described by the verbal predicate is ignored by switch-reference. This case involves a phenomenon known in the Muskogeanist literature as *possessor raising*. Possessor raising in Choctaw should not be confused with the phenomenon in European languages that is sometimes given the same name.[14] Possessed DPs can serve as subjects of a Choctaw sentence (121a), like in English. However, the possessor can be 'raised' out of the DP to an external position, where it receives nominative case. This argument is then reflected as an oblique in the verbal agreement system (121b).

(121) a. Oblaashaash John im-ofi'-at illi-tok

yesterday John 3s.OBL-dog-NOM die-PT
'Yesterday, John's dog died.'

b. John-at oblaashaash im-ofi'-(at) im-illi-tok

John-NOM yesterday 3s.OBL-dog-(NOM) 3s.OBL-die-PT
'Yesterday, John's dog died.'

There is no way for raised possessor *John* to be construed as the agent of the predicate. But switch-reference is sensitive to the raised nominative argument, not the agent of the predicate. Thus, (122) is only felicitous if John bit the speaker, not his dog.

[14] *Possessor raising* in this sense involves raising the possessor of a direct object to the object position, as in the French *Ils m'ont coupé le bras* 'They cut my arm off.'

(122) John-at ofi'-at im-ambiika-took [sa-kisili-tok-**at**]
John-NOM dog-NOM III-sick-PAST 1sPP-bite-when.SS
'John$_1$'s dog$_2$ was sick when he$_1$ bit me.' (Broadwell 1997)

In addition to the Choctaw case made against the Bundling Approach, a look at the literature finds evidence from many Australian languages against a role for agentivity. Many ergative languages employ switch-reference; Austin (1981) reports that they all ignore ergativity— SS indicates two subjects, even if one is an agent and the other is not. Here is a pair of examples, from the Diyari language. In (123), the SS marker indicates subject co-reference across clauses, even though the pivot bears ergative case, and the anti-pivot bears nominative case. In (124), DS marking indicates subject disjointness, even though the absolutive argument of the pivot clause is the subject of the anti-pivot clause.

(123) nhulu puka thay-rna, nhawu pali-rna warrayi
he-ERG food-ABS eat-NONFUT.SS he-NOM die-PTP AUX
'While eating some food, he died.

(124) karna-li wilha nhayi-yi, kirli-rnanhi
man-ERG woman-ABS see-PRES dance-NONFUT.DS
'The man sees the woman dancing.' (Austin 1981: 318)

It turns out that these facts do not by themselves condemn the Bundling Approach. They only render the agent condition on Protagonists unfruitful. The exact nature of the protagonist would need to be redefined, perhaps as some kind of topic. Ultimately, though, other evidence undermines crucial predictions of the Bundling Approach, and renders moot the need to incorporate any notion of Protagonist into the bundled SEI.

3.2.4.3 Predicts that location difference triggers DS

The Bundling Approach makes a very strong prediction: Differences in spatiotemporal location should trigger DS marking. For SS marking, events would have to share a location. They would have to be cotemporaneous, and spatially at the same place. Of course, the notion of 'same time' can be vague, but even so, it predicts that clearly different locations trigger DS marking. However, SS marking can be used when the clauses' events are spatiotemporally non-contiguous. For instance, in Watkins (1993)'s example ((108), repeated in the next subsection), SS marking is available to describe a 'shared purpose', even though the two letter writing events are separated by a wide distance. More importantly, even if the agents co-referred, a significant change in location would require DS marking. Examples like (125) are easy enough to elicit or encounter, and show this a change in location does not always suffice for DS marking.

(125) Normancà mà kàulésàujèvàigàu **gàu** Carnegiecà mà
N-kʲæ mã– kʰɔːlé+sɔːte+pʔajː-gɔ gɔ C.-kʲæ mã–
N.-at [2di:3p] together+work+fight-PF and.SS C.-at [2di:3p]
kàulésàujèvàigàu.
kʰɔːlé+sɔːte+pʔajː-gɔ
together+work+fight-PF
'We've worked together in Norman, and we've worked together in Carnegie.' (f.n.)

In (125), the speaker is referring to two separate events of working togther, in cities 82 miles (132 km) apart. These cities are not culturally the same place, either. The subjects/agents of each clause co-refer, so we get canonical SS marking, but under a Bundling Approach, the disjoint locations would force DS marking.

I will discuss more examples like this in detail in section 3.4.5.1, where I argue against the use of locations by themselves in light of the situations-based proposal

of this chapter. But for now, even one example like (125) demonstrates that the Bundling Approach is too strong.

3.2.4.4 Predicts that non-canonical SS is unavailable

The Bundling Approach makes a very strong prediction: Non-canonical SS marking is unavailable. For non-canonical SS marking to occur, the protagonists would have to be different. Under the Bundling Approach, the difference in protagonist would necessitate DS marking, so non-canonical SS marking should be impossible.

However, non-canonical SS marking is widely attested, as shown in the previous section. Here is Watkins's example again, from Kiowa.

(108) Kathryn gà gút **gàu** Estheràl gà gút.
K. gʲæ- gú? gɔ E.=al gʲæ- gú?
K. [3s:3p] write.PF **and.SS** E.=too [3s:3p] write.PF
'Kathryn wrote a letter and Esther wrote one too.'

In order for the Bundling Approach to account for this, Kathryn and Esther would have to not be the protagonists of these events. It is unclear how it could be possible for the writer of a letter not to be the agent of the letter-writing. It turns out that there is something that links the two events quite firmly, as Watkins points out. In the next section, I will propose that a sentence-level situation will obviate the need for a bundling approach, and will permit the use of reference in the denotation of switch-reference.

Stirling does discuss cases of non-canonical SS marking, even in Amele (112-114). To account for these, she appeals to the nature of the event protagonist; the anti-pivot clauses have the same agent despite lacking any actual agent. As we just saw, this solution is not available for cases like (108). When exploring the Amele examples, though, it becomes clear that there is no reason to expect *a priori*

that non-canonical SS marking should involve a different mechanism from non-canonical DS marking. That is, this may well be non-canonical SS marking like the Kiowa. Looking back, we see that Stirling's separation of mechanisms for unexpected SS and DS marking only serves one purpose: It allows us to maintain the Bundling Approach. Once we bring SS and DS marking under the same mechanism, it becomes impossible to rely on Bundling, without severely weakening it.

3.2.4.5 Against a weakened Bundling Approach

One way to maintain the Bundling Approach is to weaken the Parameters of the SEI that lead to false predictions, or to weaken the concept of agreement. Perhaps the Protagonist can be some kind of topic, instead of the agent. Perhaps we could broaden our concept of spatiotemporal location. Or perhaps we could soften the conditions of switch-reference, where it *permits* SS marking if at least one Parameter matches. Each of these weakenings is problematic for a bundling approach.

The problem with weakening the Protagonist condition is that topichood is not restricted to subjects, but (canonical) switch-reference is. You would have to re-strengthen it back to exclude non-subjects. The problem with broadening location is that the use of spatiotemporal location is independently useful as it is. Positing a special version of proximity or cotemporaneity to preserve a theory of switch-reference is not helpful. And lastly, a weakened Bundling Approach removes any role for deriving pivot selection in the grammar. The only factor becomes whatever the speaker feels relevant. That is, there is no real need for a pivot selection mechanism in the grammar if the speaker can pick the pivot at will without restriction.

By itself, this last factor is not problematic for an analysis of switch-reference; indeed it would be an intriguing result. However, such a result is problematic for a

bundling approach, because the main motivators of any pivot selection are outside the SEI. If the speaker can select a particular pivot, there is no need for any SEI, because the pivot can be just about anything except the event (which can't refer). More broadly speaking, there would be no need for a theory that relates the joined clauses' events. Since the whole point of the Bundling Approach is to create a theory of switch-reference based on relating the joined clauses' events, weakening it would remove its justification.

3.2.5 Summary

The Bundling Approach is untenable. It can account for either non-canonical DS or SS marking, but not both, because the three parameters (or however many parameters there are) would have to all be in agreement. This is not a problem with Stirling's account; it's a problem for *any* account of switch-reference that tries to bundle together canonical and non-canonical switch-reference. Any complete theory of switch-reference must treat these separately in some respect.

That said, the Bundling Approach does make insightful points that advance our understanding of switch-reference.. It offers an account of non-canonical switch-reference, and does so with no small ingenuity. It demonstrates the necessity of a semantic approach, as well as the notion that eventualities play a role in switch-reference. In the upcoming section, we will explore non-canonical switch-reference in more detail, and propose a theory based on careful elicitation that accounts for cases of non-canonical switch-reference attested in the literature.

3.3 Switch-reference and topic situations

Switch-reference does not always track subjects. However, it does still seem to correlate to shift or maintenance of the 'scene'. Stirling's hypothesis meant to explain this correlation through the tracking of the joined clauses' Davidsonian

event arguments, through the bundling of some of the events' parameters. As the previous section demonstrates, any theory of switch-reference that relies on events or on bundling is crucially inadequate.

3.3.1 The proposal in brief

In the rest of this chapter, I make a proposal that relies on a different kind of semantic object. This proposal retains the simple and intuitive co-reference account, while accounting for the non-canonical effects. It includes two main hypotheses. The first is that non-canonical SR tracks the topic situations of each sentence. The second is that SR tracks situations when the connective is a coordinating conjunction.

- Hypothesis 1 : Non-canonical switch-reference indicates coreference or disjointness of topic situations of the joined clauses.

Hypothesis 1 is composed of two subhypotheses, one for each value of SR: Non-canonical SS marking indicates 'same situation', while non-canonical DS marking indicates 'different situation'.

- ***Hypothesis 1a :*** Non-canonical DS marking indicates a change of topic situation by signaling the disjointness of the joined clauses' topic situations. This mechanism derives a sense of scene shift.

- ***Hypothesis 1b :*** Non-canonical SS marking indicates a maintenance of topic situation by signaling the semantic identity of the joined clauses' topic situations. This mechanism derives a sense of scene continuity.

Also, I will build off the observed configurational difference to propose another hypothesis— the type of item tracked by switch-reference correlates to the syntactic type of clause juncture.

- **Hypothesis 2 :** The type of connective where switch-reference is found determines the type of object switch-reference tracks.

Hypothesis 2 is composed of two subhypotheses, one for each 'canonicity' of SR: 'Canonical' or subject-tracking SR occurs with subordination, and 'Non-canonical' or situation-tracking SR occurs with coordination. These subhypotheses can be expressed as biconditionals.

- ***Hypothesis 2a :*** Switch-reference occurs on coordinating conjunctions if and only if it tracks topic situations.

- ***Hypothesis 2b :*** Switch-reference occurs on subordinating connectives if and only if it tracks subjects.

The rest of this chapter will evaluate each hypothesis in turn. For each, I first show how it accounts for the observations related earlier in this chapter, and then I test it with targeted elicitation.

In section 3.1.2 we saw the repeated observation that non-canonical DS marking signals a 'scene shift' of some kind. In section 3.1.3 we saw that non-canonical SS marking signals a continuity. Hypothesis 1 explains these observations with the proposal that switch-reference is tracking the Austinian topic situation instead of the subject. That is, switch-reference isn't really 'non-canonical', but rather it is simply tracking a different kind of pivot.

3.3.2 Semantic framework

The theory of semantics that will be employed in this dissertation is a possibilistic situation semantics based on (Kratzer 1989, 2007). It is largely built on the foundation laid out in (Heim & Kratzer 1998), with the addition to the ontology of the class of objects known as situations. Under this framework, meaning is truth-conditional and compositional. The semantic structure corresponds to

the interpreted syntactic structure (LF). There are two major components to the framework; composition procedures and the organization of semantic objects into types.

3.3.2.1 Type-theoretic semantics

Semantic objects can be classified into different types that encapsulate a certain inherent property shared by every member set of objects in question. For instance, all individuals are individuals, though they can be distinguished from one another by their various properties. They can thus be placed into a type, which is called type e (for 'entities'). Another type of object in our truth-conditional semantics consists of the truth values themselves. There are only two possible truth values, true and false, here represented as 1 and 0. These truth values are of type t.

In a standard world-based semantics, there are other types of object— worlds, times, events, etc. However, this dissertation employs a situation semantics, in which situations replace worlds, times, and events.[15] Situations are of semantic type s.

The type theory does not simply describe classes of objects. It describes classes of functions as well. For instance, the property *dog* expresses a function that maps any entity it to a truth-value, mapping it to 1 if and only if that entity is a dog, and mapping it to 0 otherwise. It will take Odie, and map it to 1. It will take Garfield and map it to 0. Since *dog* takes an entity (of type e) and maps it to a truth value (of type t), it is of type $\langle e, t\rangle$, the type of properties of entities.

Type $\langle e, t\rangle$ is a complex type. But it, too, can be part of a function. For instance, the definite determiner *the* expresses a function that maps any property of entities to a specific entity. While the noun phrase *dog* refers to the set of all dogs, the

[15] This replacement is not absolutely crucial to the functioning of a situation semantics.

determiner phrase *the dog* refers to a specific canine. The function *the* is of type $\langle\langle e,t\rangle,e\rangle$.

The type theory is recursive. Recursive processes are those where the output of a process can be plugged back into the process *ad infinitum*. As far as type theory goes, any type can be combined with any other type to create a new complex type. For instance, e is a type and t is a type, so $\langle e,t\rangle$ is a type. That type can be combined with another type as well. Since $\langle e,t\rangle$ is a type and t is a type, then type $\langle\langle e,t\rangle,t\rangle$ is a type. Since $\langle e,t\rangle$ is a type and $\langle\langle e,t\rangle,t\rangle$ is a type, $\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle$ is a type. And so on. Types can be infinitely complex; it is not possible to list them all. We can thus list basic types, and define a recursive rule for the combination of types that allows for this infinite complexity.

Table 3.1. Semantic types

type	object
e	the type of entities
s	the type of situations
t	the type of truth-values

Type theory restricts composition because it defines the nature of the objects that compose. It also (indirectly) imposes restrictions on which compositional procedures can be used at a given point in the structure.

3.3.3 Situations in semantics

Situations were first proposed by Barwise & Perry (1983) as a way to restrict truth-conditions (see section 3.3.4). The framework used here is a more recent one, based on Kratzer (1989), in which situations are parts of possible worlds, and their presence in the compositional structure restricts the meaning of the composition. Effectively, this partiality allows speakers to systematically restrict the scope of their assertions. Applied to entire sentences, they allow a straightforward mech-

anism for deriving Austinian truth— the context is represented in the sentence by a situation, about which the assertion is made.

3.3.3.1 Partiality and Mereology

Partiality is an important relation in situation semantics. Thus, it is important to establish a mereology of situations. A situation is simply defined as a part of a possible world. For instance, let us consider the actual world. If we assume this world to contain all places and all times up to now, along with anything in them (let's leave the future out of it), then any situation that is part of the actual world will contain some subset of these places and times. It might even be as small as one place at one time, for instance, Montreal last weekend, or my stomach right now. It might correspond instead to an event, like the Battle of Bouvines, or Super Bowl XXVII, or even a picnic. It might even correspond to an individual, or a group of individuals.

A situation is part of a possible world, and any part of a possible world is a situation. As a result, possible worlds are defined as situations that are not part of any other situation. Hence, they are not represented separately in our semantic types. Consequently every non-world situation is part of some other situation. Since a situation is generally part of another situation, a situation generally has parts that are situations. Any two situations can be summed, and importantly, when you sum any situation with a second situation that it is a part of, the result is equivalent to the larger situation. In fact, the part relation can be defined as such— any situation s is part of another s', if and only if $s+s' = s'$. I will represent the part relation as $\leq$, so we can re-write the part-relation biconditional as follows:[16]

[16] As used in Kratzer (2007), the part relation is expressed as $\leq_p$.

For all situations s and s′:

$$(s \leq s') \leftrightarrow (s + s' = s')$$

3.3.3.2 Situations in the syntax

Situations are not only present in the interpretation of the sentences, they are actually present in the structure, and their meaning composes like any other semantic object. Since there is little to no evidence so far of overt situation pronouns[17], we have to rely on semantic evidence. One key piece of evidence is quantification over situation variables. Cresswell (1990) argued that natural languages quantify over worlds and times just like it quantifies over individuals (i.e., with operators binding variables). Percus (2000) demonstrated that possible-world variables (or variables like them) are in the syntax, and their position in the syntax affects their interpretation. Stanley & Szabó (2000), Kratzer (2004, 2007), and Martí (2006) argue specifically for quantification over situation variables.

Formally, situations are referred to in the syntax by a variable, s_n, where n is an index that links the variable to some situation via variable assignment. It is of semantic type *s*. A situation's denotation is as given in (126).

(126) For any index n and any assignment function g:

$$[\![s_n]\!]^g = g(n) : s$$

3.3.3.3 Propositions in a situation semantics

In a Kratzerian situation semantics, propositions are properties of situations, of type $\langle s, t \rangle$. Like other properties, a proposition's extension is simply the set of objects (in this case situations) for which that proposition is an adequate description. Thus, asserting *it was raining* about a situation is like asserting *it was a cocker spaniel* about an animal.

[17] Kratzer (2004) suggests that the Bavarian pronoun *da* is anaphoric to situations.

(127) $[\![\textit{it was raining}]\!] = \lambda s.$ it was raining at s : $\langle s, t \rangle$

Recall our example *it was raining*, which we assumed was true about Montreal last weekend, but not about Montreal last night. The truth of the proposition expressed by this sentence depends on which situation it is being asserted over. Let us assign the variable s_4 to the situation covering Montreal last weekend, and s_8 to the situation covering Montreal last night. In that case, the proposition *it was raining* is a good description of s_4, but not of s_8.

(128) a. It was raining (s_4) = true

b. It was raining (s_8) = false

The use of situations to effect contextual restriction has been found very useful in understanding the truth-conditions of a wide-variety of semantic phenomena, including sentence interpretation (Barwise & Perry 1983; Barwise & Etchemendy 1987), attitude ascription (Kratzer 2002), e-type anaphora (Berman 1987; Heim 1990; Elbourne 2005), as well as adverbial quantification (von Fintel 1994; Percus 2000). Situations are used in two major ways to bring about this restriction in a sentence.[18] A topic situation restricts the truth-conditions of a sentence, and

[18]One objection to the use of situation variables (or any variable) for contextual restriction is made by Recanati, who argues (Recanati 2002, 2007) for a process of pragmatic enrichment in place of situation or location variables. He claims that only a few predicates have location arguments—those like *arrive*, which require that the speaker know the location of the event. All other predicates, like *rain* or *dance*, can still be restricted in a different way. Take his example:

(1) A: Was John present at the ball?
B: Yes, he danced all night.

It is clear that B's response is restricted by *the ball*, but how so? Recanati argues that the location is added pragmatically to the truth-conditions of the phrase, within the scope of the event quantifier:

(2) $\exists e\, \exists t$ PAST (t) & TIME (t, e) & DANCING (e) & AGENT (John, e) & ALL-NIGHT (e) & LOCATION $(the-ball, e)$

However, his argument rests on two problematic assumptions. First, the location of an event is either an argument of the predicate or is supplied via pragmatic enrichment. Second, the linguistically expressed location must be associated with the predicate. ctd...

a resource situation restricts the domain of a determiner or quantifier. The next subsection discusses how topic situations work.

3.3.4 Austinian truth and topic situations

The analysis of switch-reference that this chapter presents relies on Austinian topic situations that switch-reference tracks across sentence boundaries. It is thus necessary to explain what these objects are and how their role in language relates to switch-reference. This subsection lays out what these objects are, starting with the description 'Austinian.'

3.3.4.1 Truth with respect to contexts

The road to employing situations in semantics begins with the essay "Truth" by J.L. Austin 1981. In this essay, he argues that the truth of an asserted proposition depends on the context about which it is uttered. If you assert the proposition *It rained*, that proposition will be true or false for a particular context. It does not suffice for it to have rained somewhere, at some time in the past.

Recanati's first assumption is problematic in cases where there would be an argument and the kind of restriction seen in pragmatic enrichment. For instance, if the location argument of *arrive* is saturated by the place of arrival, and the point of arrival is specified, where does the restriction come into play? Here is another ballroom example:

(3) A: Was John present at the ball?
B: Yes, but he arrived at the back door— what a faux pas!

The location of arrival is the back door (of the building housing the ball), but *the ball* is still restricting the arrival just as much as it does in (1). Presumably, *the back door* would saturate the location argument of *arrive*, leaving no need for pragmatic enrichment. Otherwise, you could pragmatically enrich *at the ball* as well (You could say it overtly: *He arrived at the ball at the back door*). But what would stop infinite pragmatic enrichment?

We can also eliminate the assumption that the location argument is directly associated with the predicate. Under the situation semantics assumed here, the location is encoded in the topic situation, which is not an argument of the predicate. This is not necessarily an argument against association with the predicate, but rather a reminder that we can get by without it. Since Recanati's first assumption is flawed, and the second is unnecessary, we should not accept the conclusions he draws from them.

This point is even clearer with negation. As Partee (1973) points out, one might say a sentence like "I didn't turn off the stove!" about a particular time, but it does not simply mean "there is no time in the past where I turned off the stove." Sentences are used to make assertions about some particular time or place.

A situation semantics derives this 'partial' truth very easily. A situation is a semantic object that corresponds to part of a possible world. Austinian truth is derived when the proposition is asserted over a situation. The term *topic situation* is used to describe the use of situations to restrict truth in this way.

Situations therefore provide a systematic means of introducing partiality into semantic denotations. For instance, if you assert that *It was raining*, you are making a claim about some part of the world, and no others. Thus, your assertion's truth-value depends on the part of the world you are talking about. For instance, imagine that it rained last weekend in Montreal, but skies were clear there last night. Given that context, if you said *It was raining*, and your topic situation corresponds to Montreal last weekend, the proposition you are asserting is true. However, if your topic situation corresponds to Montreal last night, the sentence is false.

(129) **Context:** In Montreal, it rained last weekend, but it did not rain last night.

a. It was raining (topic situation = Montreal last weekend) → TRUE

b. It was raining (topic situation = Montreal last night) → FALSE

Topic situations often correspond to spatiotemporal locations. Thus, the truth of an asserted proposition also depends on the place being talked about, not just the time. Imagine that you have uttered the sentence *It's raining*. Chances are, you are not saying that it's raining all over the world, or even the rather uninformative claim that it's raining somewhere in the world. Instead, you are only describing some particular place. For instance, Montreal.

(130) **Context:** In Montreal, it is raining, but in Toronto, it is sunny.

a. It's raining (TS = Montreal right now) → TRUE

b. It's raining (TS = Toronto right now) → FALSE

Topic situations do not always correspond to spatiotemporal locations (else we could simply call them 'locations'). For instance, you could imagine asserting *My brother sat on the couch the whole time*. This sentence could be describing a situation involving several smaller events of sitting on the couch, which took place at different times and places. For instance, imagine that you asked him to help pack your moving truck in Arizona. Instead, he sat on the couch and wouldn't help. One week later, as you unpacked in Florida, he showed up, but also sat on the couch and refused to help.

These moving events, and the concurrent couch-sittings, are obviously spatially discontiguous. However, one might claim they are in fact temporally contiguous, because the parts are linked by the week in between, thus forming a contiguous time span. However, *My brother sat on the couch the whole time* could also describe a scenario where the brother did not sit on a couch in the meantime. In fact, it is still felicitous if the brother went hiking in the woods during the week, and never even saw a couch, much less sat on one. In such a context, if we include the whole week, the proposition asserted is no longer true. The intervening week must therefore be excluded from consideration, which means that topic situations can contain temporally discontiguous parts.

(131) **Context:** My brother sat on the couch while we packed in Arizona, and while we unpacked in Florida, but not at any time in between.

a. My brother sat on the couch the whole time.
(TS = packing and unpacking) → TRUE

b. My brother sat on the couch the whole time.

(TS = packing, unpacking, and the time between) → FALSE

Intuitively, then, situations can be describing various events as well. For instance, we could say *It was rainy and windy* to talk about a football game where the weather conditions were particularly deplorable.

3.3.4.2 Contextual restriction and coherence

One of the most interesting effects of topic situations derives from their restriction of the scope of an assertion. When someone makes an assertion about some situation, the assertion does not apply to anything else. So if I assert *It was raining* about last weekend in Montreal, the truth of that proposition is only meant to be judged by the facts of last weekend in Montreal. Everything else is irrelevant to this particular truth-judgment: Whether it was raining anywhere else, or in Montreal at any other time, or any other property of Montreal last weekend (was it windy, etc.). Nothing matters but whether or not it was raining last weekend in Montreal.

Contextual restriction therefore has several effects visible throughout the semantics. For instance, topic situations help maintain coherence throughout discourse. If two speakers are discussing different situations, they might both be speaking the truth, but the conversation will not proceed properly. Imagine two people discussing their weekend. Adeline asks Jacques about the picnic they had, but Jacques answers with an assertion about the soccer game after the picnic. Because these topic situations are unspoken, this change in topic is not obvious to Adeline. So her response to Jacques is still about the picnic, and the conversation grinds to a halt.

(132)
- Adeline: Did you have a good time? (TS = the picnic)
- Jacques: No. It was raining the whole time. (TS = the game)
- Adeline: Wait a sec, it didn't rain at all! (TS = the picnic

Contextual restriction via topic situations can also explain the cancellation of lifetime effects. Lifetime effects are implications of death that arise from the use of past tense on certain predicates.

(133) a. Adeline was French. *implicates:* Adeline is dead.
(TS = her lifetime)

b. Adeline was in France. *does not implicate:* Adeline is dead.
(TS = last summer)

The assertion in (133a) is past tense, so the speaker is not speaking about the present. The topic situation corresponds to Adeline's lifetime, and since that ended in the past, we get the sense that she is dead.[19]

Note that if the topic situation doesn't correspond to the subject's lifetime, the effect does not arise. For instance, saying (133b) does not trigger a lifetime effect, because one is not expected to be in France all one's life.

Musan (1997a,b) demonstrates that contextual restriction via a variable can cancel the lifetime effect. This variable, refers to a salient context, thus restricting the scope of the assertion to that context. We can model this variable as a topic situation. Like with previous examples, whether Adeline is still French is not relevant. However, since the topic situation is restricted to this meeting, there is no sense of her being dead— her Frenchness is asserted to hold only of that moment.

(134) a. Jacques introduced me to his friends. Malik was Algerian, and
Adeline was French.

b. Adeline was French (TS = the introduction)

Another effect of contextual restriction is that speakers can even exploit the unspoken nature of topic situations to flout expectations of coherence. For instance,

[19]The effect also requires some pragmatics: If Adeline were still alive, it would be more informative to say she *is* French, because the topic situation would be larger, and up to the present.

in the following dialogue, recorded from my own experience, my wife flouts the coherence of topic situations to humorously put me in a bind. I made an assertion about an event the previous evening, and used the past tense because that particular event took place before the utterance time. My interlocutor 'interpreted' my assertion as being about a much longer situation, her entire lifespan.

(135)
- Me: You looked gorgeous. (TS = last night's party)
- Wife: What, I don't usually? (TS = her lifespan)

Intuitively, assertions (and questions) are meant to describe some restricted place, time, or event. I adopt the notion of topic situation, which is used to encompass these different concepts.

3.3.4.3 Theoretical precursors to topic situations

Topic situations also play a role in temporal semantics. Because they can refer to a part of a world before some particular time, they can be used as an argument of tense, replacing time variables. For instance, topic situations can be used in a situation semantics in place of Reichenbach (1948)'s reference time, or Klein (1994)'s topic time.

For instance, Klein (1994) outlined a theory of temporal relations in sentences that split apart tense from (viewpoint) aspect. These relations are tied to the time with respect to which the sentence is interpreted. He calls this time of evaluation the *topic time*, because it corresponds to the time the utterance is about. The grammatical category tense expresses the relation between the topic time to the time of speech, which is the *utterance time*, by precedence relations, and nothing else. Past tense indicates that the topic time precedes the utterance time; future tense, that the utterance time precedes the topic time; and present tense, that neither precedes the other (i.e., they are identical. See Table 3.2 for a summary).

Linking tense to the topic time predicts certain effects of tense to demonstrate restriction effects. Klein proposes the concept of topic time to account for the way that the time under discussion restricts the truth judgment of the sentence's asserted proposition. If I utter the sentence *The book was in Russian*, the past tense indicates that the topic time precedes now. Crucially, it also indicates that the scope of the assertion is restricted to some time before now. For instance, Klein describes the following imaginary dialogue in a courtroom:

(136) a. Lawyer: What did you see when you entered the room?

b. Witness: There was a book on the table. It was/#is in Russian.

(136b) is of particular interest, because replacing past tense *was* with present tense *is* is infelicitous, even if the proposition *The book is in Russian* is otherwise true. Klein shows that the topic time restricts the interpretation of the sentence to some particular interval, in this case corresponding to when the witness entered the room. Using present tense in this utterance, despite being true, is infelicitous *in this utterance*, because the present tense does not describe the topic time. It matters what time you're talking about. Now, it could also be the case that the book no longer exists, or its text was somehow changed into another language.[20] The sentence with past tense is still felicitous here, because past tense indicates that the topic time precedes the utterance time, independent of anything else. What we know about the world will influence whether we draw the implicature that the book is still in Russian, but the assertion itself leaves that open.

Klein's theory of time separates tense and aspect, and sets them up so that aspect takes the interpretation of the verb phrase and 'leads' it up to tense. It is not only elegant; it later turns out to fit quite snugly with the syntactic structure of the extended verbal projection. Kratzer (1998) formalizes Klein's approach (Table 3.3)

[20]Perhaps with e-books, this will be possible.

Table 3.2. Kleinian tense

Tense	relation
past	TT ≺ UT
present	TT = UT
future	UT ≺ TT

using a property of times expressing a temporal precedence relation (≺) between times. This property and relation also applies between situations. If s* is the utterance situation, past indicates that the topic situation precedes the utterance situation, present indicates overlap (future is more complicated).

Table 3.3. Tense with situations

Tense	relation
past	λs. s ≺ s* : $\langle s, t \rangle$
present	λs. s ∘ s* : $\langle s, t \rangle$

3.3.4.4 Summary

This section has introduced the key concepts of situation semantics that are relevant to this discussion. Situations are parts of possible worlds that are used in natural language to restrict the scope of truth-conditions. They are used to restrict sentences, where they are called 'topic situations', or to restrict the domain of determiners and quantifiers, where they are called 'resource situations'. The use of topic situations neatly derives the Austinian conception of 'partial' truth. Hypothesis 1 builds off this theory to claim that switch-reference can track these topic situations, accounting for non-canonical switch-reference, and deriving apparent coherence effects.

3.4 Hypothesis 1

In this subsection I apply Hypothesis 1 to one of the observations from section 3.1.2 and one from 3.1.3. It applies just as easily to the other examples from these

sections. Then, I will test the hypothesis to verify it. However, for brevity I will not discuss the previous examples further, unless doing so elucidates a particular issue.

3.4.1 Applying Hypothesis 1a

Hypothesis 1a claims that DS marking signals a change in topic situation from one conjoined clause to the next. This change derives the scene-shift effects in section 3.1.2, by indicating that the second conjunct is evaluated against a different topic situation than the first conjunct. For instance, in (137), the DS marking indicates that the first conjunct (having coffee) and the second (going home) are to be evaluated against different situations. This change in topic situation is hinted at in the English translation, which adds the adverbial *later on*.

(137) wak^{h}alapi blatke na wagli **yuk^{h}a** č^{h}ahapi ewaktuže poetušni
coffee 1-drink and.SS 1-go home and.DS sugar 1-forget buy-NEG
'I had some coffee and went home.
Later on I realized I had forgotten to buy sugar.'

SR	TS	subject	sentence
—	s_1	x_2	I_2 had some coffee
SS	s_1	x_2	I_2 went home
DS	$\mathbf{s_3}$	x_2	I_2 had forgotten to buy sugar

Table 3.4. DS marking indicating scene shift

3.4.2 Applying Hypothesis 1b

The scene continuity effects reported in section 3.1.3 are derived from the signal provided by SS marking, which indicates that the second conjunct is evaluated against the same situation as the first conjunct. Non-canonical SS marking was well exemplified in the Crow example (107) repeated here. The second SS marking in (107) occurs despite the two conjuncts having different nominal arguments.

This use highlights that the houses and people are in the same situation— the camp that the boy is looking at.

(107) chiláakshe shikáakee-sh asall-ák kuss-íkaa-lee-**m** ashé ah-**ak**
morning boy-DET go_out.SS GOAL-look-!-DS lodge many-SS
bilaxpáake chiwakálaa-k dahkú-m...
people go back and forth-SS continue-DS
'in the morning the boy went out, he looked in the direction of [the old campsite], and to his surprise, there were lots of lodges, and people going back and forth.'

SR	TS	subject	sentence
—	s_1	x_2	he_2 looked that way
DS	s_3	x_4	there were lots of $lodges_4$
SS	$\mathbf{s_3}$	x_5	$people_5$ going back and forth.

Table 3.5. SS marking indicating scene continuity

The fact that the examples from texts are compatible with Hypothesis 1 lends it great support. Nevertheless, it is merely suggestive. We need to test the hypothesis using context-driven elicitation. Building the right context requires an awareness of what would inform us about the role of topic situations. As we saw in the previous section, topic situations play a role in managing truth-conditions (129) and in maintaining coherence (132). Testing for coherence is difficult, because pragmatic interference can occur, so the ideal testing criteria are truth-conditions.

The identity of topic situations bears a strong relation to the truth-conditions of their sentences. In the same way an entity corresponds to the set of properties that apply to it, a situation corresponds to the set of propositions that hold of it. Two situations differ if there is at least one proposition that is true of one and not the other. Put another way, no two discrete situations can have the exact same

set of properties. This fact can be used to test for differences that distinguish two different topic situations.

3.4.3 Testing Hypothesis 1a

Hypothesis 1a claims that non-canonical DS marking indicates 'different topic situation'. If we want to test for situation-based DS marking, we simply need to construct examples where the two conjoined clauses must have different truth-conditions. With different truth-conditions, the propositions expressed by the clauses cannot hold of the same topic situation. Therefore, the clauses must have different topic situations.

To ensure that the non-canonical DS marking is situation-tracking, we must control for the clauses' subjects by ensuring they are co-referential. Hypothesis 1a is correct if and only if when the subjects are identical and the topic situations are different, DS marking is obligatory. It is incorrect if SS marking appears.

Prediction : If the subjects are coreferential,
and the topic situations are disjoint,
DS marking is obligatory.

The easiest way to ensure differing truth-conditions is contradiction. If each conjunct entails the other's falsehood, they cannot hold of the same topic situation, so situation-tracking SS marking should be impossible. An example of conjoined clauses with contradiction is (138).

(138) Mary brought a cake and Mary didn't bring a cake.

Unfortunately, the pragmatics make it difficult to create a context for elicitation that would force a clause to have non-canonical DS marking. An example like (138) is easy enough to produce for introspection by a native speaker trained in linguistics or well-experienced in giving semantic judgments. The hypothesis would be easy to confirm, even without providing a context, because no matter what the

context was, the topic situations would have to differ. However, with naïve speakers, a sentence like (138) can cause confusion, because contradictory statements are infelicitous.

When I conducted judgment tasks, I got negative results for SS marking. This is predicted by Hypothesis 1a, but DS marking was also rejected. It seems that the pragmatic oddity of contradiction overrode any other judgments.

(139) # Travis é bo̲ **nàu** Travis háun é bo̲mâu.

T ɛ́– bɔ́ː nɔ̃ T hɔ́n ɛ́– bɔ́-mɔ̂

T. [3s:1s] see.PF and.DS T. not [3s:1s] see.PF-NEG

'Travis saw me and Travis didn't see me.'

(140) # Travis é bo̲ **gàu** Travis háun é bo̲mâu.

On performance tasks, the speakers would change the connective to *né*, 'but' (which does not carry switch-reference), or omit the conjunction altogether. Yet, it was plain to see they didn't 'like' the examples, and they often expressed confusion. There was too much pragmatic interference to rely on examples like these. Perhaps in time, speakers with experience at making semantic judgment can easily judge and produce sentences with contradictions, but for the current study it was simply not possible.

I was able to test for differing topic situations by relying on differing events. That is, contexts where the two clauses are judged against two situations sufficiently different from one another as to be recognized as distinct. I got this idea from a speaker follow-up early on in the project. I was asking about 'canonical' (i.e. subject-tracking) switch-reference with *wh*-subjects.

Context:
You are talking with your friend about a get-together last weekend. Everyone was supposed to bring something for everyone to eat or drink. You can't remember who it was who brought the coffee and the tea. You know it was two different people, but can't remember exactly who.

(141) Hâjêl chói bấu **gàu** hâjêl chóigùl

hâːtêl tsói ∅– bɔ́ː gɔ hâːtêl tsói+gul ∅–

person\WH coffee [3s:3s] bring.PF and.SS person\WH liquid+red [3s:3s]

bấu?

bɔ́ː

bring.PF

'Who brought coffee, and who brought tea?

After getting a translation with one SR value, I would ask a judgment about the same clause with the other SR value. What was interesting is not the (expected) rejection of the DS value in this case, but the speaker comment, which suggested that context was crucial.

(142) #Hâjêl chói bấu **nàu** hâjêl chóigùl bấu?

comment: "Then it's like you're talking about two different parties."

We must first determine what kind of context would lead to considering two events as distinct situations, since there is no overt signal of any change (besides the switch-reference that we're testing for). I provided a context involving two situations of the same type, where a unique event of a certain kind takes place at each. The uniqueness triggers differing topic situations. I made the uniqueness explicit, though I suppose a researcher can rely on cultural cues if they can be certain that the speaker will be familiar with the type of event.

The task involved a production/judgment— Given a context, the speaker produces a sentence with one value of SR, and then judges a sentence with the other

against the same context. In (143), we see that with different topic situations, DS marking is obligatory despite co-referential subjects. Hypothesis 1a is confirmed.

> **Context:**
> *You are teaching a class about Kiowa culture. Each time, you make one type of food. Yesterday it was frybread, today it was boiled meat. I haven't been in your class, so I ask you what you've been making to eat.*

(143) a. Kídèl qáuèjàu ét á̲umé̲ **nàu** é̲háudèkì císàun
kʰíːdèl kʔɔ́eː-tɔ ʔéʔ– ʔɔ̃́ːm-ɛ́ː nɔ éːhɔ́ːdekʰi kí+sɔ̃n
yesterday fry bread-INV [1px:3i] eat.PF and.DS today meat+boil
é à̲umè̲.
é*– ʔɔ̃ːm-ɛ̃ː
[1px:3s] eat.PF
'Yesterday we (excl.) made fry bread and today we made boiled meat.'

b. #Kídèl qáuèjàu ét á̲umé̲ **gàu** é̲háudèkì císàun é à̲umè̲.

3.4.4 Testing Hypothesis 1b

Hypothesis 1b claims that non-canonical SS marking indicates 'same topic situation'. If we want to test for situation-based SS marking, we need to construct examples that ensure the same topic situation across the clauses, despite the subjects' reference.

Prediction : If the subjects are disjoint,
and the topic situations are coreferential,
SS marking is obligatory.

It is very difficult to ensure with absolute certainty that the topic situations are identical, because we lack any overt morphology to tell us except for switch-reference, which we are testing. However, situations are represented by pronouns, so this hurdle should be no more difficult to clear than one requiring the judgment of coreference between pronouns— overt or not— that refer to entities. In

constructing examples, I relied on ordinary properties of anaphora and pragmatic coherence to create contexts that make it as clear as possible that both clauses are using the same topic situation.

The following example employs a lead-in translation that tightly links two events by making them part of a larger event (a powwow). The subjects, *young men* and *young women*, are very distinctly disjoint. We can be confident that the topic situation is the same, because the context leads up to it, and because the subjects share a resource situation. The hypothesis predicts SS marking to be available, and DS marking to be unavailable.

> **Context:**
> *You went to a powwow recently. Your friend was supposed to come with you, but couldn't make it. The next day, you're on the phone with your friend, talking about the powwow, and she asks you what people were doing.*

(144)

Yáucáuigú	ém	gún	**gàu**	jógǘdàu	ém	dấuvàigù
yɔ́kɔ́j-gú	ʔə́m–	gə̋n	gɔ	tógú:-dɔ:	ʔə́m–	dɔ́:+pʔa:j-gu:

young women [3p:rfl] dance.PF and.SS young men [3p:rfl] sing+fight-PF

'The young women danced and the young men sang.'

The speaker response to the production task shows that SS is available and preferred, but I did not follow this example with a judgment task to ensure that DS was unavailable. This example strongly supports hypothesis 1b, but does not quite confirm it.

The following example does confirm it, because it includes a follow-up judgment:

Context:
A group of men were seated in a circle. One at a time, the men would stand up and tell a story or a joke. If two got up at the same time, one would sit back down; it is rude for two men to speak at the same time.

(145) a. Yí̃dè én kàulé̃hâ **gàu** úidè èm
jíː-de ʔén– kʰɔːlé+hâː gɔ ʔúj-de ʔẽm–
two-NOM [3d:rfl] together+get up.PF and.SS that-BAS [3s:rfl]
âuisȁugà.
ɔ̂jː+sɔː-gʲæ
again+sit down-PF
'Two men stood up together, and one of them sat back down.'

b. #Yí̃dè én kàulé̃hâ **nàu** úidè èm âuisȁugà.

In (146), I employ a follow-up context with a production task. The set-up clause (146) sets up the set of horses as the topic situation of the conjoined clauses that follow (147a).

The subjects of the two conjoined clauses must differ, since a horse cannot be both fast and slow. However, the clauses must be judged against the same topic situation. Otherwise, the reference of the DPs would be unclear, and the follow-up would be incoherent with the set-up clause. Thus, we can be certain that the clauses have the same topic situation.

Hypothesis 1b predicts that in such a context, SS marking is good, and DS marking is bad. This prediction holds. In the original response (147a), SS marking is offered. A follow-up judgment task confirms that DS marking is unavailable in that context.

(146) Úi-dè qá̱̃hì̱̃ chḛ̂gàu áu âui,
ʔúj-de kʔʲæhĩː tsȇ̃ː-gɔ ʔɔ́– ʔɔ̂jː
that-BAS man horse-INV [∅:3i:3s] plentiful
'That man has a lot of horses...'

(147) a. fá á sáui **gàu** fá á sáuibé

pá: ʔá– sɔ́j gɔ pá: ʔá– sɔ́jbé

some [3p] fast **and.SS** some [3p] slow

'some of them are fast, some of them are slow'

b. #fá á sáui **nàu** fá á sáuibé

Hypothesis 1b is confirmed. Since Hypothesis 1a was also confirmed, Hypothesis 1 is confirmed. What is called *non-canonical switch-reference* is actually situation-tracking switch-reference.

3.4.5 Ruling out alternatives

Before moving on to Hypothesis 2, I will rule out alternatives to Hypothesis 1 by examining other semantic objects (locations, events, times) that one might use to explain some of the non-canonical cases. Also, I rule out the possibility that switch-reference is tracking other arguments in the clause.

In a non-situations semantics, semantic objects like times, locations, and possible worlds provide a lot of contextual restriction. As this subsection explains, the other types of objects are neither sufficient nor necessary to account for the wide range of non-canonical switch-reference, especially those that link spatiotemporally disparate events.

In addition, the use of situations greatly simplifies an analysis of non-canonical switch-reference, because they encompass worlds, times, and locations. Without situations, we would have to claim that switch-reference tracks all sorts of objects, depending on the context. It is not clear what mechanism selects one of these objects on some occasion, but the subject on others.

3.4.5.1 Controlling for spatiotemporal location

One prediction of Hypothesis 1 is that other semantic objects, like locations or times, are not sufficient for explaining the use of non-canonical switch-reference. Oftentimes, situations do correspond to spatiotemporal locations (e.g., last night in Montreal). However, a situation is simply a part of a possible world, so they are not limited to spatiotemporal locations. Since any two situations can be summed together to make a larger situation, a situation's parts do not even have to be spatiotemporally contiguous (see section 3.3.4). If switch-reference can track situations and not just times or locations, then situations whose parts are disparate (i.e., not spatiotemporally contiguous) should be able to be tracked, showing up as non-canonical switch-reference.

Indeed, the literature contains at least one clear example where location appears not to matter. Watkins (1993) provides a very interesting example of non-canonical SS marking. In (148), two subjects are different people, yet SS-marking may be used.

(148) Kathryn gà gút **gàu** Estheràl gà gút.
K. gʲæ- gú? gɔ E.=al gʲæ- gú?
K. [3s:3p] write.PF **and.SS** E.=too [3s:3p] write.PF
'Kathryn wrote a letter and Esther wrote one too.' (Watkins, 1993)

The letter-writings took place in different locales at different times, so it would not be right to say that there is a spatiotemporally contiguous part of the world shared by the two events. Instead, Watkins reports her consultant's impression that shared purpose is what links these two letter-writings together. The non-canonical SS-marking would be used when the letters were "written for the same reason, to the same person, at about the same time." She has more recently confirmed (p.c.) that her consultant affirmed the key property is "shared purpose."

Under a situations account, we can say that the identical topic situation (s_1) is the sum of the two letter-writing situations (s_2) and (s_3), that is $s_1 = s_2 + s_3$. Perhaps the summing is made to highlight the 'shared purpose'. I should note that nothing in the situations framework requires s_2 and s_3 to be related to each other. However, von Fintel (2005) has noted that although our logical space allows any two situations to be summed, observations of natural language usage show that speakers only sum two situations if there is a coherent relation between them. Thus, we can rely on pragmatics to ensure that the relation exists, and we can use fieldwork to understand what kinds of relations are possible.

To rule out spatiotemporal locations, I tested variations of (148) with contexts that force discontiguity. Ruling out times requires switch-reference that ignores them; SS appearing despite a time difference, or DS appearing despite simultaneity. Ruling out locations requires switch-reference that ignores them; SS appearing despite a place difference, or DS appearing despite sharing the same space.

The contexts I used were inspired by follow-up comments made by more than one consultant: One possible scenario would be if Kathryn and Esther were writing the Governor to pardon a prisoner. The context that leads in to (149) involves letter-writing events that are hundreds of miles apart on different days. The production task resulted in SS marking, and a follow-up judgment affirmed that DS marking is unavailable.

> **Context:**
> *Bill is in prison for a crime he didn't commit. His supporters are sure that he is innocent, and have started a campaign to convince the governor to pardon him. As part of this campaign, last week Kathryn wrote a letter to the governor from her home in Tulsa, asking him to grant a pardon. Yesterday, Esther wrote a letter to the governor from her home in Lawton. Today, the chairman of the campaign wants to know what actions have been taken to get Bill pardoned.*

(149) a. Kathryn gà gút **gàu** Estheràl gà gút.

'Kathryn wrote a letter and (SS) Esther wrote one too.'

b. #Kathryn gà gút **nàu** Estheràl gà gút.

'Kathryn wrote a letter and (DS) Esther wrote one too.'

This example shows that spatial or temporal contiguity are not necessary for SS marking.

3.4.5.2 Controlling for arguments

One might object that the context for (149) fails to control for the addressee, which is the same for both conjuncts. Therefore, it does not definitively show that SR is tracking the topic situation. This objection is undermined by two observations. First, there is nothing in either conjunct to indicate the recipient of the letter. Recipients are marked in the verb agreement, whether an overt DP is used or not. Second, in no language is switch-reference observed to skip subjects to track another argument of the verb. Just to be sure, I conducted further tests, whose results show that the identity of the addressee doesn't matter.

In (150), a lead-in context that followed up (149), the two letters have different addressees, but SS marking is still felicitous in a similar context.

Context:
What if you are the governor, and Kathryn wrote her letter to you, and Esther wrote one to your advisor Tom?

(150) Kathryn yấ gút **gàu** Esther Tom gà gút.
K. [3s:3p:1s] write.PF **and.SS** E T [any:3p:3p] write.PF
'Kathryn wrote me a letter and Esther wrote one to Tom.' (f.n.)

3.4.6 Situations and plans

The claim that switch-reference can track summed disparate events as topic situations gains further support by the situations literature. Poesio (1993) shows that plans are situations by using them as resource situations to restrict uniqueness

operators in definite descriptions that refer to items identifiable only by their role in the plan.

In 151, speaker A refers to 'the truck', but doesn't need to know what truck it will be, or even whether it exists in the actual world (maybe it needs to be built first). Yet, it is referred to as unique, and carries the existential presupposition that comes with *the*, because it is unique in the plan.

(151) (Based on Poesio 1993:5)

A: We have to ship a ton of bananas from Los Angeles to Fresno by Tuesday, but our delivery people are on strike.

B: No problem. We'll get **a truck**, drive it to LA, load up a ton of bananas, and hurry up to Fresno.

A: Yeah, but who's gonna drive **the truck**?

When I asked one consultant about the letter-writing example (148) and the role of shared purpose, she offered her impression that it was like Kathryn and Esther were planning something. Then she offered an example (152a), with non-canonical SS marking, saying it would be fine if you were making a plan. I asked a follow-up judgment about DS marking in that context. It would not be fine for that context, but would be fine if you're simply saying what's going to happen. Other consultants made similar judgments.

(152) a. À tháumchànthầu **gìgáu** náucòm

ʔa– tʔɔ̃́m+tsãn-tʔɔː gigɔ́ nɔ̃́+kõm ∅–

[1s] first+arrive.PF-MOD **and.SS**:then me+friend [3s]

yáugútchànthầu **gìgáu** ájậudè

jɔ́gúʔ+tsãn-tʔɔː gigɔ́ ʔá+tɔ̃ː+de ∅–

second+arrive.PF-MOD **and.SS**:then his+male's.sister+his [3s]

hônchànthầu

hô̂ːʷn+tsãn-tʔɔː

last+arrive.PF-MOD

'I'll get there first and then my friend will get there next and then his sister will get there last.'

b. À tháumchànthầu **nègáu** náucòm

ʔa– tʔɔ̃́m+tsãn-tʔɔː nẽgɔ́ nɔ̃́+kõm ∅–

[1s] first+arrive.PF-MOD **and.DS**:then me+friend [3s]

yáugútchànthầu **nègáu** ájậudè

jɔ́gúʔ+tsãn-tʔɔː nẽgɔ́ ʔá+tɔ̃ː+de ∅–

second+arrive.PF-MOD **and.DS**:then his+male's.sister+his [3s]

hônchànthầu

hô̂ːʷn+tsãn-tʔɔː

last+arrive.PF-MOD

'I'll get there first and then my friend will get there next and then his sister will get there last.'

A possible objection to the analysis of (152a) involving topic situations is that the predicates are the same. Since the conjuncts all involve the verb *chán* ([tsɑ̃́n]),

'arrive,'[21] this might be evidence that switch-reference is sensitive to predicates. To verify the fact that plans are crucial to switch-reference, I attempted to elicit examples like (153), where the events are of distinct predicates, and take place in different locations. (153) was perfectly acceptable in a plan-making scenario.[22]

(153) Carnegiecà à thấuthầu **gàu** ám Normancù mà báthầu.
C.-kʲæ ʔa– tʔɔ́ː-tʔɔː gɔ ʔấm N.-ku mã– báː-tʔɔː
Carnegie-at [1s]= stay..PF-MOD **and.SS** you Norman-to [2d]= go..PF-MOD
'I will stay in Carnegie and you two will go to Norman.'

Besides simple plans, Jonathan Bennett 1988 (as reported in von Fintel (2005)) argues that events like multi-day conferences can be held together by coherence, not spatio-temporal contiguity. Again, definite descriptions diagnose this. Take the expression 'the winner'. This denotes the unique person winning a certain event (The unique winner in s). The event need not be spatio-temporally contiguous. To take a real-life example: In February 2007, a soccer match between Sevilla and Real Betis of Spain was halted when a Betis fan threw a bottle that hit the Sevilla coach in the head, rendering him unconscious. The last thirty minutes were re-scheduled for March, and eventually took place— after both teams played other matches. Also, it wasn't held in the original stadium, but in the distant city of Getafe. No one scored in the second part of the match, but Sevilla was leading after the first part. Therefore, Sevilla can be and has been rightfully called 'the winner' in s, where s is this non-contiguous match. Imagine they used the same ball in both parts of the match, and this ball later disappeared. When talking

[21] The predicates all involve incorporated ordinal adverbials; it does not seem like these form new lexical items, but that has not been verified.

[22] Note that the use of an overt subject pronoun (*ám*) in the second conjunct indicates contrastive focus, independent of switch-reference.

about the match one day, you could easily say *The game ball (in s) disappeared (in s')*.

Another example of relational coherence, albeit a grim one, involves a scenario where different resource situations lead to different meanings for the same surface string. Imagine a conversation between an officer and a subordinate infantryman, during a pause in battle. The infantryman tells the officer "Everyone's dead." Depending on how the situation is delimited, the contextual domain restriction can lead to two completely different propositions.

Two divergent scenarios demonstrate this. The first involves spatiotemporal delimiting. The two soldiers come across a bunker and look inside. The scene is one of unspeakable carnage. The infantryman says "Everyone's dead," referring to those whose remains lie in the bunker. The bunker at that time provides the contextual restriction: $\forall$x. person(x) in s, where s = *the bunker at that time*.

The other scenario involves some other kind of coherence. Here, the whole platoon has been slowly wiped out over weeks of fighting across the entire theater of war. All that remains are these two poor fellows. The officer, in a moment of folly, orders the infantryman to wake the others up to break camp. The infantryman replies "Sir, everyone's dead." The contextual restriction here cannot be spatio-temporal, because not only are those who have died not present, but their deaths took place in no spatio-temporally contiguous or homogenous zone. The contextual restriction is the platoon; the platoon (or at least the sum of its members) is thus a situation.[23] This example shows us three points: That the range of

[23]One might object that the infantryman meant "Everyone (you expect to be) in the present situation is dead", but I find that objection hard to swallow. It would require the conversation to be about the people as they are in the mind of the officer, but the proposition is about *everyone* as they are in the actual world. An interesting related point is made by McConnell-Ginet (2005). After a party you can say about the party "not everybody came," where the situation seems to be bigger than the party itself, because the set of invitees is in this case a superset of the set of attendees. Another interesting example would be someone who is meeting up with people at a restaurant. She gets there, but only one other friend has arrived. She could quite felicitously ask "Where is everyone?"

utterance meaning varies enormously based on resource situations, that resource situations do not need to be spatio-temporally contiguous, and that non-events can be situations.

In short, situations need not be spatio-temporally contiguous parts of a possible world, no matter how they are used: as a topic, event, or resource situation. Indeed, under the idea that individuals are situations (Kratzer 1989), we should also expect individuals to have parts that are not spatio-temporally contiguous. Parts of situations may be linked by relations that merit further investigation, but which include plans, events, and collectivities of like entities (teams, platoons). Alternately, we could say that all situations can be linked by relations of coherence, which include spatial and temporal coherence. Hypothesis 1 ought to serve as a starting point for in future research of the limit of non-contiguity. How far apart can two situations be and still be part of a larger situation held fast by coherence? There should be no logical restriction on joining different situations, but certainly there would be pragmatic ones, and these may be testable in some way.

3.4.7 A step back from canonicity

To close discussion of Hypothesis 1, let's examine a terminological consequence of no small importance. The term *non-canonical switch-reference* describes the use of switch-reference that appears to ignore subject co-reference. This led some researchers to question any role for co-reference. However, we have seen that these uses are explained by co-referentiality of a particular argument in the sentence besides the subject. That is to say, there is no such thing as non-canonical switch-reference, only non-canonical pivots.

Setting aside the ironic use of the universal quantifier, the restriction is still interesting: The people need not be related by any place or time, but at least by some relational coherence (maybe being invited). Perhaps a mix of all three.

Therefore, from now on, I will employ the term *non-canonical* (NCSR) only to describe observed tokens of switch-reference that seem to ignore subjects, when not making a claim about its underlying cause. I will use the term *situation-tracking* (Sit-SR) to describe the actual type of switch-reference morpheme that is proposed. According to Hypothesis 1, Sit-SR accounts for NCSR.

I will use *canonical* switch-reference (SR) in referring to observed tokens of switch-reference that seem to track subjects, when not making a claim about its underlying cause. I will use the term *subject-tracking* (Subj-SR) to describe the actual type of switch-reference morpheme proposed.

This shift in terminology is important because it benefits us in two ways. First, it prevents confusion between the observations made in the literature and the proposal made in this dissertation. Second, it allows for the notion that non-canonical SR and situation-tracking SR are not necessarily in a one-to-one relationship.

3.4.8 A crucial nonambiguity

Earlier, in section 3.1.5, I pointed out that switch-reference canonicity is not always obvious. In terms of Hypothesis 1, it is not always evident from a sentence in isolation whether switch-reference is tracking subjects or topic situations. Here is the example I used:

(109) Dè hâ **gàu** à tép.
de– hâ gɔ ʔa– t^{h}ép
[1s:rfl] stand up.PF and.SS [1s] exit.PF
'I stood up and I left.'

I implied that sentences like 109 are ambiguous because it could be canonical or non-canonical. That is, it could be Sit-SR or Subj-SR. However, there isn't really an ambiguity. In any context, consultants allowed one and not the other.

Furthermore, we saw that in every case, the situation-tracking was preferred to the subject-tracking. We can generalize this observation.

> **Generalization about situation-tracking SR**: In every case where we expect sit-SR to appear, it does.

Put another way, if switch-reference can track situations, it does. This generalization leads us to an interesting conclusion about switch-reference on coordination combining two matrix clauses. All matrix clauses have a referential topic situation. Thus, switch-reference on sentential coordination should always be situation-tracking. If it is ever subject-tracking, some structure must exist to make the topic situation invisible. However, no such structure is known to exist, and there is no other evidence to propose one. As a result, we can conclude that switch-reference with coordination is always situation-tracking, whether it appears canonical or non-canonical. This conclusion leads us to the second hypothesis of this chapter.

3.5 Hypothesis 2

Hypothesis 2 proposes a link between the type of sentential connective switch-reference is found on and the type of the pivot it tracks. It consists of two sub-hypotheses, one for coordinating conjunctions and one for subordinating connectives.

Hypothesis 2: The type of clause juncture where switch-reference is found determines the type of switch-reference pivot tracked.

- Hypothesis 2a: Switch-reference on coordinating conjunctions only tracks topic situations
- Hypothesis 2b: Switch-reference on subordinating connectives only tracks subjects

At the end of the previous subsection, I logicked my way to Hypothesis 2, but empirical tests are required to demonstrate it with certainty.

3.5.1 Testing Hypothesis 2a

Hypothesis 2a claims that switch-reference with coordination tracks topic situations and not subjects. We know from the previous section that tracking topic situations is possible, so to confirm this hypothesis we need to rule out subject-tracking. We also saw that switch-reference does not track other semantic objects– it tracks either topic situations or subjects.

The strongest way to confirm Hypothesis 2a is a reduction argument against the possibility of subject-tracking. I will form a straw-man hypothesis and demonstrate its impossibility. This hypothesis I will dub Hypothesis X:

Hypothesis X :

Switch-reference on coordinating conjunctions can track subjects.

What's crucial about Hypothesis X is that if it is true, Hypothesis 2a must be false, and if it is false, the second Hypothesis 2a must be true. If Hypothesis X holds, we should find examples with co-referent subjects and different topic situations, where SS marking is obligatory and DS marking is infelicitous.

The thing is, we've already run this test — these are same conditions we used to test Hypothesis 1a! There, we were testing for situation-tracking DS marking, and we found it occurring every time. Here is another example, as a reminder.

Context:
Your friend sees a group of young men at a fair, but doesn't recognize them. She asks you what they have been doing in the events.

(154) Kídêl jógǔdàu ét gúnhêl **nàu** é̱hấudèkì ét
k^{h}ídêl tógu:-dɔ ʔéʔ– gű́n-hêl nɔ̃ é̱́:hɔ:dek^{h}i ʔéʔ–
yesterday young man-INV [3i:rfl] dance.PF-EVID and.DS today [3i:rfl]
dấuvàidèhèl.
dɔ̃́+pʾaj-de-hel
sing+fight-PF-EVID
' The young men danced yesterday, and they sang today.' (f.n.)

(155) (with SS marking) #Kídêl jógǔdàu ét gún **gàu** é̱hấudèkì ét dấuvàidèhèl.

To test for subject-tracking DS marking, we need examples with disjoint subjects and identical topic situations, where DS marking is obligatory and SS marking is infelicitous.

We have already run this test as well— these are the same conditions we used to test Hypothesis 1b. There, we were testing for situation-tracking SS marking, and we found it occurring every time. Here is another example, as a reminder.

Context:
Someone asks you Hágá ché̱gàu è tôyà?, "Where are the horses?", you reply:

(156) a. Fấ són gà fấuyàu **gàu** fấ tố gà tômầu.
pá: ső́n gʲæ– pɔ́-jɔ gɔ fá: t^{h}ó: gʲæ– tô̰:-mɔ̃:
some grass [3p:3s] eat-IMPF **and.SS** some water [3p:3s] drink-IMPF
'Some are eating grass and some are drinking water.'

b. (with DS marking) #Fấ són gà fấuyàu **nàu** fấ tố gà tômầu.

Neither prediction of Hypothesis X holds, and neither could possibly hold, because we saw that whenever situation-tracking could occur, it does. Hypothesis X is falsified, confirming Hypothesis 2a.

3.5.2 Testing Hypothesis 2b

Hypothesis 2b claims that switch-reference with subordinating connectives tracks subjects, not topic situations. We saw in Chapter 2 that it can track subjects, so to confirm this hypothesis we need to rule out situation-tracking. We also saw that switch-reference can only track subjects, (technically, the highest nominal argument), not any argument below them.

A simple attempt to test Hypothesis 2b is to look for non-canonical switch-reference with subordination. Since, by Hypothesis 1, any example of non-canonical SR is situation-tracking, finding it here would falsify Hypothesis 2b.

I found early on that non-canonical SR in subordination is unavailable in simple elicitation. Given a translation task, the speakers would invariably use canonical SR (157a). For the follow-up judgment task, the speakers would swiftly and strongly reject non-canonical SR (157b).

(157) 'When Kathryn wrote a letter, Esther wrote one, too.'

a.

Kathryn	gà	gút**è̱**	Estheràl	gà	gút
K.	gʲæ–	gúʔ=ẽː	E.=al	gʲæ–	gúʔ
K.	[3s:3p]	write.PF=when.DS	E.=also	[3s:3p]	write.PF

b.

*Kathryn	gà	gút**chè̱**	Estheràl	gà	gút
K.	gʲæ–	gúʔ=tsẽː	E.=al	gʲæ–	gúʔ
K.	[3s:3p]	write.PF=when.SS	E.=also	[3s:3p]	write.PF

With coordination, speakers would generally accept the non-canonical follow-up in these contextless environments, though sometimes with hesitation. What we've seen suggests that context plays a role in SR with coordination, but not with subordination. Still, we want to test Hypothesis 2b, and the best way to be certain is a reduction argument. The hypothesis used for this case I will dub Hypothesis Y. Crucially, if Hypothesis Y is true, Hypothesis 2b is false, and if it is false, Hypothesis 2b is true.

Hypothesis Y :

Switch-reference on subordinating connectives can track topic situations.

The test conditions for situation-tracking SS are clauses with disjoint subjects and coreferent topic situations, where SS marking is obligatory and DS marking is infelicitous. These conditions are not quite possible, however, because the topic situations in a *when*-clause must differ from that of its matrix clause. Yet, although the topic situations must differ they are still related, at least by matching (Rothstein 1995). Thus, we can create contexts where the link between the situations is tight, perhaps tight enough to lead to an SS marking.

In (158), the context describes a scenario where two actions are tightly linked, and the subjects differ.[24] As predicted, DS marking is obligatory.

Context:
A group of men were seated in a circle. One at a time, the men would stand up and tell a story or a joke. Imagine there is a rule where if two men stand up, one has to sit down. A friend has asked you about this rule, and you are explaining it to her.

(158) Yı́dè én kàulḗhâjȁu**ȅ̱**, hágá èm

jíː-de ʔén– kʰɔːlé+hâː-tɔː=ẽː hágʲǽ ʔẽm–

two-NOM [3d:rfl] together+get up.PF-MOD=when.DS time\INDEF [3s:rfl]

âuisȁujȁu.

ɔ̂jː+sɔː-tɔː

again+sit down.PF-MOD

'If two men stand up, one has to sit back down.'[25]

(159) #Yı́dè én kàulḗhâjȁu**chȅ̱**, hágá èm âuisȁujȁu.

'If two men stand up (SS), one has to sit back down.'

[24]One subject referent includes the other; in Kiowa inclusion is canonically DS marked.

The test conditions for situation-tracking DS are clauses with coreferent subjects and disjoint topic situations, where DS marking is obligatory and SS marking is infelicitous. As noted before, the topic situations of the *when*-clause must differ, though they are still related. Nevertheless, SS marking is required, as the production-then-judgment task in (160) shows.

(160) a. Travis Carnegiecà thấu**chē**, hàun Énédấukòcà dấumâu.

T. C.-kʲæ ∅– tʔɔ́ː=tsẽː hɔ̃́n énédɔːko-kʲæ ∅– dɔ́ː-mɔ̃̂ː

T. C-in [3s] stay=when.SS not A.-in [3s] be-NEG

'When Travis stays in Carnegie, he isn't in Anadarko.'

b. Travis Carnegiecà thấu**ē**, hàun Énédấukòcà dấumâu.

'When Travis stays in Carnegie (DS), he isn't in Anadarko.'

Neither prediction of Hypothesis Y holds; it is therefore falsified, confirming Hypothesis 2b. Since we have confirmed Hypothesis 2a and Hypothesis 2b, we have confirmed Hypothesis 2.

3.5.3 Summary of findings

To summarize the findings of this chapter: The phenomenon described as 'non-canonical switch-reference' is explained by the ordinary tracking of the reference of the topic situations of the joined clauses, rather than their subjects. Situation-tracking is not limited to obviously non-canonical examples, but instead occurs whenever switch-reference appears with coordinating conjunctions. On the other hand, subject-tracking remains for subordinating switch-reference. That is, configuration type determines pivot type.

I am confident that Hypothesis 1 and 2a apply cross-linguistically, but Hypothesis 2b requires further investigation. The apparent lack of any clear cases of sub-

[25]The target contains 'if', but as in English, the use of 'when' (=*chē/ē*) with a conditional sense is common in Kiowa, and the sessions where I elicited these examples revolved around =*chē/ē*.

ordinating switch-reference tracking situations suggests that Hypothesis 2b might apply well beyond Kiowa. However, subordinating switch-reference in Kiowa occurs only with intensional adverbial clauses; other clause types lack switch-reference. In other languages, these other types would have to be tested in the course of future investigations.

3.6 Apparent subject-tracking

The confirmation of Hypothesis 2 has an important consequence: Canonical switch-reference is not always subject-tracking. Any apparent subject-tracking may be coincidental. However, apparent subject-tracking is so common that we should not leave it unexplained. We must understand why coordinating switch-reference seems to track subjects so often if it always tracks topic situations.

The answer to this question lies in the observation that topic situations are often tied to subjects through domain restriction. Apparent subject-tracking in switch-reference arises when two factors converge. First, the subject's resource situation is tied to the clause's topic situation, and second, the subject's resource situation is co-extensive with the DP.

3.6.1 Co-extensive domain restriction

Subjects, like any DP, contain a resource situation pronoun that restricts the interpretation of its determiner or quantifier. This pronoun can be anaphoric to a situation, or tied via binding to the clauses' topic situation.[26] For instance, in (161), B's reply is made about the party (here, situation s_1), and its topic situation is s_1. The subject's resource situation is also the s_1, giving 'everyone at the party had a good time at the party.'

[26]Schwarz (2009) proposes a mechanism to effect this tying by an operator (Σ), based on an idea by Büring (2004), that binds the resource situation and calls for the topic situation. The exact mechanism need not concern us here.

(161) A: How was the party?

B: (s_1) [Everyone (s_1) had a good time.]

Sometimes, a domain restricting situation co-extends to the individual or set of indivduals being picked out by the quantifier or determiner. For instance, let's think back to this party. At the party, A gives B a list of people to introduce themself to: C,D,E,F, and G. An hour later, A checks in on how B is doing with the list.

(162) B: I managed to meet everyone.

Depending on the resource situation, (162) can mean many things. But here, it is the group of people on the list. Let us call this group the situation s_2. Since s_2 is C,D,E,F, and G, and 'everyone in s_2' is C, D, E, F, and G, the situation and the DP are co-extensive.

Co-extension works with referential DPs as well. Elbourne (2005) demonstrates that even proper names are equivalent to definite descriptions. That is, the name *Travis* means 'the Travis'. Definite descriptions come with domain restricting situations, and this can be co-extensive with the individual. That is, *Travis* can often mean something like 'the guy named Travis in the Travis situation'.

(163) $[\![\text{Travis}]\!] = \iota x.\ \text{Travis}(x)(s_2)$, where s_2 = Travis

This notion might seem counter-intuitive at first, but it is quite reasonable. For one thing, individuals are in the set of situations Kratzer (1989), so the notion of a Travis situation should not be far-fetched.[27] For another, a co-extensive situation

[27]Granted, the difficulty in envisaging just what something like a 'Travis situation' is has led many to consider the notion of individual situations far-fetched. But if a situation is a part of a possible world, and any individual is part of a possible world, any individual must be a situation. It might not be absolutely possible to say with certainty what parts of an individual count and what don't, but the same can be said about entities, locations, events, times, or any other semantic object. That is to say, a little blurriness is a feature of natural language, not a bug, as frustrating as it is for those who try to formalize it.

is the most informative domain restriction possible, and it ensures a unique referent with the property described. Also, the use of a co-extensive resource situation requires the listener to be familiar with that situation, reinforcing the presupposition of a definite determiner.

3.6.2 Co-extension and apparent subject-tracking

Switch-reference can appear canonical when it is tracking a topic situation tied to (i.e., corefers with) the subject's resource situation, and that situation is co-extensive with the subject. In (164), the subjects differ in reference, so the canonical DS marking seems to be subject-tracking. However, according to Hypothesis 2, this is situation tracking.

(164) John came in and-DS Bill sat down.

What I propose is that switch-reference is tracking a topic situation that co-refers to a co-extensive subject domain restrictor. The paraphrase of the name *John* in (164) is 'the unique individual in s_1 whose name is John' The paraphrase of the name *Bill* in (164) is 'the unique individual in s_2 whose name is Bill. Since the 'John situation' (s_1) is disjoint from the 'Bill situation' (s_2) DS marking appears. The fact that these descriptions end up referring to different people is coincidental.

(165) s_1 [[John (s_1)] came in] and-DS s_2 [[Bill (s_2)] sat down.]

Under this account, what appears to be subject-tracking with coordination is in fact tracking of a co-extensive resource situation. Canonical switch-reference appears to be subject-tracking so often because we generally refer to people we know by name by using their co-extensive resource situation, which is the most informative. Exceptions occur when some other situation is more salient, and the individual's role in that situation is a more pertinent or reliable identification method than simply using a co-extensive situation.

3.6.3 Co-extensive resource situations in narration

In narratives, switch-reference usually seems to indicate a change in subject within a single episode. This effect is most marked in long stretches of sentences with pro-drop subjects, where only switch-reference lets the listener understand who's doing what without relying on context.

The following example illustrates this, though it isn't so long. It is an excerpt from a narrative describing the aftermath of the Kiowa raid on a wagon train, where federal marshals were rounding up Kiowa leaders, including Big Tree. Each clause has a different subject, and DS marking appears with each switch-reference marker.

(166) **Nègáu** áuphầu hấféhèl **nàu** èm
and.DS:then toward(the store) [3s?] charge:PF.EVID and:DS [3s:REFL]
càuétkùlhèl —Ấdàuiét— **nègáui**[28] àlhèl áuphầu
fear:flee:PF.EVID -Big Tree- and.DS:then:[3i:3s] chase.PF:EVID that way
ấdò̲m
woods:under
'And then they charged at it and he fled in fear, Big Tree. And then they chased him that way into the woods'

If topic situations corresponded solely to episodes (Lungstrum 1995), we would expect SS marking within long strings like (166) no matter what the subject. We can drop that notion, of course. But even if topic situations do not correspond to the episodes of the narrative (not exclusively, at least), they can still correspond to situations co-extensive to the subjects of the clauses.

This correspondence suggests that speakers use topic situations differently in narration than in conversation. This suggestion is not altogether surprising; in

[28] *Nègáui* is a fluent-speech contraction of *nàu hègáu è=*, 'and.DS then [3i:3s]'.

conversation, topic situations have a relationship to the question under discussion, but in narration, there is rarely such a question. Thus, when it is clear that the episode is being maintained, co-extensive topic situations can be used to emphasize the change in 'camera angle' from one story participant to the next.

3.7 Conclusion

In this chapter, I have discussed and proposed an explanation for the phenomenon known as non-canonical switch-reference. Switch-reference in these cases is tracking the joined clauses' topic situations, rather than their subjects. Otherwise it seems to behave normally. Furthermore, the testing used to verify this proposal leads to another: All switch-reference on coordinating conjunctions tracks topic situations rather than subjects.

This account provides an account for the phenomenon, where effects related to coherence are derived from the object of reference-tracking. It rests upon a semantic object whose existence has been thoroughly and independently demonstrated in the semantics literature.

A welcome consequence of this proposal is that it informs us about topic situations as well. It provides the first clear evidence of morphology reflecting topic situation reference, and offers a reliable way of testing for topic situations, at least in languages with switch-reference.

CHAPTER 4

A THEORY OF SWITCH-REFERENCE

The previous two chapters expanded our understanding of switch-reference, as well as ruled out the two major theories previously proposed to account for it. This chapter will propose a new theory. Section 4.1 will outline the facts and lay the theoretical groundwork for the proposal.

4.1 Preliminaries

This section will summarize the facts that need to be accounted for, the components of a theory of switch-reference, and the theoretical assumptions that form the foundation of the proposal.

4.1.1 Generalizations

Any theory of switch-reference must account for the generalizations that I have compiled over the previous two chapters.

1. SR morphemes are introduced by a specific functional head in the extended verbal projection.

2. SR morphology is found at clause junctures, always in the clause with the connective, and only once per clause.

3. SR morphemes are not cross-linguistically restricted by type of clause connective.

4. Switch-reference tracks topic situations with coordinating conjunctions.

5. Switch-reference tracks subjects with subordinating connectives.

The theory presented in this chapter will account for the first pair of facts by the placement of switch-reference in the syntactic structure. It will account for facts four and five through the interaction of the SR-introducing head with the semantics of clauses. The third fact is derived lexically.

4.1.2 Desiderata

Any theory of switch-reference has four basic components or *desiderata*. In this subsection, I will summarize their major questions they raise and how I propose to account for them. I present them here one by one, but in this chapter they will be discussed out of order, since the exposition will follow the derivational structure.

4.1.2.1 The nature of the SR morpheme

What kind of object is the SR morpheme? What syntactic category is it in? What is its semantics? How do these predict its distribution? This question has already been addressed to some extent, though not completely.

I propose that the SR morpheme is a pronominal, introduced by a functional head (SR°) in the extended verbal projection. It sits above inflectional heads and below (other) complementizer heads, and introduces a relation of identity or disjointness between two arguments, its pronominal one, which it introduces, and another one, which it calls for.

4.1.2.2 Pivot selection

How does the SR morpheme select its pivot? How can we derive the pivot type (situation or subject) and the configurational effect?

The SR° head selects its pivot indirectly. It bears an unvalued index feature that is valued by the highest index beneath it. This results in a λ-abstraction such that

SR° binds that index variable and results in a property. The pivot can be defined as the object that saturates the property created by binding at SR°.

4.1.2.3 Anti-pivot selection

How does the SR morpheme select its anti-pivot?

SR bears an index feature which gets interpreted as a pronoun in the SR relation. The C° head has an unvalued SR feature that gets valued by the SR feature on SR°. This valuation requires co-indexation, so the C° binds the pronoun at SR°. This creates a property that adjoins to the dominant clause. The anti-pivot can be defined as the object that saturates the property created by binding at C°.

4.1.2.4 Anaphoric relation

What kind of relation links the pivot and anti-pivot? How can we derive a reading of co-reference or disjointness?

My proposal is that the relation is encoded in the meaning of SR. This avoids the problems of relying on the Binding Theory to do the work, and allows for an account of some purported cases of cross-linguistic variation in switch-reference systems.

4.1.3 Theoretical Foundations

I assume a common syntactic theory following the Minimalist Program (Chomsky 1995, 2001), and a possibilistic situations semantics along the lines of (Kratzer 1989, 2007), which I discuss in section 3.3.3. Any relevant details, changes, or developments will be discussed when they are necessary.

The theory of switch-reference I will propose depends on three major components of the grammar, from whose interactions the effects of switch-reference emerge. Feature valuation, binding, and $\overline{\text{A}}$-semantics I will discuss each of these in turn, and they will lead to the theory presented in the two subsequent sections.

4.1.3.1 Features in syntax and semantics

Syntactic features and their interpretation play a major role in this proposal, so it is important to lay out the syntactic and semantic properties of features that will underpin this proposal.

I adopt Pesetsky & Torrego (2007)'s conclusion that the interpretability of syntactic features is independent of their valuation, contra Chomsky (1995, 2001). Unvalued features, once valued, can be interpretable. I also adopt their use of feature sharing as the result of an Agree operation.[1] When a goal feature values a probe feature on another head, both heads end up with the goal feature.

Agree (feature sharing version) Pesetsky & Torrego (2007)

(i) An unvalued feature F (a *probe*) on a head H at syntactic location α (F_α) scans its c-command domain for another instance of F (a *goal*) at location β (F_β) with which to agree.

(ii) Replace F_α with F_β so that the same feature is present in both locations.

The final assumption that I make concerning features is that indices are represented in the syntax by index features, rather than by some independent index-assigning mechanism. The use of feature indices has proven directly or indirectly useful in several accounts (Kratzer 2004, 2009; Adger & Ramchand 2005). Notably, it allows for constraints on co-reference and binding to be recast in terms of already well-established locality constraints on Agree. Also, it further cements the link between the syntax and the semantics, because these index features are interpreted with the same mechanism as other features.

[1] Kratzer (2009), whose binding model I employ here, employs a feature unification model, which is somewhat stronger. It seems to work just as well for switch-reference as feature sharing does, but since feature sharing is more widely accepted, I will employ that to minimize potentially contentious assumptions.

In the semantics, these index features are interpreted like indices already are. Heim & Kratzer (1998) demonstrate that indices are interpreted either as variables or as variable binders. As variables, they can be semantically bound, or unbound. If unbound, their interpretation depends on the assignment function, as shown by the Pronouns and Traces Rule (167). As binders, they denote λ-operators that bind variables. Since we will focus on entities and situations, I provide the interpretation rule for each.

(167) Pronouns and Traces Rule (Heim & Kratzer 1998), adapted for situations.

For any assignment g and index feature [n]...

$[\![x_{[n]}]\!]^g = g(n) : e$

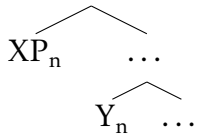
$[\![s_{[n]}]\!]^g = g(n) : s$

4.1.3.2 The binding mechanism

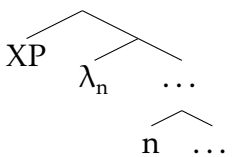
The account I propose here relies on binding, but not the Binding Theory itself. Instead, it relies on a mechanism for binding that links syntactic binding with semantic binding. Syntactic binding occurs when two constituents are co-indexed, and one c-commands the other. In that case, the dominant constituent is the antecedent of the lower one (168a). Semantic binding occurs when an index is bound by an operator adjoined to the sister of the antecedent, and interpreted with respect to it rather than the assignment function (168b). Crucially, the two are related. Heim & Kratzer (1998) show that every instance of semantic binding corresponds to an instance of syntactic binding, and *vice versa*.

(168) Correspondence between syntactic and semantic binding (for any index n).

a.



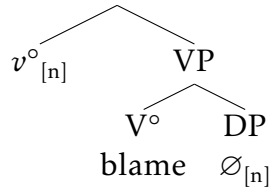
b.



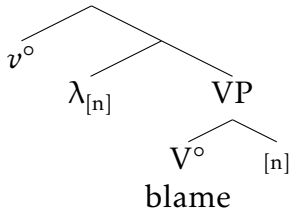
Another important aspect of the binding mechanism is the source of the binder. Recently, it has been shown that the binders are not (necessarily) the antecedents themselves, but the functional heads that call for them (Adger & Ramchand 2005; Kratzer 2009). Semantic binders correspond to functional heads, and since semantic binding corresponds to syntactic binding, the true source of syntactic binding is the functional head.

The binding mechanism proposed by Kratzer (2009) derives binding rather simply. In a sentence like *I blame myself*, the reflexive object is bound not by the subject John, but by $v°$. The object is a minimal pronoun, which comes with no ϕ-features of its own, only an index feature. The $v°$ head is co-indexed with it. This creates a binding structure (169a), so the head is interpreted as a λ-operator. This operator is adjoined to the complement of $v°$ at LF (169b).

(169) a.



b.

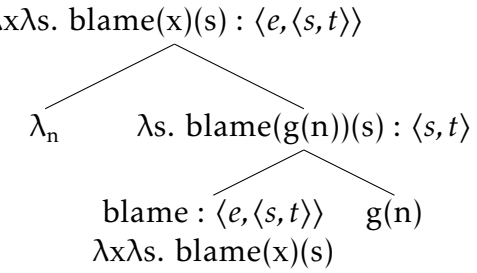


This has an effect on the semantics of the VP. The result is a relation between entities and event situations (171).[2] This relation combines with the relation introduced by $v°$ via Predicate Conjunction. Thus, the agent will also be the object when it is merged in [Spec, *v*P] (172a), and composed by Functional Application (172b).

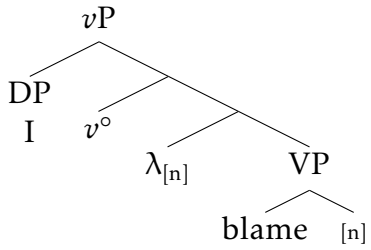
(170) $[\![v°]\!] = \lambda x \lambda s.\ \text{agent}(x)(s) : \langle e, \langle s, t \rangle \rangle$

[2]I use the term **event situation** to describe situations that are used as Davidsonian arguments to verbal predicates.

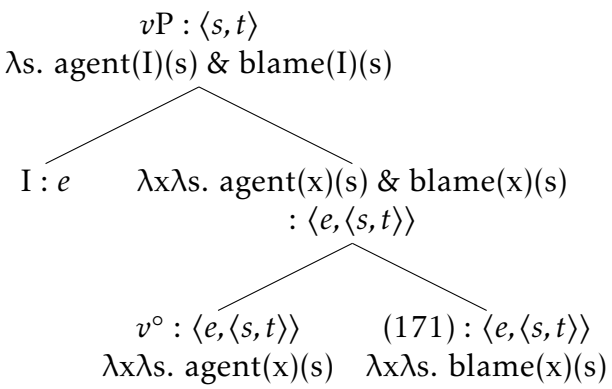
(171)



(172) a.



b.



The minimal pronoun would then receive its ϕ-features from its binder via feature transmission. This is how it gets interpreted as referring to the speaker, even though it is bound. Kratzer proposes a couple of mechanisms to derive this feature transmission, but they are tangential to this discussion, which relies only on the functional head-based binding mechanism. This binding mechanism will serve us throughout the analysis.

Another binding head is C°. The C° head is indexed, and binds a pronoun to create a property. This process, or ones like it, have been proposed for many sorts of complementizer heads. I will discuss these heads and the relevance of this process for switch-reference in section 4.1.3.3. It is not immediately clear exactly which functional heads can bind and which cannot. Kratzer shows that at least *v*° and C° can, and suggests (tentatively) that no others can. I will propose that

SR° is a binder, and that B°, the coordinator, can bind as well, since they are in the CP-layer. Pivot selection and anti-pivot selection will involve binding structures.

4.1.3.3 Semantics of $\overline{A}$-pronouns

At first glance, this proposal of anti-pivot selection seems to resemble that proposed by Finer (1984), in that there is a pronoun in the $\overline{A}$-level that is interpreted based on binding. However, the current proposal is actually very different, in three ways: The pronoun refers to the anti-pivot, not the pivot; the $\overline{A}$-semantics resembles that found with other embeddings; and the binding is indirect.

These differences are crucial— recall in Chapter 2 that I pointed out the syntactic and empirical problems with the Binding Approach, while alluding to its semantic problems. Now that we have a sense of the semantic facts needing an account, we can see these problems. The Binding Approach has been borrowed and adapted in a number of later accounts of switch-reference, but all of these are based on the syntax alone: the question of their interpretation does not come up. Yet it is crucial. If we examine the semantics of Finer's account, we see that it has three problems ensuring that it does not and cannot work as an analysis of switch-reference.

For one thing, it is not clear what a discontinuous T°/C° constituent would mean. We can perhaps get around that problem by assuming that C° and T° are distinct constituents in some kind of agreement relation with each other that requires co-indexation. If that assumption is true, the co-indexation would create a binding structure, where the index on C° is interpreted as a λ-operator binding the index on T°. This interpretation is problematic because it closes off the indexed C° from being bound by the dominant C°, or by anything at all.

The second problem relates to the semantics of $\overline{A}$-pronouns. An $\overline{A}$-pronoun is a pronoun in a non-argument position (in the CP-layer) that is in a dependency

relationship with a variable below it. This relationship comes about through movement or base-generation, but these are interpreted identically: A λ-binder binds the variable, creating a property through Predicate Abstraction. The $\overline{\text{A}}$-pronoun then saturates the property. The source of the binder index is not settled in the literature, but the theory of binding assumed here provides a clear one: C° is a binder.

Finer's theory is incompatible with this standard view of $\overline{\text{A}}$-semantics in three ways. First, if there is an $\overline{\text{A}}$-pronoun, it isn't at C°, but at [Spec, CP]. This minor fault is easily repaired. The second incompatibility is more serious: In the semantics, there is no semantic distinction between A-binding and $\overline{\text{A}}$-binding, so this pronoun will be bound by any co-indexed binder above it.To put this in terms of the binding theory assumed here: Nothing prevents *v*° from binding this pronoun, rather than the dominant C° as Finer predicts.

The third problem is the most serious: Simply put, it's the wrong pronoun. If there is an $\overline{\text{A}}$-pronoun involved in switch-reference, it must co-refer (directly or indirectly) to the anti-pivot, not the pivot. We can see this clearly by looking at a later theory of switch-reference that avoids the first two problems.

Mürvet Enç (1989) proposes a theory of switch-reference as part of a broader theory on binding and pronouns. Her investigation begins with the phenomenon of disjoint anaphors in Dogrib (Saxon 1984). The disjoint anaphor *ye* requires an antecedent, but cannot co-refer with it (173). Lacking an antecedent (174), the use of *ye* is ungrammatical.

(173) John **ye**-hk'è ha
John$_1$ DA-3:shoot FUT
'John$_1$ is going to shoot him$_{*1/2}$.'

(174) *eekhani **ye**-enda
this way DA-3:survive

'He lives this way'

Enç's proposes that this pronoun is related to two indices, one of which binds it while the other licenses it. The binder is an $\overline{\text{A}}$-operator (Op_n), and the licenser is an A-argument that must be its antecedent. In (173), *ye* is licensed by *John*, but bound by Op_1.

(175) Op_1 [John_2 [ye_1 shoot]]

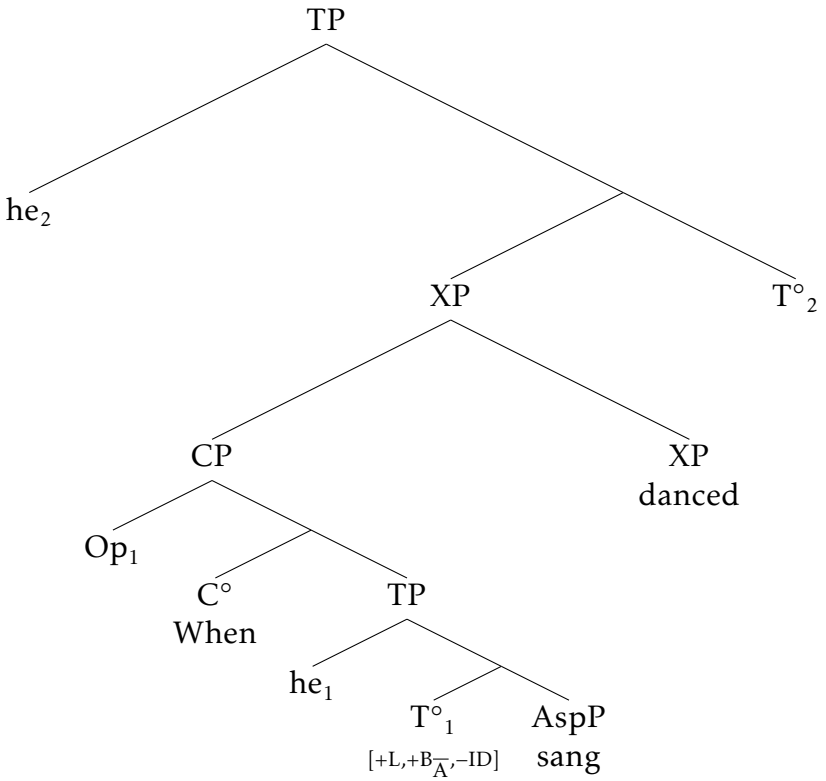
The need for an $\overline{\text{A}}$-binder and a licenser are specified by features, [+$\text{B}_{\overline{\text{A}}}$] and [+L], respectively. Importantly, there is a third feature on the pronoun, [±ID], which specifies whether the binder and licenser co-refer. For the disjoint anaphor, this feature is [–ID]. Since the pronoun is bound by the operator, it will always co-refer to it. However, the operator is disjoint from the licenser, so the pronoun is disjoint from its antecedent. This derives the disjoint anaphor morphology in (173):

(176) Op_1 [John_2 [$\text{ye}_{[+\text{B}_{\overline{\text{A}}},+\text{L},-\text{ID}]}$ shoot]]

This analysis is easily extended to switch-reference. Enç assumes that SR is a pronoun on T°, which gets its index from its specifier, the subject. T° bears a [+$\text{B}_{\overline{\text{A}}}$] feature, so it is locally $\overline{\text{A}}$-bound, by Op_1 in [Spec, CP]. It also bears a [+L] feature, so it needs an A-licenser. This licenser must be specified as non-local, thus avoiding the problem of needing an $\overline{\text{A}}$-antecedent in the dominant clause. If the ID feature is [+ID], SS marking appears. If it is [–ID], DS marking appears. Here is an example of this with DS marking.

(177) nya-isvar-**m** i:ma-k
when-sing-DS dance-TNS
'When he_1 sang, he_2 danced (Mojave, Langdon & Munro (1979))

(178)



Enç's theory of SR takes into account the presence of an $\overline{A}$-operator at the CP level, rather than a simple pronoun. In doing so, she provides some valuable insight about the semantics of switch-reference. The involvement of $\overline{A}$-binding requires the SR-pronoun to be below C°, as the current account proposes, rather than at C° as Finer proposes. It thus obviates the problem of a discontinuous T°/C° constituent. Also, the SR-pronoun has two arguments (its binder and its licenser), and it links them by a relation of identity or disjointness.

However, this theory does not get around the third problem with the semantics of Finer's account.[3] For Enç, the operator in CP is a pronoun. However, current

[3]There are also many reasons why Enç's broader theory of binding and pronouns is ultimately untenable. To wit: The full account of pronouns requires the implausible assumption must propose that *every* pronoun is bound. Even 'free' pronominals are bound by an Op_n at the root of their clause. Also, if we convert the binding operators to λ-binders, they lose the ability to be bound further. In addition, the licenser of the SR-marked T° requires some condition to make its own specifier invisible to it, to ensure non-local licensing. Finally, it has the same empirical shortcomings as Finer's account, since it was meant as a theoretical improvement upon it. These problems I will just mention here.

understanding of $\overline{\text{A}}$-phenomena is that the operator is a binder, and an $\overline{\text{A}}$-pronoun saturates the property that results from the binding. Thus, the structure of (178) should have the following LF: C° is co-indexed with T°, creating a binding structure. The index is interpreted as a λ-operator that binds the variable index on T°. Assuming, as before, that $\overline{\text{A}}$-binding is simply binding from C°, we get the structure in (179). This binding structure is interpreted as an abstraction, resulting in a property (λx. … x …).

(179)

We cannot insert a pivot pronoun to saturate this property. It would trigger binding problems, since there is no semantic distinction between A-binding and $\overline{\text{A}}$-binding. The subject in [Spec, TP] intervenes between C° and T°. If the subject is pronominal, we should get condition B effects, and if it is a full DP, we should get condition C effects. Also, we still have no semantics for the relationship of the licenser of T°. If that relationship involves binding, we run afoul of locality constraints. We can conclude that there is not a pronoun inserted at [Spec, CP]. The CP must be interpreted as a property.

A property-expressing CP is actually very welcome, because evidence from many phenomena converges on the observation that embedded clauses express properties. Propositions in general have been shown to be properties of possible worlds (Lewis 1979) or of situations (Kratzer 1989, 2002). Attitude clauses of different sorts have been shown to be properties of attitude holders (Lewis 1979) in *de se* attitudes, a general *res* argument in *de re* attitudes (of which *de se* is a special case, see Chierchia (1989); Kratzer (2006)), a property of relative head nouns (Kratzer 2009), or properties of content nouns (Moulton 2009). Conditional clauses are (quantified over) properties of worlds. Relative clauses are properties of their head nouns if externally headed (Heim & Kratzer 1998; Kratzer 2009), or properties of

situations if internally headed (Kim 2004). Adverbial clauses express properties of times, or events (Johnston (1994); Rothstein (1995)). In a situations semantics, we can say that adverbial clauses are properties of situations. In short, all sorts of types of embedded clauses express properties, so it should come as no surprise if SR-marked clauses do, as well.[4]

The propertization of the CPs emerges either out of an unsaturated argument or binding from C°. The problem for Enç (and Finer) is that all of these phenomena are interpreted in the same way: The property is ascribed to an argument in the dominant clause. If SR involves $\overline{\text{A}}$-binding, it involves binding from C° of an SR-pronoun, which creates a property that will be ascribed to an argument in the dominant clause. By definition, such an argument is an anti-pivot, not a pivot (section 2.1.3). Therefore, any pronoun introduced by switch-reference and bound by C° must be the anti-pivot argument of the switch-reference relation, not the pivot argument. Finer, Enç, and the others all have the wrong pronoun.

4.2 The SR Head and Pivot Selection

I showed in section 2.2.1.4 that switch-reference is introduced by a specific functional head in the extended verbal projection. Since this head's sole purpose is to introduce SR, I will propose that it is of the syntactic category SR°, which projects the SRP phrase. This projection sits above the inflectional layer, at the base of the complementizer layer. I discuss this structure in more detail in section 4.2.1.

SR° is a pronominal head that bears an index introducing an argument. SR° also gets a second index from the pivot it selects, via feature valuation and bind-

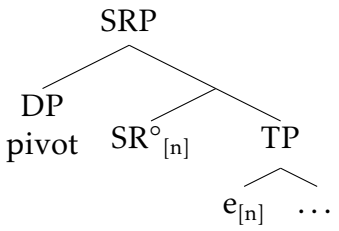
[4]Many embedded clauses actually express relations, for instance from entities to worlds or times. However, relations can be Schönfinkeled into a 'chain' of properties, and in any event, these relations come about by λ-abstraction.

ing. It also bears a switch-reference feature that introduces an SS or DS relation between the two arguments. Importantly, SR does not directly co-refer with either of its arguments. Instead, it relies on semantic binding to create properties that it composes with. In the following discussion I will explain how this mechanism works, then walk through a derivation.

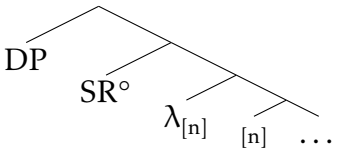
4.2.1 Binding and pivot selection

Let me briefly summarize pivot selection before discussing particular examples. The SR° head bears an index that co-refers with an argument below it (for exposition, let's call this the 'pivot index'). It thus binds that pronoun (an empty category) and creates a property that is saturated by the pivot in [Spec, SRP]. A basic syntactic structure for subject pivots is in (180a). At LF, the structure is in (180b).

(180) a.



b.

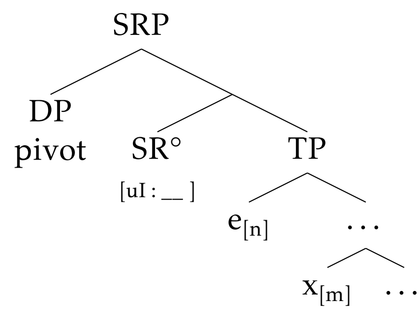


While SR° can bind, it differs from v° and C° in two respects. First, it is obligatorily indexed. If it isn't indexed, it cannot be interpreted properly. Second, it cannot be inserted into the structure with a pivot index. Instead, it must acquire it. The reason for this is that it cannot select its pivot freely. Other binders can bind any item they c-command that happens to be co-indexed, but SR° can only bind the argument below it that is highest in the structure.

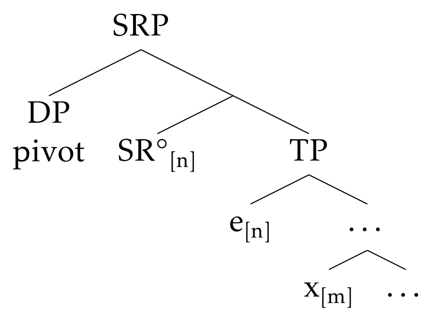
I assume that this height requirement is reduced to relativized minimality (Rizzi 1990, 2001). This requirement is derivable through feature checking and

valuation, which are independently subject to the same requirement. I propose that SR° bears an unvalued interpretable feature, [uI:__]. This feature is valued by an index feature, and through standard feature probing mechanisms, it will be valued by the highest index feature below it (181a). Once the SR° head is valued with an index, it acquires that index via feature sharing (181b). At that point, this index can be interpreted at SR° as a binder like any other index.

(181) a.



b.



4.2.2 Selection of entity pivots

To demonstrate how the syntax and semantics interact in pivot selection, it's best to use an example. Here is an earlier DS-marked clause from Kiowa. It has a *when*-clause, so it involves entity-tracking.

(182) Nén máunyȁigàu é̱ bó̱ȅ̱

nế́n– mɔ̃́n+jajː-gɔ ế́– bóː=ẽː

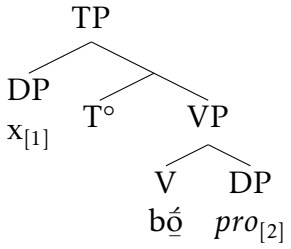
[1s:3d:3s] hand+wave–PF [3s:1s] see.PF=**when.DS**

'I waved when she$_1$ saw me$_2$' (Kiowa, f.n.)

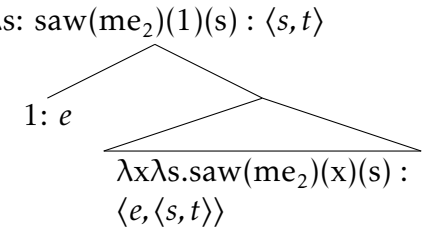
Let's focus on the *when*-clause in (182). Note that in Kiowa the subject and object are both *pro*; the latter is represented as such in the structure, but the former is a null pronoun, for reasons that will be evident. An abbreviated structure of the

TP in this clause is in (183a), and the corresponding semantics (translated into English for clarity) in (183b). The subject pronoun is interpreted as just an index.[5]

(183) a.

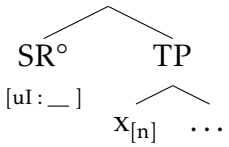


b.

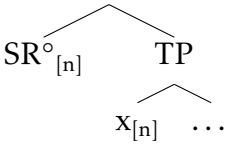


Here are the steps of pivot selection.

1. SR° takes this TP as its complement. Its unvalued index feature is valued by the first index it finds, that of the subject DP.



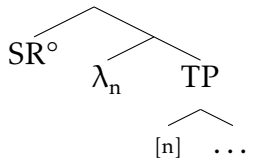
2. Through the Agree relation, SR° takes on the index of the subject, creating a syntactic binding structure.



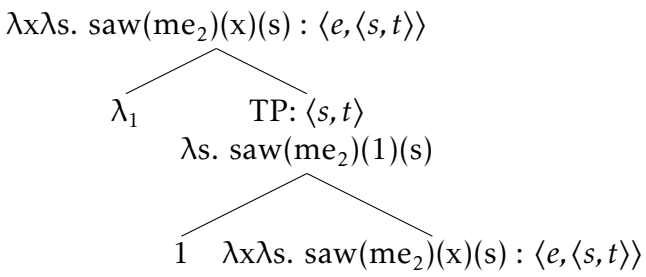
3. This binding structure corresponds to semantic binding; the higher index is parsed as a λ-operator over the TP.

---

[5]The subject DP in (183a) will have originated in [Spec, *v*P]. The semantics also ignores *v*P, which I will assume distinguishes external arguments from internal arguments in such way that only internal arguments are arguments of the predicate itself.



At this point, we should jump directly into the semantics so that the contribution of SR° can be made clear. In the semantics, the syntactic mechanism in steps 1-3 will be interpreted as Predicate Abstraction over the TP.[6] The relation that results will be the input to SR°.



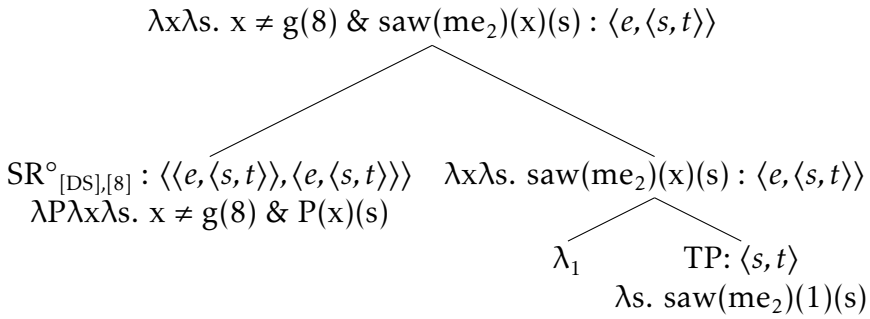
The semantics of the SR° head depends on the three features it bears. I've discussed its unvalued index feature and the switch-reference feature, but there is also a simple index feature. This index feature is interpreted as a pronoun argument of the switch-reference condition. As I pointed out in section 4.1.3.3, this index will be associated with the anti-pivot, not the pivot. I will call this index the 'anti-pivot index' for clarity. We can write the denotation of the SR° head in this structure as follows:

(184) $[\![\text{SR}^\circ_{[\text{DS}],[\text{m}]}]\!] = \lambda\text{P}\lambda\text{x}\lambda\text{s. x} \neq \text{g(m)} \ \&\ \text{P(x)(s)} : \langle\langle e,\langle s,t\rangle\rangle,\langle e,\langle s,t\rangle\rangle\rangle$

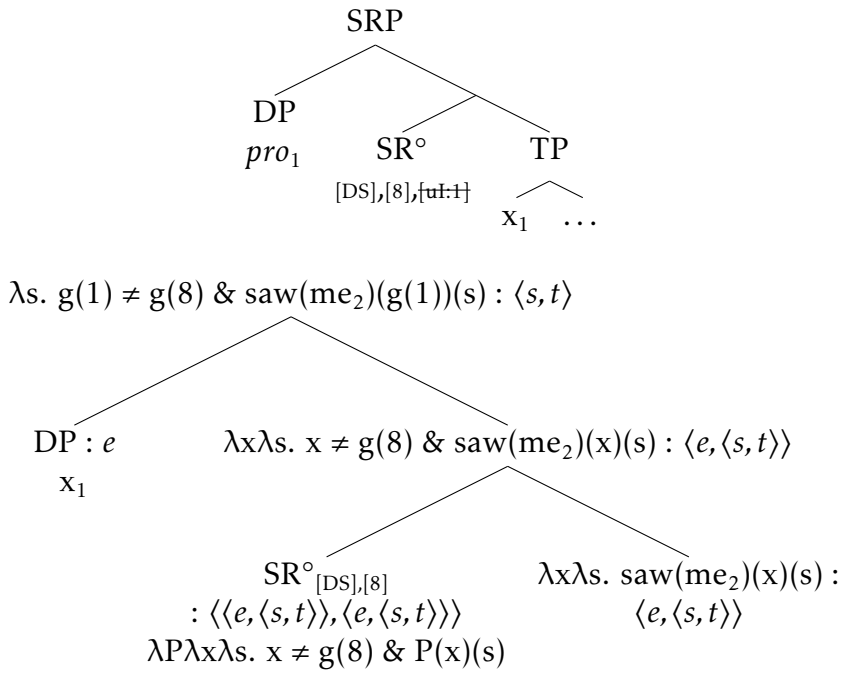
> SR° denotes a function from a relation between entities and situations to another relation between entities and situations. It adds a condition to the entity argument (the pivot), such that it is co-referent from or disjoint to the pronoun g(m).

[6] In the semantic composition, I will add category labels as guideposts to help the reader; they are not actually interpreted.

4. The SR° head takes the TP as its first semantic argument. Since it exhibits DS marking, it has a [DS] feature. For an anti-pivot index, I will arbitrarily assign the number 8. As an index feature, it is represented as [8].



5. Coming back to the syntax, we can progress to complete the SR projection. The pivot is inserted at [Spec, PivP]. In the semantics, this is interpreted as the pivot saturating the entity argument, leaving a proposition.



This structure derives the selection of entity pivots, and accounts for the generalization that switch-reference tracks subjects, but no lower argument. However, the consequences of this proposal need to be addressed, notably the base-

generation of pivots at [Spec, SRP], especially when the pivot is a full DP. Before doing that, though, we need to account for situation pivots.

4.2.3 Selection of situation pivots

The SR° head selects situation pivots using the same mechanism it uses to select entity pivots. Accounting for situation pivots will require only a small amendment to the semantics of the SR° head. Since the basic mechanism has been explained, I will start with an example of situation-tracking SR. This case is from earlier (100), and it exhibits non-canonical DS marking.

(185) a. Óp á ə̀lə̀
óp á*– ʔaːl–eː
there [3p:3s] chase–PF
'They$_1$ chased it over there'

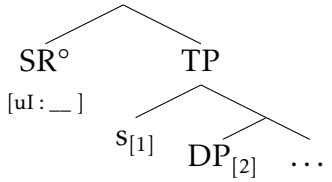
b. **nègáu** óp jáuchò á ə̀lə̀
negɔ́ ʔóp tɔ́=tso ʔá*- ʔaːl-eː
and:DS.then there like this=instead [3p:3s] chase–PF
'And then they$_1$ chased it this way' (Palmer, Jr. 2003)

Let's focus on the SR-marked conjunct in (185b). The nominal arguments in the clause are all *pro*. In addition, there is a silent topic situation pronoun located above the subject's position at [Spec, TP]. Thus, the TP is of type *t*.

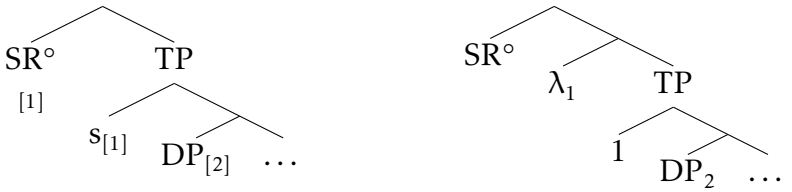
(186) Nàu hègáu[7] s$_1$ *pro* óp jáuchò á ə̀lə̀.

1. The SR° head's unvalued index feature is valued by the highest index feature in its complement; in this case it is that of the topic situation.

[7] I will ignore this adverbial in the tree structures.

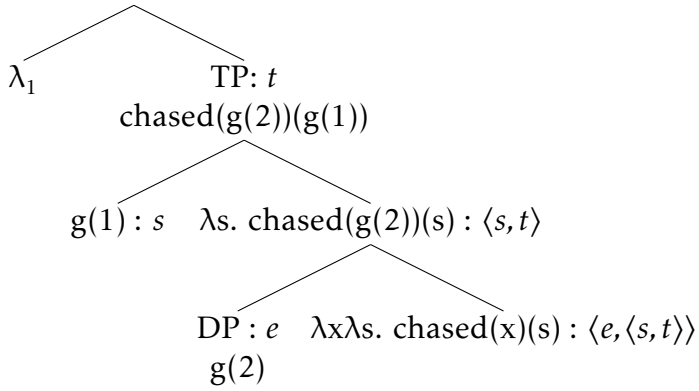


2. Through this process it adopts the pivot index. This creates a syntactic binding structure, which corresponds to a semantic binding structure, where the index is parsed as a λ-operator adjoining to TP. The situation is parsed as a variable index, bound by the higher index.



Since this structure involves Predicate Abstraction over a sentence of type t, the result is a proposition (of type $\langle s,t\rangle$). In (187) is the semantic composition of the steps so far. For clarity, I will abbreviate the semantic structure by translating the expression *chased it this way* as 'chased', and ignoring the *v*P, aspect, and tense.

(187)



Now we can revisit the semantics of the SR° head. The denotation proposed in (184) cannot work here. In (184), SR° takes an expression of type $\langle e,\langle s,t\rangle\rangle$, and returns an expression of type $\langle e,\langle s,t\rangle\rangle$, such that its pivot argument is an entity. However, with situation pivots, its first argument would be of type $\langle s,t\rangle$, and SR° would return an expression of type $\langle s,t\rangle$. Because of this type mismatch, we have to amend our semantics of SR°.

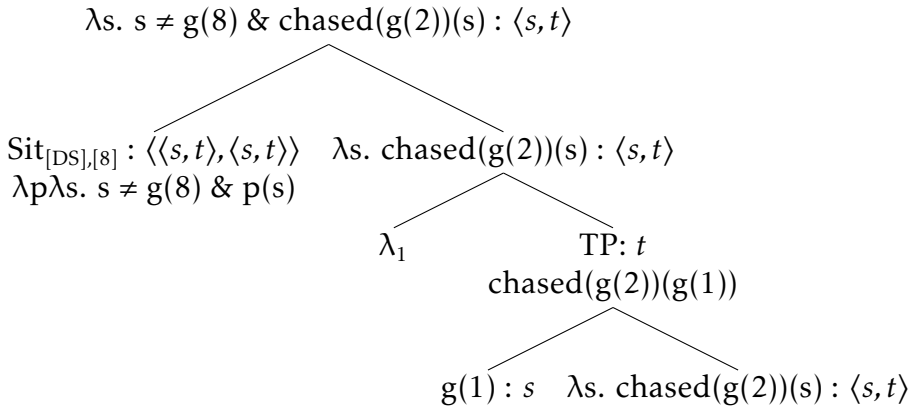
I propose that there are two lexical items of category SR°. We can call the first one Ent (for entity), and the second one Sit (for situation). Ent with a [DS] feature and an anti-pivot index feature [n] has the same denotation as the SR° head in (184). I repeat it in (188a). Sit with [DS] and [n] has the denotation in (188b).

(188) a. $[\![\text{Ent}_{[DS],[n]}]\!] = \lambda P \lambda x \lambda s.\ x \neq g(n)\ \&\ P(x)(s) : \langle\langle e, \langle s, t\rangle\rangle, \langle e, \langle s, t\rangle\rangle\rangle$

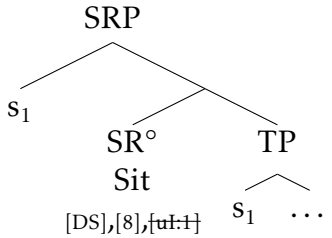
b. $[\![\text{Sit}_{[DS],[n]}]\!] = \lambda p \lambda s.\ s \neq g(n)\ \&\ p(s) : \langle\langle s, t\rangle, \langle s, t\rangle\rangle$

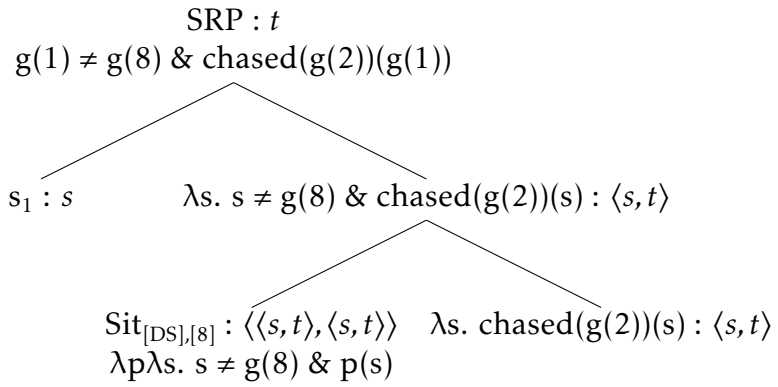
With this revised semantics for the SR° head, we can return to the example.

3. Sit takes the result of the abstraction as its first semantic argument, returning a proposition. The [DS] feature derives its DS marking. I arbitrarily assign the index 8 to the anti-pivot pronoun.



4. Coming back to the syntax, we can progress to complete the SR projection. The pivot is inserted at [Spec, SRP]. In the semantics, the pivot saturates the first argument of the proposition, and the result is that the SRP is of type *t*.





4.2.4 Pivot selection with SS marking

SS marking, like DS marking, reflects a feature on the SR° head. The [DS] feature introduces a relation of non-identity between the pivot and the anti-pivot. SS marking occurs when SR° bears an [SS] feature, which introduces a relation of identity between the pivot and the anti-pivot. This feature is interpreted along with the other features on SR°. The denotations of the two SR-selecting heads, Ent and Sit, with SS marking, are as follows; they are identical to (188a) and (188b), except for the identity relation.

(189) Given an index n...

a. $[\![\text{Ent}_{[\text{SS}],[\text{n}]}]\!] = \lambda P \lambda x \lambda s.\ x = g(n) \ \&\ P(x)(s) : \langle\langle e, \langle s, t\rangle\rangle, \langle e, \langle s, t\rangle\rangle\rangle$

b. $[\![\text{Sit}_{[\text{SS}],[\text{n}]}]\!] = \lambda p \lambda s.\ s = g(n) \ \&\ p(s) : \langle\langle s, t\rangle, \langle s, t\rangle\rangle$

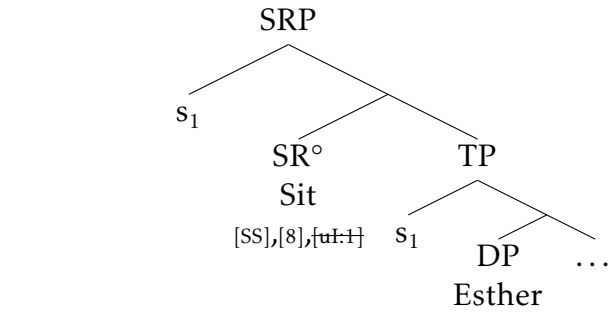
The syntax and semantics proceeds as it did with DS marking. Thus, I will simply present an example of situation-tracking SS (190) and entity-tracking SS (191), along with the structures and semantics of the pivot clause of each. In both cases, I arbitrarily assign the index feature [8] to introduce the anti-pivot index. This might seem odd at first, since it gives the result g(1) = g(8), but once the anti-pivot selection takes place, it will turn out not to matter.

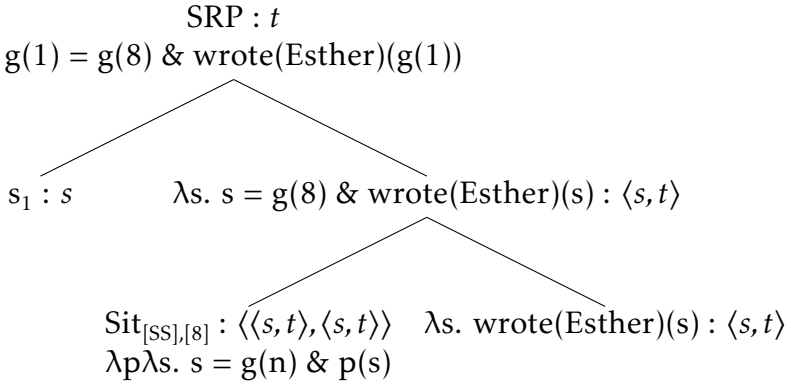
(190) Kathryn gà gút gàu Estheràl gà gút

∅ K. gʲæ– gúʔ [gɔ ∅ E.-al gʲæ– gúʔ]

s_1 K. [3s:3p]– write.PF and.SS s_1 E.-also [3s:3p]– write.PF

's_1 Kathryn wrote a letter and s_1 Esther wrote one too' (f.n.)



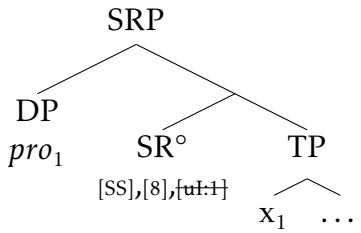


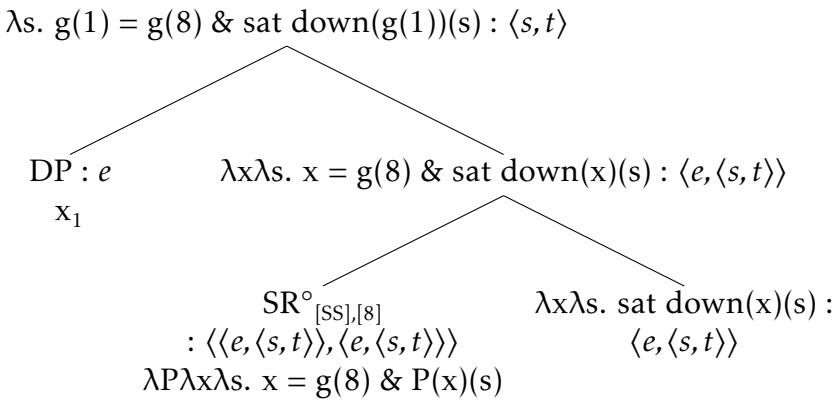
(191) Hébà**chè** èm sáu.

[∅– héːbà=tsẽː] ẽm– sɔ́ː

[3s]– enter.PF=**when.SS** [3s:RFL]– sit down.PF

'[When she$_1$ came in], she$_1$ sat down.' (f.n.)





4.2.5 Summary

This concludes the discussion of the current proposal about the nature of the switch-reference morpheme, and the mechanism of pivot selection. To summarize the nature of the SR morpheme:

1. SR morphology is introduced by a head on a particular category, SR°.
2. Two different lexical items are of category SR°: Sit is used for situation-tracking, while Ent is used for entity-tracking.
3. SR° bears an index feature that introduces an anti-pivot variable.
4. SR° bears a feature indicating identity or non-identity of its arguments.

To summarize pivot selection:

1. The SR° head merges above the inflectional layer.
2. It bears an unvalued index feature that is valued by the first index below it, selecting its pivot.
3. Through valuation, SR° acquires the index of its target.
4. The co-indexation creates a binding structure that feeds the interpretation of the SR° head.

5. The actual pivot itself merges at [Spec, SRP].

The interaction of the SR° head with binding and feature valuation accounts for the selection of situation and entity pivots, corresponding to the types of clauses each is found in. This proposal thus derives several of the generalizations about the switch-reference head and pivots.

Besides its empirical adequacy, this proposal relies on mechanisms that have independent motivation. Pivot selection employs grammatical mechanisms used in many other parts of the structure. This efficiency is not only advantageous in terms of theoretical elegance, it is compatible with notions of economy in the grammar natural language.

Finally, this account of pivot selection and the SR° head gains considerable support from fruitful predictions. It derives the configuration effect for free, it predicts certain observations about switch-reference pivots, and it is compatible with possible variation among SR systems.

4.3 Predictions of the pivot selection mechanism

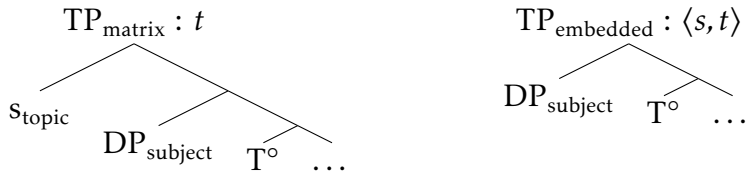
4.3.1 Deriving the configuration effect

The previous chapter demonstrated a link between pivot type and clause juncture type. With coordinating conjunctions, switch-reference tracks topic situations, while with subordinating connectives, it tracks subjects. This is a robust effect in Kiowa, and it appears to be cross-linguistic. However, despite being a configuration effect, it has no obvious source in the syntax. It is well-established that coordination is a type of subordination, so there is no major difference in clause type from a structural point of view. Furthermore, switch-reference is not introduced by the connective, so it is not at first obvious why the type of connective should even matter.

We must turn to the semantics. An investigation will show that the key source of the effect is not the connective itself. The semantics of the pivot clause and the theory of feature valuation interact in a way that allows us to derive the configuration effect.

When we examine the semantics of the Kiowa pivot clauses, we see that their semantic type varies in such a way that it correlates strongly with the type of pivot. Matrix clauses with situation pivots are of type t, and adverbial clauses with entity pivots are of type $\langle s, t \rangle$. This difference stems from the fact that matrix clauses contain a topic situation pronoun (over which they are asserted), while adverbial clauses are intensional: their topic situation argument remains unsaturated, and ends up bound by some operator.

(192)

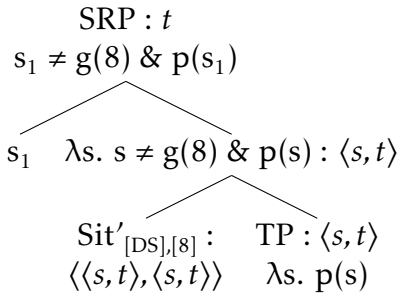


Informally speaking, situation-tracking SR is only possible when there is a situation to track. In formal terms, the insertion of Sit at SR° is restricted to configurations where its complement clause has a topic situation pronoun. The syntax and semantics both work to ensure this restriction.

Intensional clauses lack a topic situation pronoun, so there is no way for SR° to select a situation pivot. We saw this in example (183). Note that it does not matter that the proposition has a situation *argument*. The rules of semantic composition require a condition to restrict an argument before its saturation, but the syntax of feature valuation does not allow it; the unvalued index feature is restricted to targets with an index feature. Since the lexical semantics of Sit or Ent derive from this valuation, the SR condition can also only be applied to an argument in the syntactic structure below it.

The semantics allows us to drive the point home with a reduction argument based on type-theory. Suppose that Sit could be used with subordination (182). We'll call this head Sit'. The first argument of Sit' has to be a proposition. The embedded TP on its own is of the right type. However, it only remains of the right type if we ignore the binding resulting from the index feature valuation. Let's suppose that Sit' does not have the unvalued index feature, and try to compose (193). The TP of type $\langle s,t\rangle$ is the first argument to Sit. The result is another proposition, but if the pivot is the topic situation, we end up with a SRP of type t, and that cannot be embedded under an intensional operator.[8]

(193)



In intensional clauses, the syntax and semantics both prevent switch-reference from tracking a situation pivot. The highest argument will be the subject. In matrix clauses, it will be the topic situation. Thus, this account derives the configurational difference, independent of the connective itself, with no additional machinery. This derivation is thus a major point of support for the theory proposed in this chapter.

Another important prediction this theory makes is that embedded SR-marked clauses that are not intensional should employ situation-tracking. This is the case for coordinating conjunctions, as we have seen. Before discussing further, though, let me clarify what I mean when I describe a clause as intensional. I am using 'intensional' here to describe a clause whose situation argument is bound by an operator, rather than saturated by a topic situation pronoun. This differs from a

[8]Reminder: The unvalued index feature is how we derive subject-tracking.

broader sense of intensionality in the literature. This broad sense can apply to any proposition, as it would to any predicate of situations, times, or worlds.[9] As we will see when we discuss anti-pivot selection, coordinated clauses are properties of situations as well. Nevertheless, that situation argument is bound or saturated outside the pivot clause. Below the coordinating conjunction, the pivot clause contains a topic situation pronoun.

It is very probably the case that clause-chains are not intensional in the sense I describe. I pointed out in section 2.2.2.3 that clause-chains behave like coordination when it comes to switch-reference, except that the pivot clause precedes the anti-pivot clause. Non-canonical switch-reference is found in clause-chains as well. The switch-reference facts indicate that clause-chained pivot clauses contain a topic situation pronoun. This matches with the widespread observations that they seem to be semantically independent of the other clauses, despite being syntactically dependent. The semantic independence of a clause can be derived from the presence of its own situation pronoun. I can only conjecture about clause-chains at this point— to my knowledge, no one has thoroughly investigated their formal semantics. Undoubtedly, the logistical difficulty of conducting the research with far-flung or outlying languages constitutes a major hurdle. However, I do believe that it would be worth the effort and expense, and that this account of switch-reference provides a useful stepping stone for future inquiry.

What about other types of embedded clauses? This account predicts that SR-marked clauses where a situation pronoun can be established below the connective will have situation-tracking SR, while those without one will have subject-tracking. As a result, the appearance of non-canonical switch-reference ought to

[9]Situations include times (a time interval across all spaces in a world) and worlds (which are maximal situations).

be relatively predictable. Conversely, the presence of non-canonical SR in a clause should indicate that a clause is non intensional.

Kiowa has no other SR-bearing connectives to test for, so fieldwork in other languages will be required to test this prediction. One possibly fruitful case is Choctaw, which has SR-marking on because-clauses, which may contain a topic situation pronoun. I am not aware of any research on the situation semantics of because clauses, but their syntax (Sawada & Larson 2004) and their scope effects (notably with negation) offer strong potential at enlightening us about switch-reference.

4.3.2 Base-generation of pivots

Another feature of this proposal that warrants discussion is that overt pivots are base-generated in [Spec, SRP], while their argument positions are filled by a null pronoun. This is a consequential proposal, notably for subject pivots. Subject movement from [Spec, *v*P] or [Spec, TP] is *a priori* more plausible, since it has a lot of independent motivation. However, we will see that the consequences of base-generation are positive.

Proposing that topic situation pivots are base-generated is essentially trivial, since there are no predicted effects on the morphology, syntax, or semantics beyond what is required for switch-reference. Situation pronouns are already null, leaving no morphosyntactic evidence for either base-generation or movement. There are no scope-bearing positions between the insertion site of the topic situation and the SR° head[10], so no semantic effects should arise. Thus, we can assume that the base-generation account is perfectly suitable for situation pivots.

[10]This may not be the case for evidentials, but the semantics of evidentials (whence their scope facts) is a matter of debate (Faller 2002; Aikhenvald 2004: i.a). Until a clearer picture emerges, and is demonstrated for Kiowa, I will abstract away from them.

For DP pivots, however, the picture is more complicated. Proposing the base-generation of subjects in [Spec, SRP], outside the inflectional layer, is quite a departure from what we know about subjects. So it ought to be clear that they are in fact base-generated there. Notably, we should find signs of high placement with no movement effects. This is what we find, both in the syntax and the semantics.

A base-generation account has some advantages: It explains pivot height effects in placement and interpretation, and it permits quantified pivots. On the other hand, it is difficult to precisely pinpoint overt DPs in Kiowa, and some of the movement effects that one could test for are not possible to test.

One clear sign of pivot height is that pivots are never found very low. To test for height, we cannot rely on functional heads, since Kiowa is generally head-final. However, we can look at the position of pivots relative to various adverbials. Watkins (1984) observed that many Kiowa adverbials select for aspect, negation, or modality. For instance, the habitual morpheme *àn* only appears when the verb is marked for imperfective aspect. The adverbial *béthàu*, meaning 'I didn't know, to my surprise' only applies when the verb is marked for indirect evidentiality.

Harbour (2007) derives this selection through Spec-head agreement. The adverbial sits in the specifier position of the particular inflectional head, and restricts its value.[11] Two key pieces of evidence are relative ordering and recurrent mirroring effects.[12] For instance, EvidP sits above AspP, so its specifier ought to precede that of AspP. Thus, *béthàu* should always precede *àn*, and it does.[13] Moreover, since Kiowa is right-headed, we should see the inflectional morphemes on the verb in

[11] I suspect that an explanation based on semantic composition restrictions might be more plausible in the long run, since adverbials typically are not specifiers, and since discourse configuration can displace some of them, as (Adger & Harbour 2007a: p. 17) note.

[12] I described these briefly in Chapter 1.

[13] In my fieldwork I unexpectedly elicited a translation with clause-final *béthàu*; other evidence is suggestive that these adverbials' positions are not always fixed.

the reverse order: aspect before evidential. We do. Both of these are demonstrated in (194), from Adger et al.'s (2009) book that builds on this observation.

(194) Béthàu àn áu– bô+hàunxɔ̀-yǐ-thàu-dɛ̀
unbeknown HAB [∅:3s:3i] always+come late-IMPF-MOD-EVID
'Unbeknown (*i.e.*, I didn't realize) he was going to keep on coming late' (Adger et al. 2009)

The present proposal predicts that subject pivots are higher than the inflectional layer, so we should find them above all of these selecting adverbials. This is clearly the case for lower ones, like negative *hàun* (NegP). In (195), we see that the pivot cannot be found lower than negation, even though in matrix clauses, it can.

(195) a. Nén máunyàigàu [Bill háun é bɔ̄́mâuɛ̄̀]
nɛ́n– mɔ́n+jaj:-gɔ B hɔ́n ɛ́– bɔ́-mɔ̂=ɛ̃:
[1s:3d:3s] hand+wave–PF B. not [3s:1s] see-NEG=when.DS
'I waved when Bill didn't see me.' (f.n.)

b. *Nén máunyàigàu [háun Bill é bɔ̄́mâuɛ̄̀]

Notably, when the embedded clause does not have switch-reference, the subject can be located lower than negation. For instance, relative clauses permit low subjects.

(196) Háun Bill mátàun qáujédè kídêl gà qáujé.
hɔ́n B mátɔ̃n ∅– kʔɔ́té=de kʰídêl gʲæ– kʔɔ́té
not Bill girl [3s:3s] meet.PF=NML yesterday [1s:3s] meet.PF
'I met [the girl that Bill didn't meet] yesterday.' (f.n.)

One difficulty in establishing height with these adverbials is that some of the higher ones, like *béthàu* (EvidP), or *hayatjo*, 'perhaps' (ModalP), do not seem to be available inside adverbial clauses. My consultants did not allow the adverbials to

be placed there, and I found no examples in texts. They are readily available in matrix clauses, but those have situation pivots. I should note that both evidential and modal inflection are available inside an adverbial clause, so the restriction isn't syntactic.

Other adverbials can give us evidence of high pivots. Besides these fixed-position adverbials, temporal adverbials are associated with the TP level. Pivots are located above these as well. In (197), the adverbial is clearly below the pivot. In (198), it seems to be above the pivot, but it may actually be in the matrix clause.

(197) Bill **kı̋dêl** chánthȁunàu, bá bȍ̠jȁu.
B. kʰíːdêl ∅– tsán-tˀɔː=nɔ̃ bá*– bɔ̃ː-tɔː
Bill today [3s]= arrive.PF-MOD=DS [1pi:3s] see.PF-MOD
'If Bill comes today, we'll see him. . . .'

(198) **Kı̋dêl** [Bill chánthȁunàu], bá bȍ̠jȁu.

To be certain that the adverbial is in the embedded clause, we can postpose it, but speakers rejected it. It's not clear, however, whether this is due to a binding effect or the placement of the pivot.

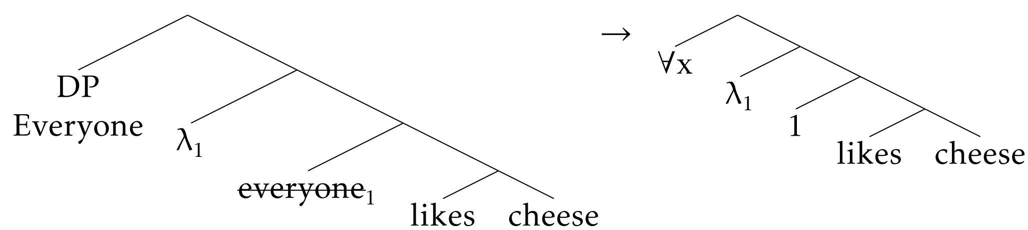
(199) *Bá bȍ̠jȁu [**kı̋dêl** Bill chánthȁunàu],
'We'll see him_1, if Bill_1 comes today'

To summarize, there is syntactic evidence that strongly suggests that pivots must be high, as predicted by this account. A lot of the things that might show movement, however, are difficult to test for because of the 'free' nature of Kiowa word order.

Besides the syntactic evidence, semantic evidence supports high pivots. Lacking any reconstruction targets, any scope-bearing pivot must be interpreted high. This is the case for indefinite DP pivots, which must be specific. In (200), consultants rejected existential interpretations of indefinite pivots.

(200) **Hájél** chánẽ̱ jẽ́ ém kúnhâ.
hátél ∅ tsɑ̃́n=ẽː téː ʔẽm– k^{h}ún+hâː
someone [3s] arrive.PF=**when.DS** all [3p:rfl] dance+arise.PF
'When someone showed up, everyone got up to dance.'
Consultant: "You're waiting for a particular person to show up."

Finally, another advantage of base-generation is that it provides a simple explanation for the use of quantificational pivots. Quantificational pivots are not referential, since they are not interpreted with respect to the assignment function. Instead, a quantified DP is interpreted as binding its copy, which is interpreted as a variable (201). They do not have an index feature of their own. Thus, the unvalued index feature on SR° should not be able to select them.

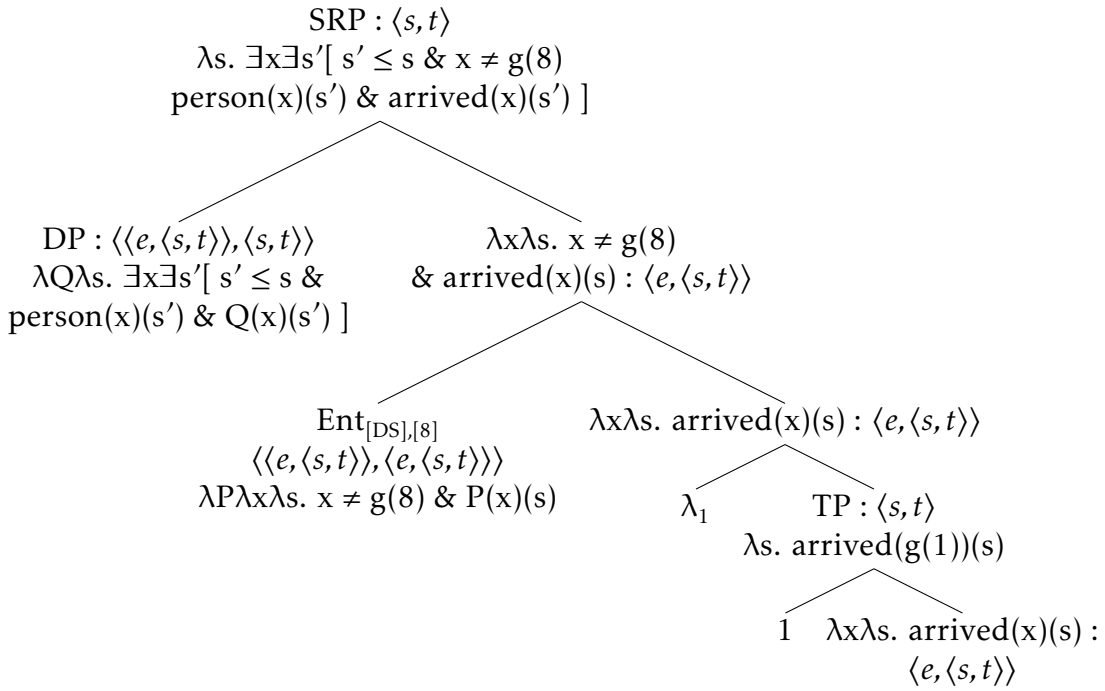
(201)


However, as we saw in (200), quantificational entity pivots are allowed. The proposed structure of switch-reference, combined with base-generation, predicts that they should be. A quantifier needs to bind a variable in order to be interpreted. If a quantified pivot is generated at [Spec, SRP], there is no place for QR, so there is no trace to bind. However, the structure already provides a variable to bind, the subject, and a binder: SR°. The binding at SR° creates a relation that serves as the input to a quantifier.

Below, we see the SRP embedded in (198). I assume the denotation in (202) for *someone*, which is a simplified version of Schwarz's (2009) denotation of the determiner *every*.[14]

[14]Domain restriction is effected by a part relation (≤). I abstract away from exemplification (Kratzer 2007) and a matching function in the nuclear scope.

(202) $[\![\text{someone}]\!] = \lambda Q \lambda s.\ \exists x \exists s' [\ s' \leq s\ \&\ \text{person}(x)(s')\ ]\ \&$
$\exists s'' [\ s' \leq '' \leq s\ \&\ Q(x)(s'')\ ] : \langle\langle e, \langle s, t\rangle\rangle, \langle s, t\rangle\rangle$



4.3.3 The meaning of the anaphoric relation

The fourth desideratum of a theory of switch-reference is the relation between the pivot and anti-pivot. In the present proposal, that relation is one of identity or non-identity. The relation's value is introduced by a feature on the SR° head. [SS] introduces an identity relation and is marked by SS marking. [DS] introduces a non-identity relation and is marked by DS marking. The use of an identity relation adequately accounts for the reference-tracking effects of switch-reference without any unwieldy or *ad hoc* mechanism.

However, the [DS] and [SS] features are privative. We might wonder whether there is some more basic binary feature that gives us identity (*à la* Enç). For now, though, we should persist with privative switch-reference features. Not only is it unclear that binary features are necessary, but the use of privative features obtains two clear typological advantages. One is that we can rely on the lexicon to explain

why some languages only mark DS or only mark SS, and not both. The second is that we do not rule out the possibility that switch-reference in some languages can involve relations besides identity.

It's wise to keep that possibility open because of two types of unexpected switch-reference that have been noted in the literature: inclusive (or overlapping) reference, and open-reference. Inclusive reference is discussed in Chapter 2 (section 2.4.2) as a problem for Finer's (1984) reliance on the Binding Theory. Essentially, in some languages, SS marking must or can appear if the pivot is a subset of the anti-pivot, a superset of the anti-pivot, or intersects with the antipivot. Binding ignores partial identity, so it is unsuitable for explaining these observations. But an anaphoric relation can well include a subset, superset, or intersective relation in addition to an identity relation. Stirling (1993) proposes that SR does exactly that, and it may be the case that it does. If so, we would not want to be limited by a binary feature.

The idea that SR relations include these set-related notions is not far-fetched; they form a regular part of many semantic analyses, so if the data supports their presence, we can rest assured that the formal logic already does. However, this dissertation has shown conclusively that the source of unexpected SR marking often has nothing to do with the subject identity, but is instead derived by situation-tracking. This is especially the case for SR-morphemes with clause-chains or coordination. Until the source of the unexpected marking can be pinpointed, I reserve judgment.

The second area of variation with the fourth desideratum is what is called open-reference. It was first proposed by Nichols (1983) in discussing Chechen, but has also been proposed in Inuktituk (Pittman 2005). Essentially, open-reference underspecifies for identity. For Inuktituk, Pittman claims that *-llu* is an SS marker, since it is only available when the subjects co-refer.

(203) Alana-up ujagak atja-**tlu**-gu ani-vuk
A.-ERG rock:ABS carry-*llu*-3sO go out-INTR.INDIC.3s
'While Alana$_1$ was carrying the rock, she$_{1/*2}$ went out'

The string *ti-llu-* indicates open-reference; it allows either subject co-reference or disjointness.

(204) a. pisuk-**ti-llu**-ŋa iŋŋi-lauq-tuq
walk-*ti-llu*-1s sing-DISTPT-3s
'While I was walking, he was singing'

b. pisuk-**ti-llu**-ŋa iŋŋi-lauq-tuŋa
walk-*ti-llu*-1s sing-DISTPT-1s
'While I was walking, he was singing'

If Pittman's claim of open-reference marking is correct, it can be explained with an underspecified anaphoric relation on SR°. We might imagine something like in (205). The pivot and anti-pivot still have to be of the same type, so perhaps there would be a feature [SR] that ensures they do, with the relation in (205a).

(205) a. For any two arguments α and β,
λαλβ. $T(\alpha)(\beta) = 1$ iff α and β are of the same semantic type.

b. Imagined underspecified entity-tracking switch-reference marker, given some index n:
$[\![\text{Ent}_{[SR],[n]}]\!] = \lambda P \lambda x \lambda s.\ T(x)(g(n))\ \&\ P(x)(s)$

A underspecified switch-reference relation would not be completely out of place, considering that underspecification has been shown to be useful in understanding other heads on the extended verbal projection. A non-exhaustive list includes tense (Matthewson 2006; Lin 2006; Abusch 1997; von Stechow 2003), aspect (Böhnemeyer & Swift 2004), modality (Deal 2010), and evidentiality (Aikhenvald

2004). The particular formal implementation of underspecification in (205) might not be ideal, but it's just a suggestion. The idea of an underspecifed SR marking is very plausible, if the evidence supports it.

However, like with inclusive or overlapping reference, I believe a closer look at the evidence is required before including open-reference into a theory of switch-reference. For the former, it was not clear that subject-reference was at issue. For the latter, it is not clear that we are even dealing with switch-reference.[15]

Looking at Pittman's examples closely, we see that there are three signs that this phenomenon is not switch-reference. The first is that the purported open-reference marker (*-ti-llu*) includes the SS marker (*-llu*). This suggests that *-ti-llu* marks both SS and open-reference. For purposes of semantic composition, double-marking is extremely odd. When two features combine like this (e.g. among ϕ-features), their meanings interact, but do not cancel out. Also, other heads in the extended verbal projection do not allow multiple-marking, so SR° should not allow it, either.

The second sign is that the verb morphology is lacking. We saw in Chapter 2 that SR morphemes can condition tense and agreement morphology. SR can even trigger defective marking. However, in Inuktituk, the presence of these markers simply precludes tense and aspect marking, as well as agent agreement. Only absolutive agreement is possible on either *-llu* or *-ti-llu*; in fact the latter does not even permit transitive predicates. These clauses' restrictions, along with their temporally dependent nature, allows us to suggest that they are smaller than full TPs. What is going here may simply be an instance of so-called VP-coordination,

[15]This uncertainty prevented me from including open-reference in the survey of switch-reference in Chapter 2.

which, as in English and other languages, only works with the same subject.[16] This is purely a conjecture, of course, but it seems more plausible than proposing switch-reference. Perhaps *-llu* indicates a close relation between events, while *-ti-* marks simultaneity.[17]

The third sign is that Pittman herself proposes that *-ti* and *-llu* are not SR markers *per se*, but temporal markers. *-llu* introduces a time variable inserted at T°, while *-ti-* is a binder over times at C°. This proposal is actually plausible, as well as quite interesting, although it is perhaps more likely that *-llu* introduces a relation over the time variable rather than referring to it directly.[18]

All in all, the case for switch-reference in Inuktituk, much less the case for open-reference, is far from convincing. Similar statements can be made about Chechen or the Bantu languages (Wiesemann 1982), languages with purported open-reference or inclusive reference. More semantic-based fieldwork is required to understand what is going on, and until we have a clearer picture, it's best not to deal with open-reference or inclusive reference. For the anaphoric relation, identity and non-identity suffice.

4.3.4 Situation indeterminacy

One of the issues that concern the use of situations in semantics is indeterminacy. How can we actually tell where one situation begins and another ends? This problem seems important for the theory of switch-reference presented here, be-

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[16] I say 'so-called' because the VP-conjunct actually contains an extended verbal projection, as it does in English; the second conjunct in *John fell abruptly and is nursing his sore back* is at least an AspP.

[17] The examples Pittman provides with *-ti-* are all intransitive statives. I do not know whether their stativity is a coincidence.

[18] Pittman derives switch-reference by adopting Finer's mechanism of index transmission via Spec-head agreement— the *T* head acquires the subject's variable via index transmission. We saw the syntactic problems with this mechanism in section 2.4.2, and its semantic impossibility in 4.1.3.3. These are problems for any theory of switch-reference reliant on T°.

cause it depends in large part on situation identity. However, the problem is not by any means restricted to situations. In fact, indeterminacy is such a part of natural language that it ought to have effects in the theory, rather than being explained away.

In chapter 3 I showed that locations, times, and events do not suffice as pivots. Even if they did, indeterminacy would be a problem with them, too. Take, for instance, a location. Some locations are neatly defined, like political entities with delineated borders, or rooms in a building. However, some are not defined well at all. Take for instance, the Grand Canyon. If you say *I've been to the Grand Canyon*, it is true if you were hiking at its base, strolling along its rim, climbing a bluff next to it, flying over it in a tour, looking at it from the next mountain over, driving through the national park around it, etc. What counts as the Grand Canyon? Is there an exact limit?

The problem is even more acute with location-sensitive grammatical expressions, like deictics, that are purely context-sensitive. How close to the speaker can *here* refer to? Is it the distance that's vague, or the location of the speaker? If I say *come here*, it means 'move to a spot near me', but what does *near* mean? This vagueness is a problem for temporal expressions, too, as well as events.

Even individual reference suffers from indeterminacy. If I say *I touched Josie on the shoulder*, we generally accept that as true even if her shoulders were covered. Does *Josie* include her clothes, then? If I talk about the Super Bowl, is that just the game itself, or what's going on on the sidelines? In the stands? On the TV broadcast? The halftime show? This particular kind of indeterminacy is an issue for situations as well Zweig (2007), but it is not more of an issue for them than it is for individuals.

It applies to properties, as well. The truth-conditions of many properties are rather ineffable, and that causes no impediment to the use of language. It might

pose a problem in philosophy or law, where clear-cut conditions are usually required.[19] However, indeterminacy and vagueness are pervasive features of natural language. Any attempt to understand natural language will eventually hit a point of granularity where we cannot be completely certain about the boundaries between two objects. It seems that indeterminacy is an ordinary by-product of a natural cognitive system, but it does not prevent us from a better understanding the nature of that system.

4.3.5 Summary

To summarize, the proposal for pivot selection and the anaphoric relation makes several predictions that evidence confirms or supports. It predicts the configuration effect on pivot type, it predicts height-related properties of pivots, and it predicts the observed values of switch-reference. At the same time, this proposal leaves some room for purported variations in switch-reference systems. Once those variations can be tested and determined with certainty, this proposal can be tweaked to account for them without reducing its explanatory adequacy.

4.4 Anti-pivot selection

Now that we have established the nature of the SR° morpheme, how pivots are selected, and how they are related to anti-pivots, we will turn to the selection of anti-pivots. Like pivot selection, anti-pivot selection is indirect— the anti-pivot

[19] A classic example of ineffability in natural language came in the Supreme Court case *Jacobellis v. Ohio*, which overturned a ruling that a film that was obscene. Justice Stewart Potter famously wrote about the limits of knowing the truth-conditions of a property, in this case, the definition of 'pornography':

> I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description [of pornography], and perhaps I could never succeed in intelligibly doing so. But I know it when I see it, and the motion picture involved in this case is not that.
>
> (Potter 1964)

argument is not directly referential, but is bound by an operator, creating a property that will be saturated by the eventual anti-pivot. Thus, anti-pivot selection relies on the binding mechanism and adjunction.

To summarize, anti-pivot selection has five basic steps, the first of which we saw in the previous section.

1. The SR° bears an index feature that introduces a variable into the switch-reference relation.
2. The C° head is co-indexed with this variable, creating a binding structure.
3. This creates a semantic property.
4. The property adjoins to the anti-pivot clause
5. Whatever saturates this property is the anti-pivot.

This mechanism works for both coordinating and subordinating configurations. There is a slight variation between configurations due to the adjunction sites, so I will describe the mechanism first for coordination and situation anti-pivots, then for subordination and entity anti-pivots.

What I propose with this anti-pivot selection mechanism will involve the second way: SR° introduces a pronoun, which is bound by C° in the case of embedded clauses, and B°, the coordinating head, in the case of coordination.

The rest of this section will discuss this proposal, with a discussion about why I do not propose the first way. I will begin with situation anti-pivots, then entity anti-pivots.

4.4.1 Selecting situation anti-pivots

Switch-reference in Kiowa tracks situations when it is found with sentential coordination. This discussion will be based on the example in (206). The DS marking signals different topic situations, to which I arbitrarily assign the indices 1 and 2.

(206) John hébà **nàu** Sam èm kīfàu.

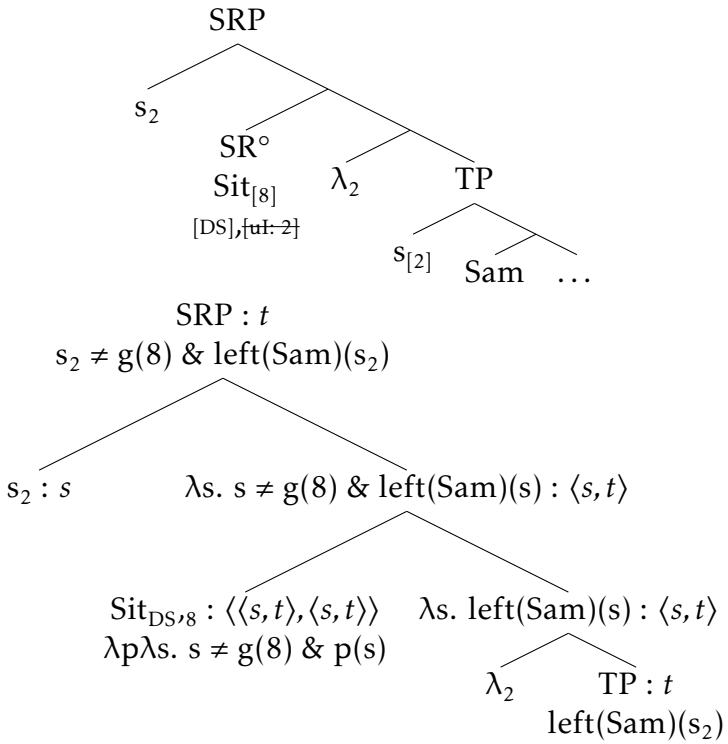
J. ∅– hé꞉ba nɔ̃ S. ʔɛ̃m– kʰĭ꞉pɔ꞉

s_1 J. [3s] enter:PF and.DS s_2 [3s:rfl] leave:PF

's_1 John entered and DS s_2 Sam left.'

We start with the construction of the pivot clause. The SR° head in the pivot clause bears an index feature; let's use [8]. It acquires the index of the situation variable ([2]) via feature valuation of its unvalued index feature [uI:__]. After the topic situation pivot is merged at [Spec, SRP], we have the pivot clause in (207).[20]

(207)



Now we can proceed to the process of anti-pivot selection.

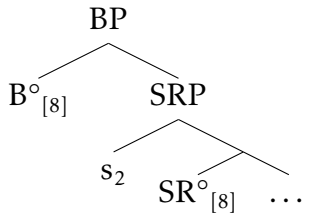
1. This SRP is then the input to the sentential coordinator *nàu*. After Munn (1993), I will consider this coordinator to be of category B°. It takes the second conjunct as its complement, and the BP adjoins within the first conjunct. Semantically, a conjunction conjoins two items of the same semantic type. Sentential coordination

[20] Again, I use a simplified *v*P for the pivot clause.

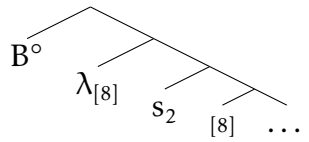
conjoins two propositions, which in a situation semantics are of type $\langle s,t\rangle$. Thus, the version of *and* that is relevant to us has the denotation in (208).

(208) $[\![\text{and}]\!] = \lambda p \lambda q \lambda s.\ p(s) \,\&\, q(s) : \langle\langle s,t\rangle,\langle\langle s,t\rangle,\langle s,t\rangle\rangle\rangle$

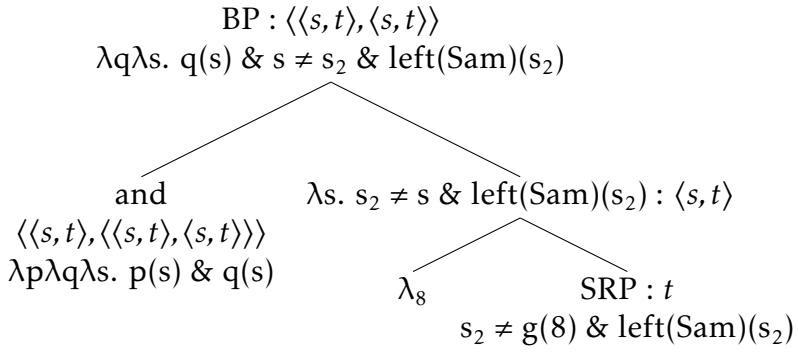
2. If *and* takes a proposition as its first argument, something needs to happen so that the SRP is of the right type. Since the second conjunct needs to become a property of the topic situation in the first conjunct, binding of a situation variable needs to take place. Thus, we re-employ the binding mechanism used earlier. The B° head is coindexed with the pronoun introduced by SR°.



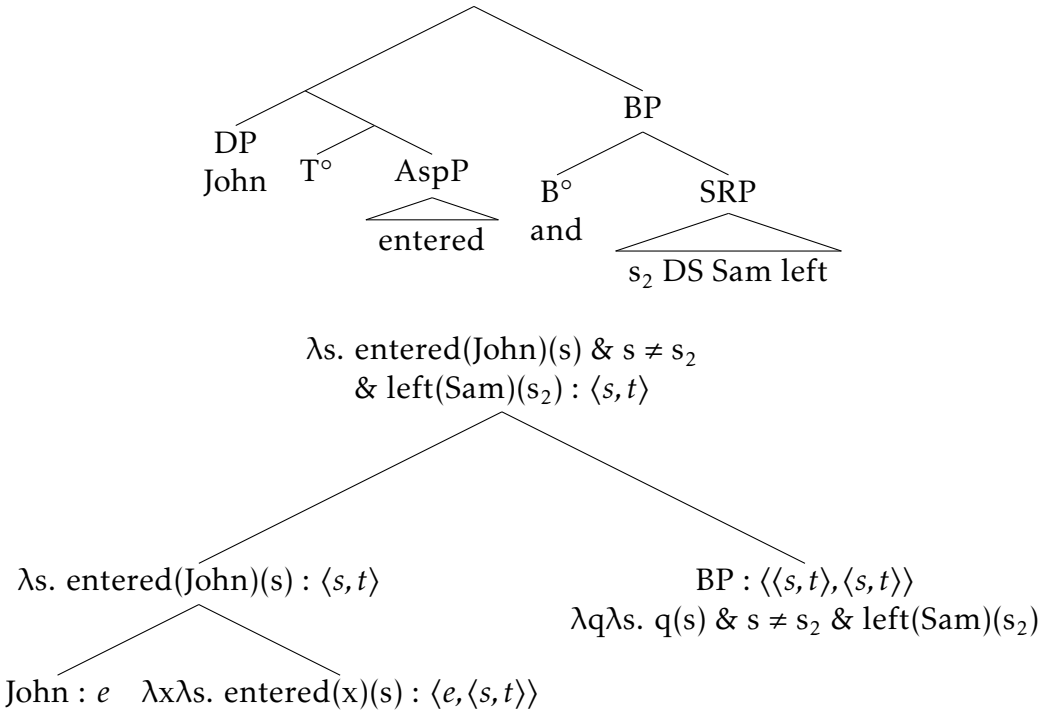
3. This co-indexation, combined with c-command, creates a binding structure. The higher index is interpreted as a λ-operator that binds the lower index, which is interpreted as a variable. The operator is parsed as adjoining to SRP.



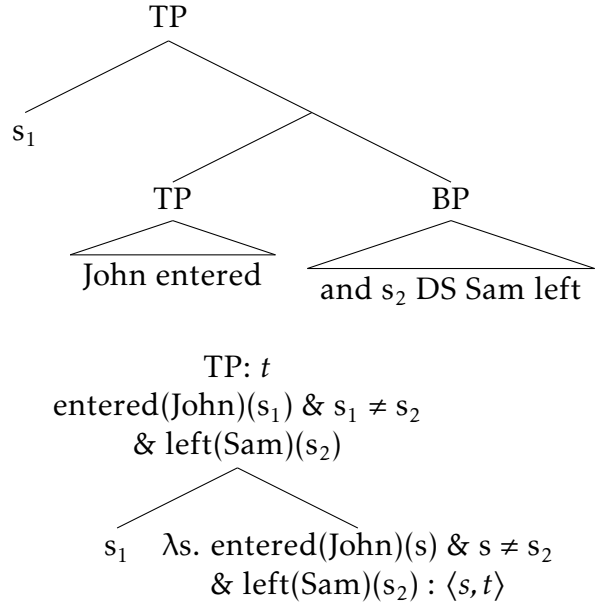
4. This binding corresponds to Predicate Abstraction, which creates a proposition, a property of situations. Informally speaking, it creates a property of anti-pivots. This proposition then composes as the first argument of the conjunction.



5. The BP then adjoins to the matrix TP, below the insertion site of the first conjunct's topic situation.



6. Finally, the topic situation of the first conjunct is inserted, completing the composition.



A curious consequence of this account is that it derives the selection of anti-pivots in a way that doesn't involve any selection mechanism. What it does is provide a semantic definition of the anti-pivot: The anti-pivot is the object that saturates the argument resulting from the binding of the variable introduced by SR°. However, the argument does not itself force any particular object to saturate it. Thus, this account raises an important question: How can we be certain that the anti-pivot works out to be the topic situation?

We can derive restrictions on anti-pivots quite simply, through the nature of the clause juncture. Sentential coordination conjoins two propositions, so it must take two arguments of the same semantic type. The input to B° is a proposition, so the BP can only adjoin at some point in the structure of type $\langle s, t \rangle$. This could be any maximal projection above Asp°. If the adjunction takes place at any of these sites, the anti-pivot will be the topic situation, since no other situation argument will enter the clause.

To ensure that the topic situation is the anti-pivot, we have to rule out adjunctions that might select other situations. For instance, if the BP adjoins to a VP of type $\langle s, t \rangle$, the situation argument introduced by SR° would be bound by the existential operator introduced by Asp°. This does not happen, though; the semantics prevents low adjunction of a SR-marked BP. The second conjunct is not within the scope of that aspectual head, nor the other inflectional heads above it (notably negation). The syntax also prevents low adjunction. While a strong coordinate structure constraint (Ross 1967) is no longer tenable, it is clear that coordination brings together like elements that are interpreted with respect to similar types of objects (Munn 1993; Johannessen 1998; Kehler 2002; Haspelmath 2004; Dalrymple & Nikolaeva 2006; Zhang 2010). Essentially, if the second conjunct contains a complete inflectional layer, the first conjunct should as well, to the extent allowed by the semantic composition. Thus, the second conjunct must adjoin as high as

possible to get the right interpretation. As a result, the argument introduced by binding the variable introduced by SR° will always be saturated by the topic situation. That is, the anti-pivot of a coordinate structure will always be the topic situation.

4.4.2 Selecting entity anti-pivots

Entity pivots are selected any time switch-reference is found in intensional clauses, which lack an indexed topic situation pronoun for SR° to select. Entity anti-pivots are selected in the same indirect manner as situation anti-pivots. The SR relation on Ent introduces an anti-pivot variable. The complementizer is co-indexed with this variable. This creates a binding structure, which results in a property that is adjoined to the dominant clause. The location of this adjunction determines the anti-pivot, since the first item that saturates the property will be the anti-pivot.

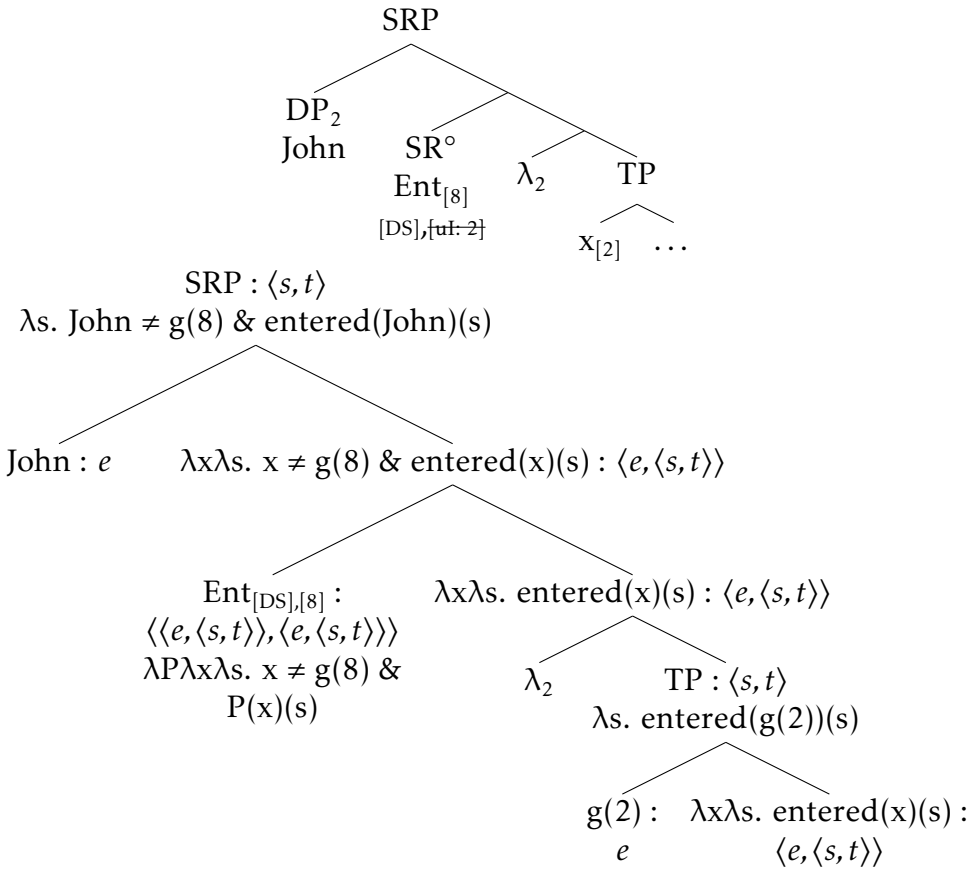
This discussion will be based on the example in (209). The DS marking signals different subjects, to which I arbitrarily assign the indices 1 and 2. I assign the index 3 to the matrix topic situation, though it will not play a significant role in this example.

(209)		Sam	èm	kí̱fȁu	[John	hḗbàȅ̱]
		S	ʔẽm–	kʰĩ́ːpɔː	J.	∅– héːba=ẽː
	s_3	S.	[3s:rfl]	leave:PF	J.	[3s] enter:PF=when.DS

‘Sam_1 left when John_2 entered.’ (f.n.)

We start with the construction of the pivot clause. The SR° head in the pivot clause, Ent, bears an index feature (let’s use [8]). It acquires the index of the subject variable ([2]) via feature valuation of its unvalued index feature [uI:__]. After the subject pivot is merged at [Spec, SRP], we have the pivot clause in (210).

(210)



Now we can proceed to the process of anti-pivot selection. As before, the anti-pivot is not truly selected. Instead, the 'selection' depends on the adjunction site of the SR-marked clause. Here are the steps for anti-pivot selection.

1. The SRP is the input to the connective *ch̲è/è*, translated as *when*. I assume that *ch̲è/è* is of category C°, and takes the SRP as its complement.[21]

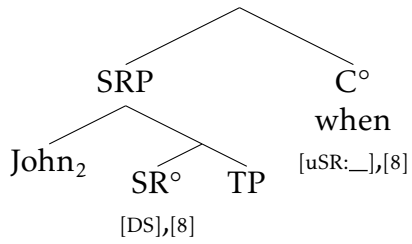
The semantics of *=ch̲è/è* is essentially that of 'when'; it links two situations by a relation of temporal proximity (WHEN(s')(s)). This relation explains the temporal closeness of the two situations, and derives matching effects (Rothstein 1995; Vikner 2004; Hinterwimmer 2010) in the same way that *at* derives matching effects through spatial proximity.

[21] This assumption contradicts the claim made in section 1.5.3 that C° is left-headed in Kiowa. This claim is based on the observation that yes/no question particles are sentence-initial. However, Kiowa has many projections with operators to the left and corresponding heads to the right, and perhaps CP is one of them. Perhaps, then, the yes/no question particles are in [Spec, CP], and the complementizer is at the right edge: [$_{CP}$ Q [TP C°]]

When takes a proposition, and returns a property of situations that are temporally proximal to the unique situation (in some domain) that describes the proposition. I use the ι operator to express uniqueness, and D to describe a function getting us from the situation to the domain (cf. von Fintel (1994)).[22]

(211) $[\![\text{when}]\!] = \lambda p \lambda s.\ \text{WHEN}(\iota s'.\ D(s') \ \&\ p(s'))(s) : \langle\langle s,t\rangle,\langle s,t\rangle\rangle$

2. Kiowa *when* bears an unvalued SR feature [uSR: __], which is valued by the [DS] feature on SR°. Through the Agree mechanism, C° acquires the DS feature, which is spelled out as DS marking. As we saw with coordination, the Agree mechanism only works if the heads are co-indexed. As a result, C° also bears the index feature [8].

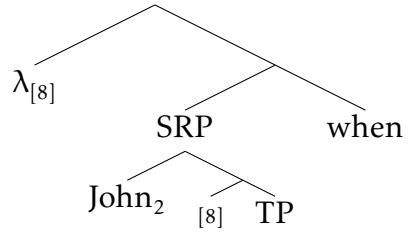


3. This co-indexation, coupled with c-command, creates a syntactic binding structure that corresponds to a semantic binding structure. The higher index is interpreted as a λ-binder of the lower index.

4. However, this λ-binder is not interpreted as adjoined to the SRP. Instead, it is parsed above the complementizer.

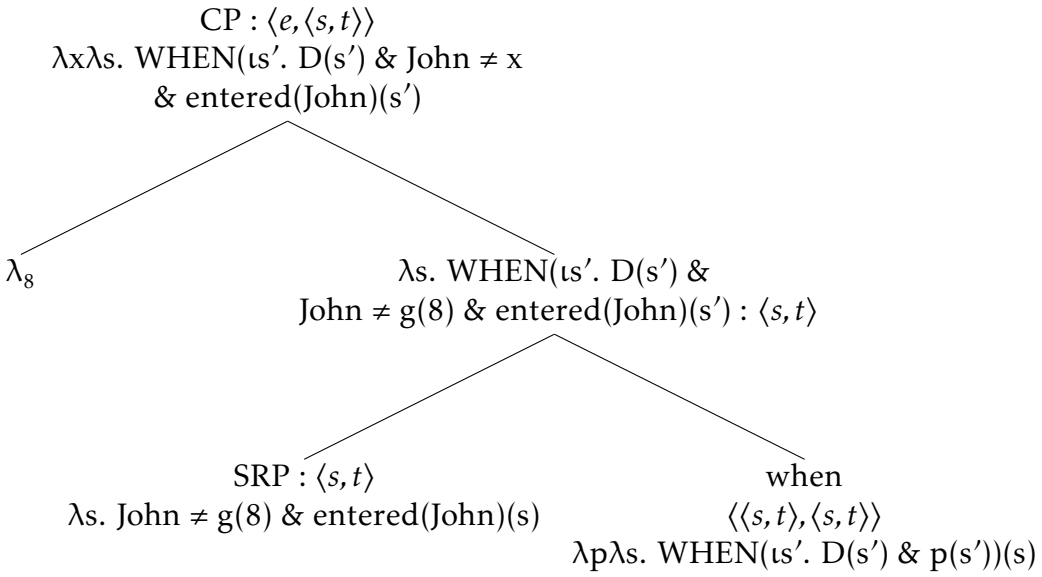
---

[22]The denotation in (211) is grossly simplified. The domain restriction function is contextually supplied but not further specified. Also, I make no mention of exemplification (Kratzer 2007), which ensures that the situation bound by the ι-operator is truly unique. These issues are crucial to a full analysis of *when*-clauses, but they are not crucial to this discussion, so I abstract away from them.

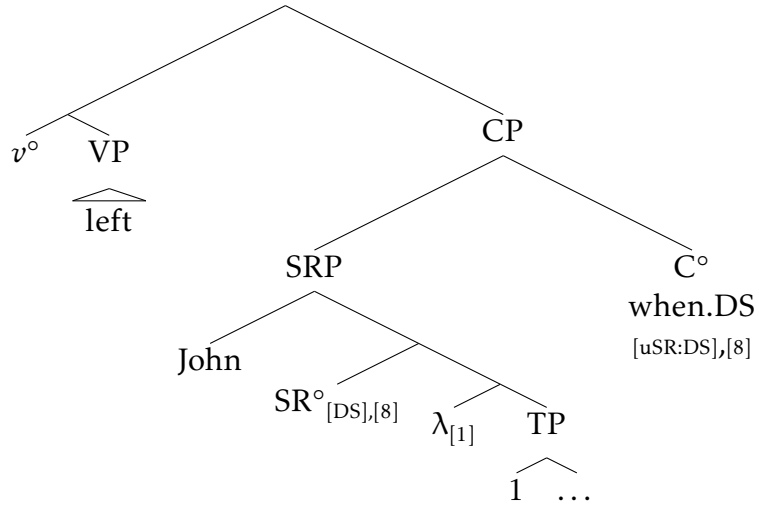


Why does the binder get parsed above the binding head in this case, but not in the others we have seen? Essentially, because it cannot get interpreted otherwise. This is not an *ad hoc* claim, though. I propose that indices are subject to a constraint of 'earliest interpretation'. In the case of the index on the coordinator s B°, interpreting it as a binder over the argument of B° is possible, since it creates a proposition, and B°'s first argument is a proposition. In the case of the (anti-pivot) index introduced with SR°, it cannot be interpreted as a binder over the TP, since the result of the wrong type. However, it can be interpreted with the head as a variable, so it is.

The index on C°, however, cannot be interpreted as a binder adjoining beneath the head. If it were interpreted as adjoining to SRP, it would create a relation, which would be of the wrong type as an input to *when*. It cannot be interpreted as a variable at C°, since there is no argument for it in the meaning of *when*. Thus, it must be interpreted as a binder above C°, after the composition of *when*. The semantics of the *when*-clause in (209) would be as follows (translated into English for clarity)



5. The SR-marked *when*-clause adjoins to the matrix *v*P, below the insertion site of the matrix subject. Both branches are of the same type, so they compose semantically by Predicate Conjunction.

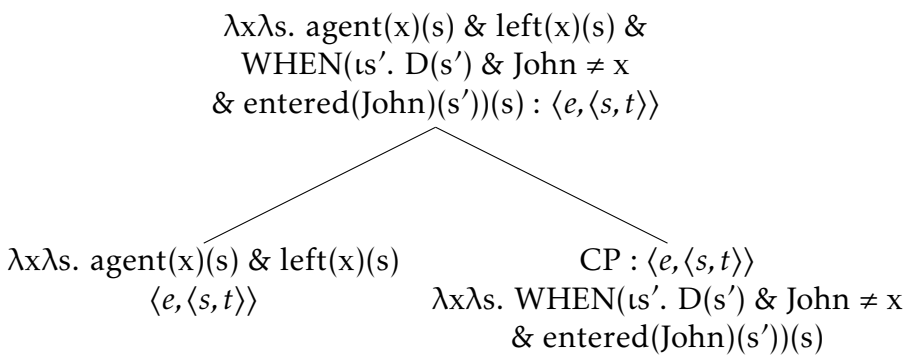


I assume that v° selects for an external argument, and in this case is agentive, introducing an agent relation (Kratzer 1996). It combines with the VP (of type $\langle s,t\rangle$) by Event Identification (212b) .[23]

(212) a. $[\![v^\circ]\!] = \lambda x \lambda s.\ \text{agent}(x)(s) : \langle e, \langle s, t\rangle\rangle$

[23] I have replaced events with situations.

b. $[\![v^{\circ}\ P_{\text{VP}}]\!] = \lambda x \lambda s.\ \text{agent}(x)(s)\ \&\ P(x)(s) : \langle e, \langle s, t \rangle \rangle$



6. As before, the anti-pivot is the object that saturates the property created by binding the anti-pivot index.

This structure derives the fact that the anti-pivot of switch-reference on an adverbial clause is always the subject. Switch-reference has made the CP a relation rather than a simple proposition, and this restricts its adjunction sites. It is of type $\langle e, \langle s, t \rangle \rangle$. For Predicate Modification to apply, it can only adjoin to a node of type $\langle e, \langle s, t \rangle \rangle$. If the verb is intransitive, the only adjunction site is at *v*P. If the verb is transitive, it is of type $\langle e, \langle s, t \rangle \rangle$. However, the syntax does not permit adjunction between a verb and its complement object, which would saturate the entity argument. Any adjunction site higher than *v*P would not be possible for the semantics of the adverbial clause to have the interpretations it is observed to have.

Thus, the anti-pivot of a *when*-clause will always be whatever fills the [Spec, *v*P] position of the clause dominating it. All subjects are either base-generated here or pass through here (as passive or unaccusative subjects). Thus, the anti-pivot will always be the subject. Through a combination of semantic composition rules and syntactic constraints, this structure derives subject-tracking without literal subject-tracking.

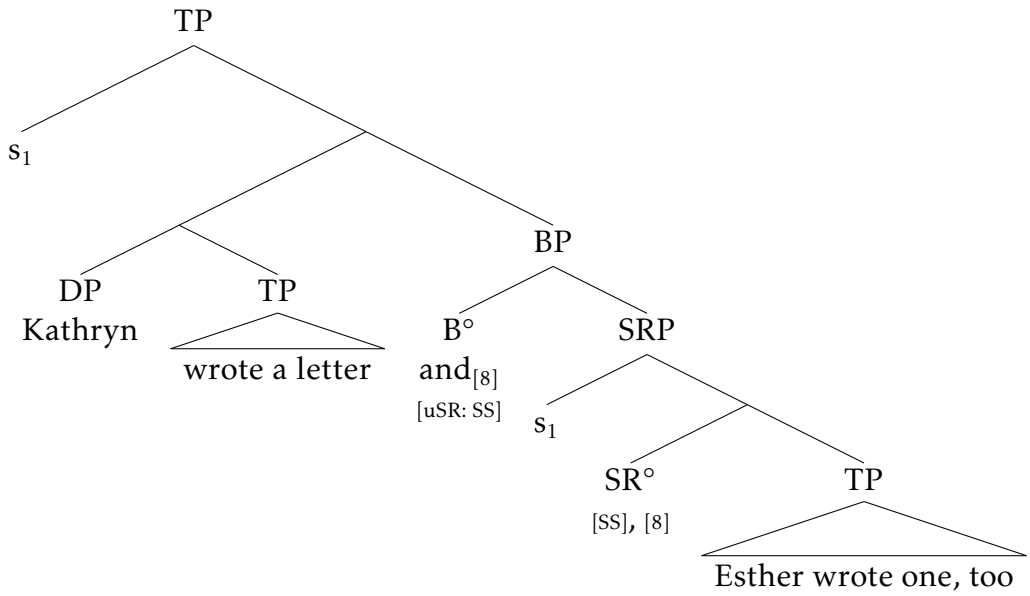
To summarize anti-pivot selection:

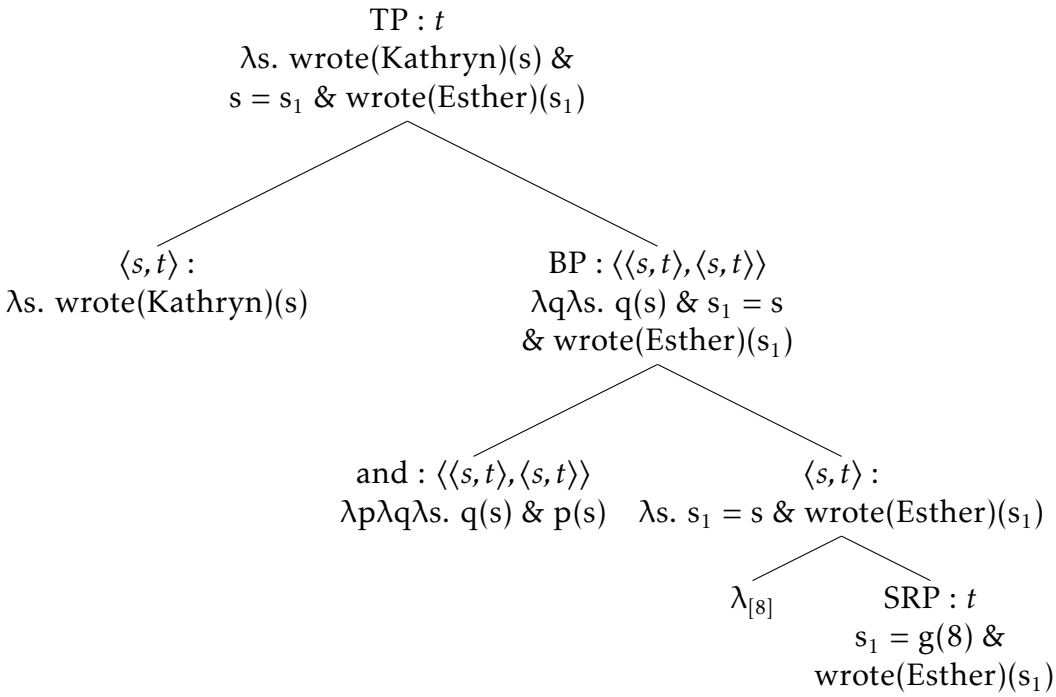
1. The SR° head introduces a variable.
2. This variable is bound by the connective (~ $\overline{\text{A}}$-binding).
3. The binding creates a property that combines with the meaning of the head.
4. This property adjoins to the dominant clause.
5. The argument that saturates this clause is the anti-pivot.

4.4.3 Anti-pivot selection with SS marking

The mechanism for anti-pivot selection is not affected by the presence of SS marking, as the following examples show. (190) involves situation-tracking. The SRP is from earlier.

(190) Kathryn gà gút gàu Estheràl gà gút
∅ K. gʲæ– gú? [gɔ ∅ E.-al gʲæ– gú?]
s_1 K. [3s:3p]– write.PF and.SS s_1 E.-also [3s:3p]– write.PF
's_1 Kathryn wrote a letter and s_1 Esther wrote one too' (f.n.)





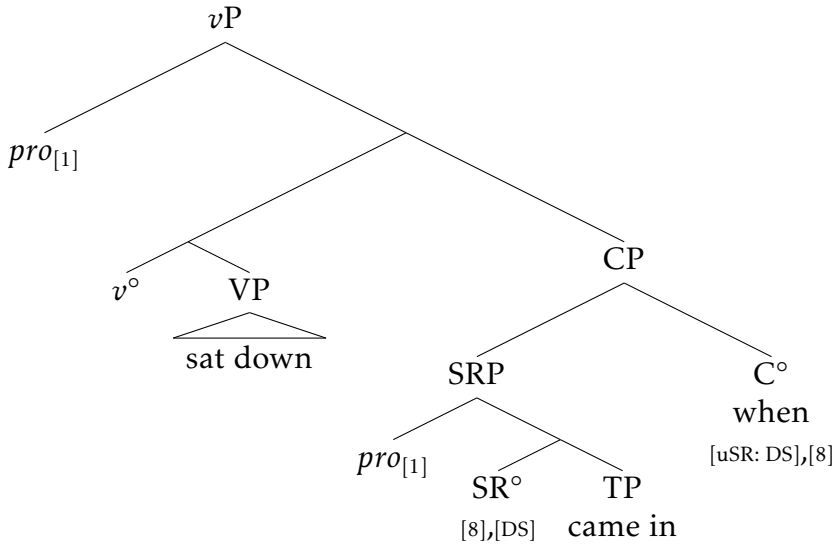
Example (213) involves entity-tracking and SS marking. This is nearly the same clause as in (191); the details of the SRP can be found there.

(213) Èm sáu hébà**chè**

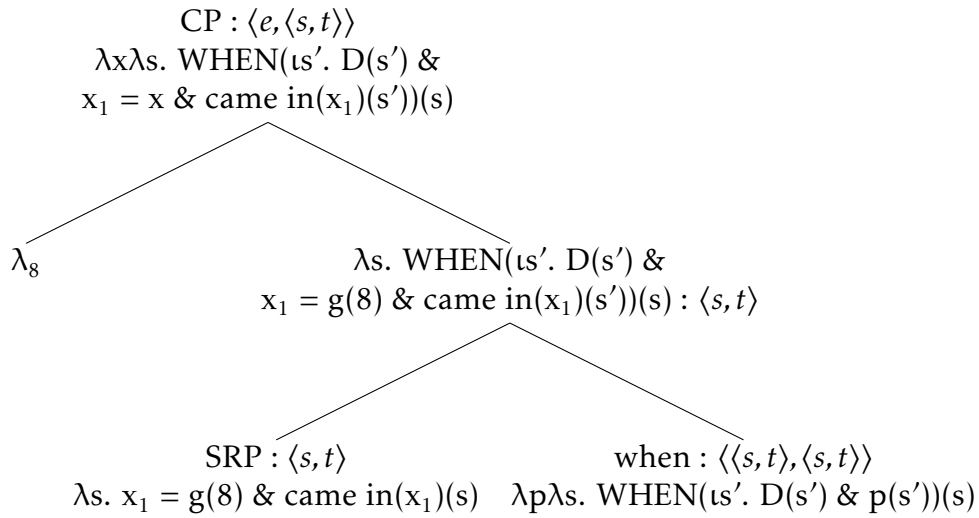
ẽm– sɔ́: [∅– hé:bà=tsẽ:]

[3s:RFL]– sit down.PF [3s]– enter.PF=**when.SS**

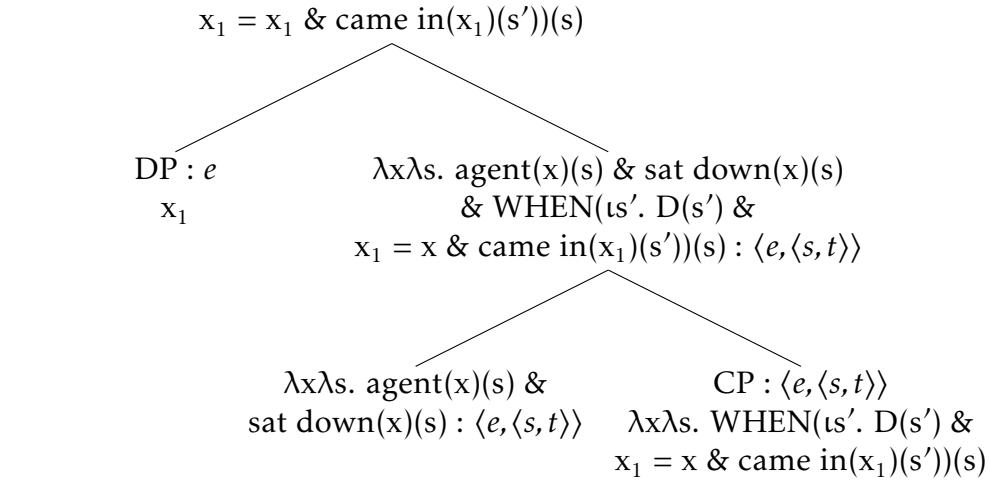
'She$_1$ sat down when she$_1$ came in.' (f.n.)



Here is the semantic composition of the CP:



The CP then adjoins to *v*P, and the subject merges as the anti-pivot:



4.4.4 Recursion

An important property of switch-reference is that it is recursive. Narratives often contain long sequences of SR-marked clauses, and Finer (1984) showed that an embedded clause's anti-pivot is its immediately dominating clause. Thus, any

theory of switch-reference ought to work recursively. In this subsection I will show that the mechanisms proposed for pivot and anti-pivot selection work recursively. As a demonstration I will provide a Kiowa example with situation-tracking. I could not elicit recursively-embedded adverbial clauses, but these are recursive as well.

The following example demonstrates the recursivity of switch-reference with coordinating conjunctions. The sequence (214) is slightly adapted from a story about the Cutthroat Massacre of 1833.

(214) Jógúl fá cául é hòlhèl **nàu** Gùsâuzèbàut é
young man one buffalo [3d:3s] kill.PF-EVID and.DS Osage+arrow [3s]
a̲dòdè **nàu** hégáu fénhe̲ cául é
bear.IMPF.EVID and.DS then butcher+without buffalo [3d:3s]
tòdèhèl **gàu** tấuchò jòfégù én qòmvàdààihèl.
abandon.PF-EVID and.SS this way homeward [3d] take flight.PF-EVID
'The two young men killed a buffalo and it had an Osage arrow in it, and they left the buffalo there without butchering it, and fled back home.' (Cutthroat Massacre, ms.)

Let's focus on the first three clauses, which demonstrate the recursion. Since we have DS marking, each clause has a different topic situation from the next. Thus, I assign them situations s_1, s_2, and s_3. The third clause may have the same topic situation as the first, so s_3 may be s_1, but I will stick with s_3 for this discussion.

conj	SR	top. sit.	clause
		s_1	two young men killed a buffalo
and	DS	s_2	it bore an Osage arrow
and	DS	s_3	they abandoned the buffalo without butchering (it)

Table 4.1. Schema of a string of SR clauses

For the purposes of clarity, I will abbreviate the clauses. Since the only relevant argument is the topic situation, the clauses will become as follows:

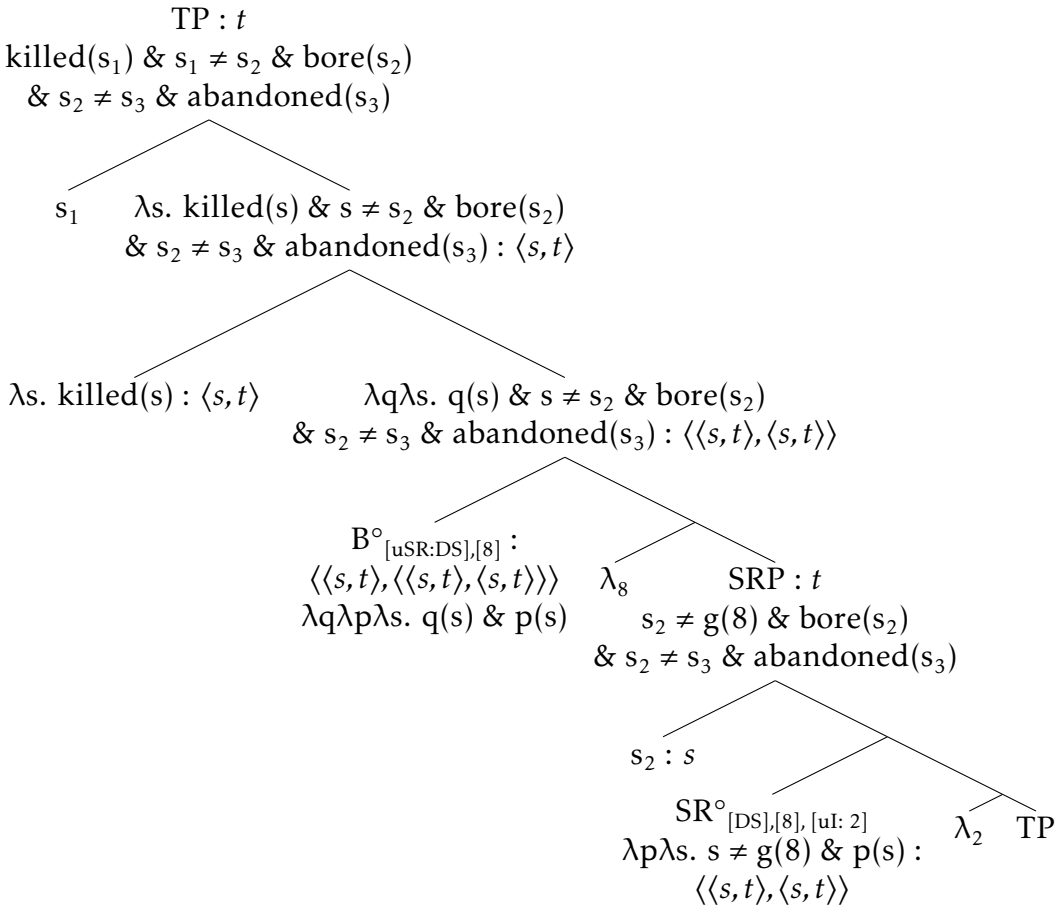
conj	SR	top. sit.	clause
		s_1	killed
and	DS	s_2	bore
and	DS	s_3	abandoned

The second and third clauses conjoin as we saw in sections 4.2.3 and 4.4.1. The result is in (215):

(215) a. $[_{TP}\ s_2$ bore $[_{BP}$ and DS s_3 abandoned $]\ ]$

b. $[\![\ TP\ ]\!] = \text{bore}(s_2)\ \&\ s_2 \neq s_3\ \&\ \text{abandoned}(s_3) : t$

This clause then undergoes switch-reference, leading to an SRP that is connected by another BP.



This process can keep repeating, as predicted. It also works for entity pivots as well, though in the interests of time I will not explicitly spell that process out.

4.5 Consequences from anti-pivot selection

The mechanism for anti-pivot selection accounts for the distribution of anti-pivots and the effect of clause types on that distribution. However, it raises a few issues that need to be addressed. The first concerns the interpretation of *when*-clauses that are located outside the *v*P. The second concerns the fact that not all anti-pivots are pivots. The third addresses the issue of anaphoric anti-pivot selection.

4.5.1 Dislocated *when*-clauses

Under the present account, *when*-clauses must adjoin to *v*P. However, they are often found (and interpreted) much higher in the structure. In (216), for instance, we need to adjoin the CP to something of type $\langle e, st \rangle$, but the subject argument is already saturated. There has to be a representation of the anti-pivot somewhere below v° for the SR to be interpreted properly.

(216) $[_{CP}$ When DS John entered], Bill v° left

To account for this, we can turn to a solution offered by Moulton (2009) for a similar problem with complement clauses (217). Moulton shows that these clauses do not move, so they cannot reconstruct. However, they still need to be interpreted low for binding purposes.

(217) $[_{CP}$ That he_1'll end up looking like his father] doesn't seem to any young man_1 to be very likely __. (p. 91)

His solution relies on the semantics of *de re* ascription. The attitude predicate takes among is arguments a *res* argument (Chierchia 1989; Percus & Sauerland 2003). The *res* of any attitude is the object to which the attitude ascribes a description. In (218), the *res* is John. The belief can be said to be about him; indeed the *res* can be expressed overtly.

(218) Mary said (x_1) that he_1 likes fish.

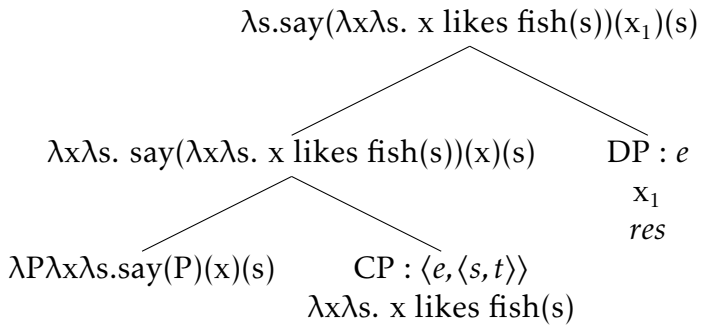
(219) Mary said about $John_1$ that he_1 likes fish.

For this ascription to work, the CP must express a property, rather than a proposition. Thus, the C° head bears an index, which binds a variable inside the CP (an $\overline{A}$-binding structure).

(220) $[_{CP}\ \lambda_1$ [λs. he_1 likes fish (s)]] = λxλs. x likes fish (s)

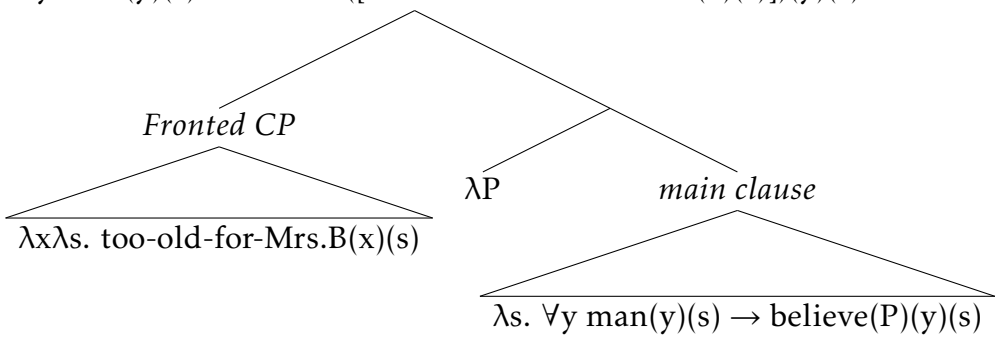
This property CP is an argument of the attitude predicate, which applies it to the *res*.

(221)



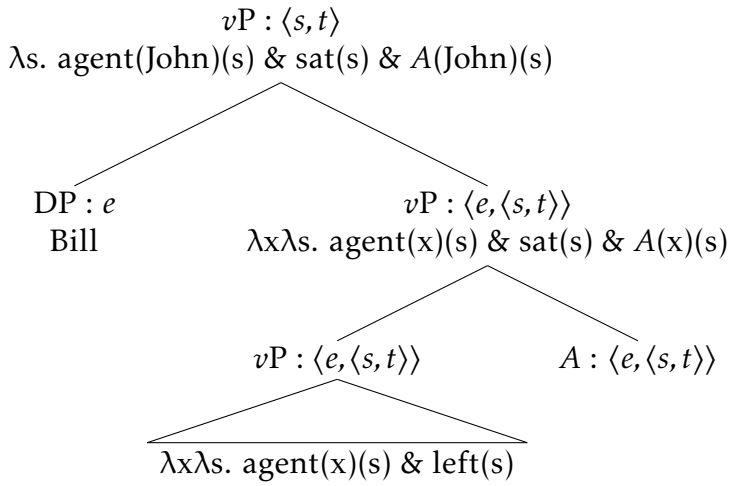
That is how CPs work at their base site. To account for left-dislocated CPs, Moulton proposes that the property argument is replaced by a variable (P) of type $\langle e, \langle s, t \rangle \rangle$. Below the CP's high insertion site, a λ-operator binds this variable. The fronted CP is inserted afterwards, and is thus applied 'low', despite being high (p. 109).

(222) [$_{CP}$ That he$_1$ might be too old to WORK for Mrs. Brown$_2$], I don't think she$_2$ would want any man$_1$ to accept.



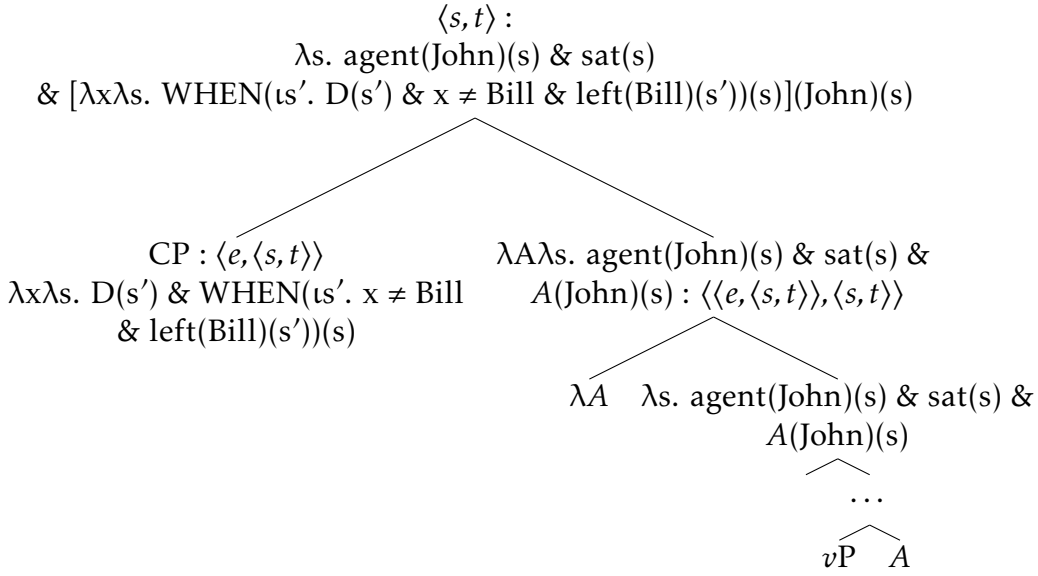
This solution applies to *when*-clauses just as easily. The switch-reference clause is already a property of the anti-pivot. We can replace the entire CP with a variable. Let's call this variable *A* (for adjunct). It is of type $\langle e, \langle s, t \rangle \rangle$. Thus, it combines by Predicate Modification. This tree then composes normally. When the subject is merged, it saturates the entity argument for *A*.

(216) [$_{CP}$ When DS John entered], Bill left.



At the point where the CP is inserted, a λ-operator binds A.

(223)



If we convert the root clause, the expression comes to mean (224), the desired result.

(224) $[\![(223)]\!]$ = λs. agent(John)(s) & sat(s) & WHEN(ιs′. D(s′) & John ≠ Bill & left(Bill)(s′))(s) : $\langle s,t\rangle$

4.5.2 Pivots aren't always anti-pivots

One important observation that Jacobsen (1967) made about switch-reference is that the pivot of one SR morpheme serves as the anti-pivot of an SR morpheme

embedded under it, and that the anti-pivot of an embedded SR morpheme serves as the pivot of an SR morpheme in its own clause. This effect is visible when several clauses are linked by SR morphemes. In (225), the subject[24] of the third clause is *pro*, but DS marking indicates a change from the subject before it. It may co-refer with the first sentence's subject, or it might refer to another person altogether. In (225), the second clause is the pivot clause of the first SR marker, as well as the anti-pivot clause of the second.

(225) Yísàum hébàhèl **nàu** dónhêl **nàu**

jí:sɔ̃m ∅– hé:b-a-hel nɔ̃ ∅– dɔ́n-hêl nɔ̃ ∅–

Y. [3s] enter-PF-EVID and.DS [3s:3s] look at.PF-EVID and.DS [3s:3s]

jɔ́nê…

tɔ́:-nɛ̂:

say.IMPF.EVID

'Yisaum$_1$ came in and he$_{*1/2}$ looked at him and he$_{1/*2/3}$ said…'

This property of pivots appears so evident that it might seem barely worth mention. However, it does not follow from the configurational hypothesis that I successfully tested in Chapter 3. In fact, from that hypothesis, it follows that in certain configurations, the anti-pivot cannot be the pivot of its own clause.

In particular, if a conjoined clause contains a *when*-clause, like in (226) the anti-pivot of the SR morpheme in the *when*-clause is the conjoined clause's subject, but the pivot of the SR morpheme of the conjoined clause is the topic situation.

[24]As I point out in my other sample, SR on coordination can look to be subject-tracking if the topic situations co-extend with the subjects, and suggested that this was common in narratives where no question is under discussion.

(226) À chō̲chàn, **gìgáu** dè kī̲fáu gàt

a– tsó̲+tsãn, gigɔ́ de– kʰí:p-'ɔ gʲàʔ–

[1s] crawl+arrive.PF and:SS:then [1s:rfl] jump up-PF [1s:3pa]

bō̲chē̲.

bó̲:=tsẽ:

see.PF=when.DS

'I snuck in, and then I ran off when I saw them.

This conclusion is not predicted by any other account of switch-reference, but it follows naturally from the account presented here. The anti-pivot of the SR morpheme *chē̲* will be the subject, but the pivot of that clause will be the topic situation. This is a welcome, though surprising, result.

4.5.3 Other non-referential subjects

This account predicts that switch-reference can handle quantificational pivots. This subsection will show that it can handle other types of non-referential targets— bound variable pivots and anti-pivots, and wh-pivots.

4.5.3.1 Bound variable subjects

If switch-reference requires some kind of reference, we might wonder how it works when its pivot is interpreted as a bound variable. As it turns out, switch-reference operates normally. The sentence in (227) has a bound variable interpretation, and SS marking appears. In (228), the DS marking is used, and the bound variable interpretation is not allowed.

(227) Háun hájél [èm gúnmáu**chē̲**] èm dáujàugù

hɔ́̃n hátél ʔẽm– gún-mɔ̃:=tsẽ: ʔẽm dɔ́:+tɔ:-gu:

NEG person/INDEF [3s:rfl] dance-IMPF=**when.SS** [3s:rfl] sing+act-NEG

'Nobody sang$_1$ while they$_1$ danced.' (f.n.)

(228)

Háun	hájél	[èm	gúnmắuè̲]	èm	dắujằugǜ
hɔ̃́n	hátél	ʔẽm–	gún-mɔ̃ː=ʔẽː	ʔẽm	dɔ́ː+tɔː-guː
NEG	person/INDEF	[3s:rfl]	dance-IMPF=**when.DS**	[3s:rfl]	sing+act-NEG

‘Nobody sang$_1$ while he/she$_2$ danced.’ (f.n.)

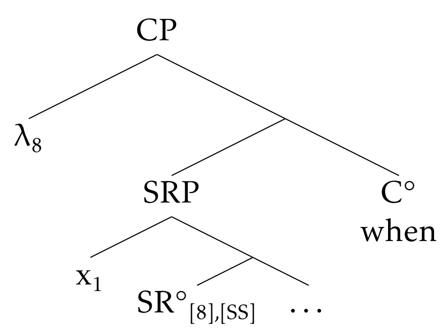
This result is predicted by the theory proposed in Chapter 4, even though neither the pivot nor the anti-pivot are referential. The bound variable is inserted as the pivot. It bears an index, so it can be bound by the higher quantified subject. Since the two subjects co-refer, SS marking is found.

(227′) [[¬∃x person(x)] λ_1 [$_{vP}$ x_1 [[.CP when x_1 SS danced] [$v°$ VP]]]]

When the pivot is not bound, it is interpreted with respect to the assignment function (i.e., it is anaphoric). DS marking is found.

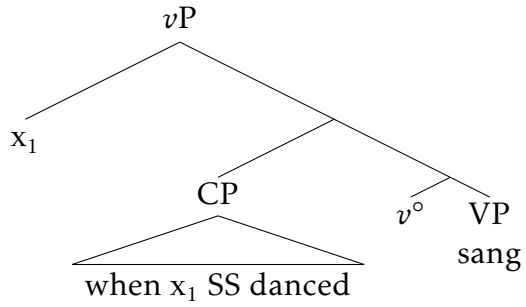
(228′) [[¬∃x person(x)] λ_1 [$_{vP}$ x_1 [[.CP when x_2 DS danced] [$v°$ VP]]]]

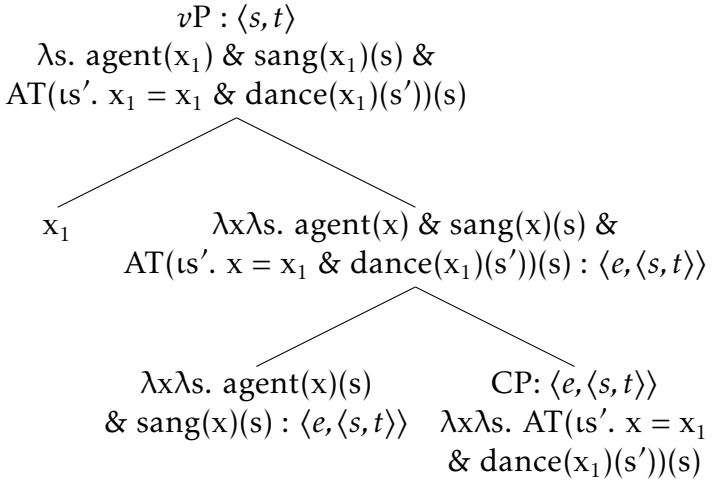
We can see how these results follow from the theory proposed in Chapter 4, by looking at the following derivation. Here is the LF of the CP, with its denotation in (229), slightly simplified:



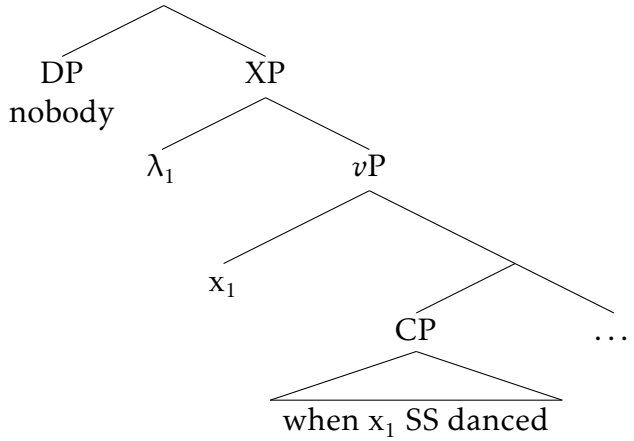
(229) ⟦ CP ⟧ = $\lambda x \lambda s.\ AT(\iota s'.\ x = x_1\ \&\ dance(x_1)(s'))(s) : \langle e, \langle s, t\rangle\rangle$

This CP is adjoined to the *v*P. The subject that saturates the anti-pivot property is the lower copy of the quantifier, which is interpreted as a variable, as shown by the corresponding semantic structure.



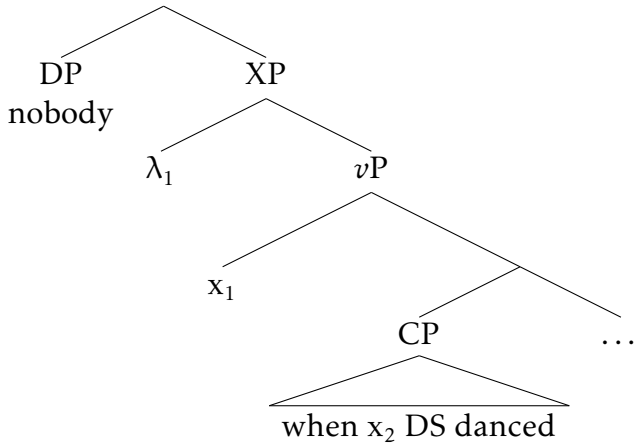


The derivation proceeds normally, then the raised quantifier merges. Since it has moved, a λ-operator adjoins to the sister of the DP. This operator binds the variable copy, and since the pivot has the same index, the operator binds it, too. The resulting projection (which I label XP below) is then the input to the quantifier.



(230) $[\![\text{XP}]\!] = \lambda x \lambda s.\ \text{agent}(x)\ \&\ \text{sang}(x)(s)\ \&\ \text{AT}(\iota s'.\ x = x\ \&\ \text{dance}(x)(s'))(s) : \langle e, \langle s, t \rangle \rangle$

In the example that lacks a bound variable interpretation, the pivot's index does not match that of the quantifier (technically, that of its binder). Thus, it is ignored, and cannot co-refer to it.



(231) $[\![\text{XP}]\!] = \lambda x \lambda s.\ \text{agent}(x)\ \&\ \text{sang}(x)(s)\ \&\ \text{AT}(\iota s'.\ x \neq x_2\ \&\ \text{dance}(x_2)(s'))(s) : \langle e, \langle s, t \rangle \rangle$

As we saw in the previous chapter, switch-reference has no problem with quantified pivots. This discussion shows that it has no problem with quantified anti-pivots, or with bound variable pivots.

4.5.3.2 Wh-subjects

Another kind of non-referential subject is the wh-subject. Switch-reference behaves as the present theory predicts it should. With coordination, SS or DS marking is available when the conjoined clauses have wh-subjects (or any wh-expressions, for that matter). As we saw in Chapter 3, the context determines whether SS or DS marking appears, since what is being tracked is the topic situation, rather than the subject. The wh-movement takes the wh-word to [Spec, CP], past the SRP projection. Thus, the wh-movement does not affect switch-reference.

(232) Hâjêl chói bấu **gàu** hâjêl chóigùl

hâːtêl tsói ∅– bɔ́ː gɔ hâːtêl tsói+gul ∅–

person\WH coffee [3s:3s] bring.PF and.SS person\WH liquid+red [3s:3s]

bấu?

bɔ́ː

bring.PF

'Who brought coffee, and who brought tea?

(233) Háundè bé bấu, gàu hágà bé sép?

hɔ́̃nde bé– bɔ́ː gɔ hágʲæ bé– sép

thing/wh [2s:3i] bring.PF, and.SS where:at [2s:3i] put/SG.PF

'What did you bring, and where did you put it? (f.n.)

With embedded clauses, switch-reference tracks subjects, even if one is a wh-expression. Wh-anti-pivots are no more a problem for this theory than any other quantificational anti-pivot; the anti-pivot is the variable copy in the [Spec, *v*P] position (234). Wh-pivots do not appear in adverbial clauses in Kiowa (235), so switch-reference is untestable with them.

(234) Hâjêl [èm gúnmấu**chè̲**] èm dấujàugù

hâːtêl ʔẽm– gún-mɔ̃ː=tsẽː ʔẽm dɔ́ː+tɔː-guː

person/WH [3s:rfl] dance-IMPF=**when.SS** [3s:rfl] sing+act-NEG

'Who$_1$ sang while they$_1$ danced?' (f.n.)

(235) *Ém kífàu [hâjêl chánè̲]?

ʔém– k^{h}íːpɔː hâːtêl ∅– tsấn=ẽː

[2s:rfl] exit.PF person/WH [3s] arrive.PF=when.DS

You left when WHO arrived? (f.n.)

4.6 Summary

This chapter has offered a new theory of switch-reference. It employs a combination of syntactic and semantic structures to derive the observations that have been made in this dissertation. In doing so, this analysis highlights the ways that the two modules of the grammar seem to work together to derive surface phenomena. The derivations also made interesting and correct predictions about other facets of switch-reference phenomena.

The theory proposed in this chapter was crafted to capture the generalizations about Kiowa, but is intended to apply cross-linguistically. In the final chapter, we will discuss some of the issues concerning other languages. We will also discuss briefly a few open questions about Kiowa switch-reference that seem to be promising.

CHAPTER 5

ISSUES OF FURTHER PURSUIT

The previous chapter introduced a theory of switch-reference that accounts for the generalizations presented earlier in this dissertation. In this final chapter will examine some additional phenomena that this theory accounts for, as well as a couple that I have not been able to completely test for so far. In section 5.1 we will look at a few unresolved issues concerning switch-reference in Kiowa. Section 5.2 will discuss issues concerning the extension of this account to what is known about other switch-reference languages. It does not offer any solid answers, in large part because what we know about these languages is limited. Finally, section 5.3 closes the dissertation with some remarks on what I hope this work has accomplished.

5.1 Further issues in Kiowa

In the previous chapter, we saw that the theory of switch-reference proposed here had many welcome consequences and verified predictions. In this section, we will look at three issues where the evidence has not revealed a certain result. These are the use of switch-reference with expletives, the restriction of anti-pivots to subjects despite high applicatives that might provide a valid adjunction site, and the mechanism that forces the SR pronoun to be bound, rather than anaphoric.

5.1.1 Expletive subjects

Another non-referential pivot to explore is the expletive. Expletives are perhaps the quintessential non-referential subject, since syntactic theory proposes

that they are meaningless constituents used solely to satisfy syntactic constraints. Since expletives by definition do not refer, we might predict that switch-reference should only treat them in one of two ways:

a) Switch-reference cannot appear, due to the identity relation requiring reference of both its arguments.
   (that is, without reference there can be no switch-reference)

b) It always appears with DS marking, since the identity relation will never be one of identity.
   (that is, without reference there can be no identity)

This prediction is wrong: Neither seem to be the case. In fact, the switch-reference facts suggest that expletives are referential. Granted, very little research has been done on the matter. Langdon & Munro (1979) provides the only study of expletives, where they find a stark preference for SS marking in Yuman languages (of California)

(236) nya-ipily-**k** hupak-mot-m
when-be hot-SS snow-NEG-TNS
'When it's hot, it doesn't snow.'

(237) nya-hupak-**m** hačur-k
when-snow-DS be cold-TNS
'When it snows, it's cold. (Mojave; Langdon & Munro 1979)

Evidence from Kiowa also suggests that expletives are referential. Expletives can trigger default 3rd-person plural agreement (238), or they can trigger 3rd-person singular agreement (239).

(238) Kídêl **gà** sál.
k^{h}ídêl g^{j}æ– sál
yesterday [3p] be hot

'Yesterday it was hot.'

(239) Mîn [ ] sôyà

m̂ı̃n ∅– sôː-ya

about to [3s] descend/SG-IMPF

'It's about to rain'[1]

What about switch-reference? The evidence suggests that weather expletives are referential. With coordination, I found a preference for SS marking in simple elicitation (240). With subordination, the preference is for DS marking, both in elicitation (241) and in texts.

(240) Gà hôjèàumgà **gàu** gà thőàumgà.

gʲa– hôːte+ʔɔ̃m-gʲa gɔ gʲa– t'óː+ʔɔ̃m-gʲa

[3p] dark+make-DETR.PF[2] and.SS [3p] cold+make-DETR.PF

'It got dark and it got cold.' (f.n.)

(241) Gà còdóthòàumdèp ḗhàuè̱ àn

gʲæ– koːdó+tʔoː+ʔɔ̃m-dep ḗːhɔ́ː=ʔẽː ãn ∅–

[3p] very much+cold+make-DETR.IMPF this:here=when.DS HAB [3s]

thólsőyà.

tʔól+soː-ya

snow+descend/SG-IMPF

'When it gets very cold here, it snows a lot.' (f.n.)

When an adverbial clause is adjoined to a matrix clause with a DP subject, DS marking is required (242).[3]

---

[1]This Kiowa example can also refer to the past (i.e., 'it was about to rain'), in a different context.

[2]Kiowa uses the detransitive form of the verb *a̱umé*, 'make, do', to express changes of state (it generally translates 'become').

[3]I did not use contexts to test for the possibility of SS marking with adverbial clauses joining two clauses with expletive subjects.

(242) a. Sépdáu**e̱** háun gûi bàt kîyàu.

∅– sép+dɔː=ẽː hn̋ gû-j bak– kʰîː-yɔː

[3s] descend+be=when.DIFF not outside-to [1pi] exit-IMPF

'When it rains we don't go outside.' (f.n.)

b. * Sépdáu**che̱** háun gûi bàt kîyáu.

If switch-reference with coordinating conjunctions tracks topic situations, we should see effects derived from the semantics of topic situations, and we do. For instance, in (243), the preferred SS marking is elicited in a context about a single day.[4]

Context:
I ask you how the weather was today.

(243) Gí̱gàu còdó+sèp+dàu **gàu** hègáu kísàujàu gà ásàuldèdàu.

gĩ́ːgɔ ∅- koːʷdó+sép+dɔː nɔ̃ hegɔ́ kʰíːsɔtɔ gʲa- ásɔːlde+dɔː

morning [3s] much+rain+be **and.SS** already afternoon [3p] drizzle+be

'This morning it rained a lot, and this afternoon it drizzled' (f.n.)

However, DS marking is easily obtained if the context is right. The adverbials in (244) refer to the recent past, in the actual world, and the future, which is not in the actual world. In a situation semantics, these different worlds are simply different (maximal) situations, and the topic situations the adverbials describe are part of these 'worlds'. Thus, the two topic situations cannot be identical, so we get DS marking.

[4]The contrast on the adverbials suggest that the two clauses describe different parts of the same day.

Context:
I ask you when a good time will be weather-wise to go for a walk. You suggest right now, with the following reason:

(244) Ḗ̲hàudèkì̲ sépdɑ̀u **nàu** kɑ̲̀hìgàu gà ásàuldèdàuthɑ̀u.
ɛ́ːhɔ-dè+kʰĩ ∅– sép+dɔː nɔ̃ kʰʲæ̃ːhigɔ gʲæ- ásɔːlde+dɔ-tˀɔː
today [3s] descend+be **and.DS** tomorrow [3p] drizzle+be-MOD
'It was raining this morning and it will drizzle tomorrow' (f.n.)

The following examples support the notion that situations are involved, rather than spatiotemporal locations. (245) shows that a contrast in spatial location is not sufficient for switch-reference, while (246) shows that temporal location is not sufficient.

(245) Ḗ̲hàu sépdɑ̀u **gàu** ɑ́uhàu gómcòt.
ɛ́ːhɔ ∅– sép+dɔː gɔ ʔɔ́ː-hɔ ∅– góm+koʔ
here [3s] descend/SG+be and.SS there [3s] wind+be strong
'It is raining here and it's windy over there.' (f.n.)

(246) Kídêl sépdɑ̀u gàu ḗ̲hàudekì̲ gómcòt.
kʰíːdêl ∅– sép+dɔː gɔ ɛ́hɔːdekʰiː ∅– góm+koʔ
yesterday [3s] descend/SG+be and.SS today [3s] wind+be strong
'It was raining yesterday and it was windy today.' (f.n.)

The notion that some expletives are referential is actually in line with a lot of recent research. For instance, several have argued for expletives referring to events or spatiotemporal locations in a variety of languages (Erteschik-Shir 1997; Felser & Rupp 2001; Jäger 2001; Carminati 2002; Kiss 1995; Devine & Stephens 2006: *inter alia*). The notion is not even new; even Chomsky (1981) suggests that weather expletives might refer.

The facts I describe above for Kiowa strongly suggest that weather expletive clauses involve a situation that restricts interpretation. However, before claiming

this with certainty, we need an understanding of how expletives work with situation semantics. Saying that the expletive involves a situation does not tell us enough, because there are multiple situations in the clause, any of which could provide the requisite spatiotemporal restriction, even if they are not referential.

If the situation in question is the topic situation, it is inserted independently of the expletive subject, which would be null (247a).[5] If there is no topic situation (say, in an intensional embedded clause), the existentially quantified-over event situation could provide enough meaning, without recourse to an expletive situation (247b). Or, there could be an 'expletive' pronoun referring to a situation (247c), inserted as an argument of the verb.

(247) It rained.

a. $[\![\ s_1 \text{ it rained }]\!] = \text{PAST}(s_1) \ \&\ \exists s'[\ s' \leq s_1 \ \&\ \text{rain}(s')\ ] : t$

b. $[\![\lambda s.\ \text{it rained } (s)]\!] = \lambda s.\ \exists s'[\ s' \leq s \ \&\ \text{rain}(s')\ ] : \langle s, t \rangle$

c. $[\![\ s_1 \text{ it}_2 \text{ rained }]\!] = \text{PAST}(s_1) \ \&\ \exists s'[\ s' \leq s_1 \ \&\ \text{rain}(s_2)(s')\ ] : t$

In addition, if the expletive refers, the predicate has to be different as well. It would either have to have a V° head of type $\langle s, \langle s, t \rangle \rangle$ or a v° head that resulted in an expression of type $\langle s, \langle s, t \rangle \rangle$. More investigation is warranted, since the result would make a difference for how we understand switch-reference with expletives. Perhaps, then, the switch-reference facts can help us better understand how expletives work. For instance, if expletives rely on the topic situation, they should not work with switch-reference in intensional clauses. If, however, expletive situations are arguments to the verb, they ought to work with any clause, but we would have to include a new SR head, that takes propositions but still tracks a situation. Further investigation ought to be quite informative.

[5] These denotations are partially simplified, to remove irrelevant details.

What about other types of expletive subjects? It isn't clear that Kiowa has any. In Kiowa, attitude complement clauses trigger plural object agreement on the verb (Watkins 1984). If we assume that attitude clauses are adjuncts that describe a pronominal argument (Koster 1978; Kiss 2002; Moulton 2009: *inter alia*), this agreement is predicted. However, objects never serve as pivots, so we would need to look at sentential subjects (which are also adjuncts), which should trigger plural subject agreement. However, Kiowa does not allow sentential subjects. Kiowa psych verbs also do not provide evidence in this regard. These have dative-marked attitude holders, which would be the highest argument in the clause, and thus the pivot.

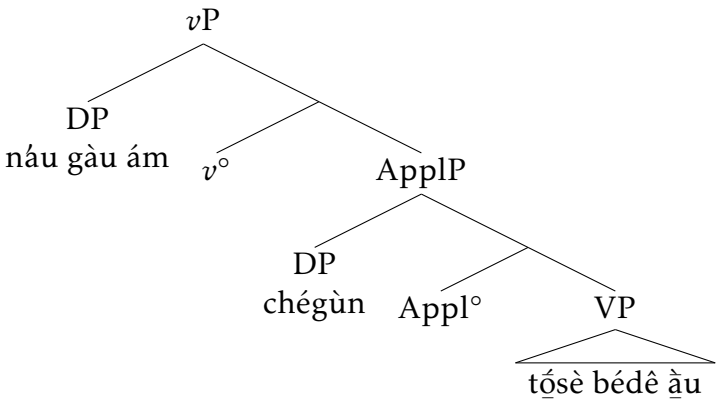
All told, expletives are an interesting phenomenon for switch-reference, and may shed some light on the nature of expletives themselves. Unfortunately, it seems that we run into practical limits trying to understand this issue by looking solely at Kiowa. Perhaps we could learn more from a switch-reference language with a wider variety of expletive constructions.

5.1.2 Other possible adjunction sites

In the previous chapter, I argued that adverbial clause CPs are restricted by the meaning added by SR to join at only one position, below [Spec, *v*P]. This restriction, which emerges from the syntax and the semantics, derives the observation that the dominant clause subject is the anti-pivot of the embedded SR marker. However, in the examples we've seen so far, there is only one place of the right semantic type inside the *v*P: right below the subject insertion site at [Spec, *v*P]. What happens, then with applicatives? The merge of Appl° to VP results in a node of type $\langle e, \langle s, t \rangle \rangle$, right below the insertion site of the applicative argument. Thus, the semantics should not prevent the CP from adjoining to ApplP. This means that the presence of an applicative might have an effect on SR marking.

Adger & Harbour (2007b) and Adger et al. (2009) argue for a high applicative projection in Kiowa, which hosts datives, benefactives, and other 'indirect objects'. This projection is situated between VP and *v*P.

(248) Hét [nầu gàu ám] **chégùn** tő̲sè bédê ầ̲u.
HORT I and you dog bones [1di:3d:3s] give.PF.IMPER
'Let's you and I give two bones to the dog. (Adger et al. 2009)



Watkins (1993) provides an example that seems to involve a dative anti-pivot. The dative-marked possessor (an applicative DP) is tracked instead of the nominative internal argument possessum (249). However, this example has SR marking with coordination, so the switch-reference is tracking the topic situation, rather than any of the nominal arguments.

(249) Góm+jā̲gá á– dā̲u-mê **gàu** ∅– báuláu+fàulè
wind+grease [∅:3s:3s] be-EVID **and.SS** [3s:3s] butter+eat:IMPF.EVID
'He had mentholatum (Mentholatum was to him) and he was eating it like butter.' (Watkins 1993)

In addition, (249) has an intransitive dative, so the applicative DP would be highest anyways. What we need is an example with a ditransitive, something like the Kiowa sentence (250). If the anti-pivot can be the applicative (his daughter), we should see that SS marking is possible.

(250) Bill gave his daughter a dog when she visited.

I suspect that DS marking is the only one allowed, but I have not tested it with contexts. If this suspicion is correct, the proposed theory has to provide some explanation. I would suspect a syntactic restriction; a category restriction on adjunction of CPs. Essentially, CPs cannot be adjoined to an ApplP.

5.1.3 Anaphoric anti-pivots

One final issue arises from the nature of the SR° head. This head introduces a variable that gets bound by the connective. But what makes it get bound? Semantically, there is no way to force it to be bound, which predicts that there should SR should be able to appear in at least some languages in matrix clauses, without a connective. However, this is never the case.[6] There must be some syntactic reason for this obligation to be bound.

As an obligatorily bound variable, the SR-pronoun is like other embedded pronouns that are bound at C°, like PRO, logophors, long-distance anaphors, etc. These too must be bound. There is no clear consensus on how to ensure so, and I admit that I have not found a solution for switch-reference. So this remains an open question.

5.2 Issues with cross-linguistic extension

The theory I proposed in Chapter 4 focused on explaining the facts of switch-reference in Kiowa, where the most study had been conducted. However, the theory is meant to apply cross-linguistically, since the generalizations that fed the

[6]Watkins (1993) discusses a couple of cases in Kiowa where a coordinated clause is used in relation to a salient situation, rather than the topic situation of the previous utterance (if there was one). This is intriguing, since it allows for the anti-pivot situation to be, say the local situation to the speaker. But this phenomenon is not quite what I am describing, since in the Kiowa case a conjunction is still required. Sentential coordination is often used this way in natural language.

desiderata of the theory are cross-linguistic. Unfortunately, the bulk of the descriptive work done on switch-reference languages is not suitable for this task, since it includes little description of syntactic structure and even less on clause-level semantics. More theory-driven elicitation with semantic fieldwork techniques is required for us to make the most applicable generalizations. However, we can get a sense of the questions that elicitation might start by asking, and this section will discuss some of those questions.

5.2.1 Recapitulative verbs

Switch-reference is found in many languages on reduced-form anaphoric pro-verbs, called *recapitulative verbs*. These verbs are often fixed forms of verbs like 'do' or 'be', and are frequently found in narration. The first clause in (251b) is an example from Creek (Muskogean, Oklahoma) of a recapitulative verb, *mo:mi-* 'it's like', whose form is fixed.[7] This verb bears SR-marking that relates to the previous matrix clause.

(251) a. ma ísti a:łati:s
that person went.about
'That person went about'

b. **mo:mi-n** ahakakáca łokáfa anati momi:hocikon ismonkatit
be like-DS law.breaker to.be.whipped they didn't do it still
ômis
it is
'Being like that, they have still not done it to the lawbreaker who was to be whipped.' (Creek, Martin (1998: 11))

[7] It is not certain whether this verb has no agreement or null 3rd-person agreement (i.e., default agreement).

The use of switch-reference recapitulative verbs has been widely attested in the Muskogean languages, in the languages of New Guinea, and elsewhere. Notably, it is found in clause-chaining environments, and it is not difficult to surmise why. Clause-chains behave like coordinated clauses, at least as far as switch-reference is concerned. Let's assume that clause-chaining is coordination, but one where the internal conjunct precedes the external one. This difference becomes important in narration. When your language has sentential coordination, you can simply connect clauses together by putting one at the left-edge of the second conjunct. If there is switch-reference, you can even connect to other speakers' clauses ((38), pg. 59). However, clause-chains have their connective at the right edge, thus the connectives cannot be used at the left-edge by themselves. Without a coordinating conjunction at the left-edge the only way to connect two distinct chains is to repeat the previous clause as a medial verb in a chain. This a very standard environment for using a pro-verb, as the Amele example in (252) shows. The recapitulative verb in (252b) refers to the entire clause in (252a).

(252) a. Sain leih dana age jo eundec ben ca cehe-gi-na.
time some man 3p house that kind big with build-3p-PRES
'Sometimes the men make one of those houses bigger.'

b. **Od-i-me-ig** cuamu ijed o wal oso eu odi qahe-gi-na.
do-Pred-SS-3p room three or four INDEF that like break-3p-PRES
'They divide it into three or four rooms.' ((Stirling 1993; Roberts 1987))

Recapitulative verbs raise an interesting question about ellipsis that could be very informative of the semantics and syntax of switch-reference. Essentially, how does the SR morpheme access the elided pivot? I am not sure what the answer might be, although theories of ellipsis should provide an excellent basis for investigation. The first step in addressing this question will be to figure out exactly

what structure the pro-verb is replacing, and that will require some fieldwork on these languages.

5.2.2 Complement clauses

Some languages have switch-reference in complement clauses. Choctaw is one that is relatively well-studied, although no detailed semantic work has been done on Choctaw complement clauses. Yet, they do not seem terribly out of the ordinary, so we can get a decent preliminary sense of how the theory presented here can be applied to its complement clauses, especially in attitude reports.

Broadwell (2006) observes that SR-marked complement clauses involve subject tracking, as the following examples demonstrate.[8]

(253) Pisachokma-**ka-t** ikhán̲a-h
handsome-COMP-SS know-TNS
'He$_1$ knows that he$_1$ is handsome.'

(254) Pisachokma-**ka̲** ikhán̲a-h
handsome-COMP/DS know-TNS
'He$_1$ knows that he$_2$ is handsome.' (Broadwell 2007: 264)

The subject-tracking is expected, since complement clauses of attitude predicates are intensional. However, the semantics of complement clauses raises an interesting question about the role of binding from C° in switch-reference.

Complement clauses in attitude reports are interpreted as properties, ascribed to some argument in the matrix clause, called the *res*. The distinction is shown in the English examples in (255), where an overt *res* is added. We can thus derive the

[8]Choctaw can form complement clauses in two ways. One is to use a complementizer, *ka*; this clause has SR marking, where *-t* marks SS, and suprasegmental nasalization marks DS. The other ways is to use a determiner, *ma*; this is case-marked, not SR-marked.

distinction between *de se* readings of attitude clauses, which are about the attitude holder, and *de re* readings, which are about something else.

(255) a. *de se*: x_1 thinks (about x_1) [that λx. x is handsome]

b. *de re*: x_1 thinks (about x_2) [that λx. x is handsome]

What is intriguing is the source of the CP property— it's binding from C°, which is co-indexed with the *res*. This is interpreted as a binding structure, where the index on C° is interpreted as a λ-operator binding a variable in the embedded clause.

(256) a. *de se*: x_1 thinks (about x_1) [$C°_1$ x_1 is handsome]

b. *de re*: x_1 thinks (about x_2) [$C°_2$ x_2 is handsome]

Recall that under the theory proposed here, C° binds the SR variable, creating a property of anti-pivots. It thus predicts that the anti-pivot, which is the attitude holder (i.e. the matrix subject), will always be the *res*. However, this is not the case. In 257, the matrix subject is not represented in the embedded clause.

(257) ...am-ikhá̲na-aki̲li-ttook [naahollo' ano̲pa'
1sIII-know-indeed-DistPt white people language
ano̲poli-li-ahii-kiiyo-ka̲]
speak-1sI-irr-neg-comp/ds
'... they knew that I didn't speak English' (Broadwell 2006)

Or is it? The semantics of switch-reference presented here claims that the anti-pivot is represented in the pivot clause, though indirectly, by the SR pronoun. However, the SR pronoun is bound by C°, which independently binds a variable in the clause as well. We might suspect, then, that SR-marked complement clauses, whether SS or DS marked, are always *de se*: They describe the property of being identical to or disjoint from the embedded subject.

This suspicion does not seem correct. For one thing, it is implausible— the *res* would always be bound by the anti-pivot. The verb agreement in (257) shows why. The attitude predicate is marked for 1st person singular agreement, even though the speaker is not the attitude holder. Third person agent marking is null, while the *am-* prefix signals 1st person singular marking of class III. Class III markers are used on verbs generally for indirect objects or possessors, and Broadwell argues that they are actually the Class II markers with an applicative suffix.[9] Abstracting away from the technical details, it seems clear that the *res* argument is triggering agreement of some kind. Thus, the *res* does not necessarily co-refer to the attitude holder, and the complement clauses are not necessarily *de re*.[10]

If SR-marked complement clauses are not all *de se*, we have two other possible options to explore. First is that the complementizer can bind multiple objects. That is, it has more than one index. For type reasons, these indices cannot both be parsed as merging at the same projection; one could feed the C° or be the interpretation of the head, while the other is interpreted above the head (259). This 'double binding' from C° would have the result that SR-marked attitude verbs have one argument more than their non-SR counterparts do. This might have unwelcome effects on the composition of complement clauses, or they might fit well; more investigation is required.

(258) x_1 [v° [thinks (of x_2) [$_{CP}$ $\underline{\lambda_1}$ C°$_{1,2}$ λ_2 [$_{SRP}$ x_2 [$\underline{\text{SR°}_1}$ [λx. x is handsome]]]]]]

---

[9]To rule out the possibility of agent marking with *know*, note that 1st person singular agents are marked by the class I marker *-li*, a suffix that is found in the embedded clause in this example.

[10]In a Choctaw *de se* environment, the attitude verb can be reflexivized.

(1) John-at [pisachokma-ka-t] il-anokfillih
John-NOM be:good looking-C-SS REFL-think
'John$_1$ thinks that he$_1$ is good looking' (Broadwell 1997: 15)

Broadwell analyzes (1) as reflexive raising, since the elicitation can also lead to a sentence with the embedded verb reflexived. Yet, we predict this reflexive if the *res* is represented in the agreement, and is bound (since the clause is interpreted *de se*).

A second option is for the SR pronoun to be bound by $v°$, rather than C°. Perhaps it is not possible for an attitude complementizer C° to bear more than one index, but the SR pronoun has to be bound. Rather than crashing, it is simply bound by the next available binding functional head: $v°$.

(259) x_1 [$v°_1$ [$\underline{\lambda_1}$ [thinks (of x_2) [$_{CP}$ $C°_2$ λ_2 [$_{SRP}$ x_2 [$\underline{SR°_1}$ [λx. x is handsome]]]]]]]

Binding from $v°$ would link the anti-pivot to the attitude holder with certainty, and avoid problems with the semantic type of the CP. It is also very intriguing, since it could well be extended to adverbial clauses. However, before settling on this approach, there are drawbacks: It might encounter difficulties with locality, it removes the parallel to other CP types, which involve binding from C°, and it undermines the application of Moulton's solution to CP dislocation (section 4.5.1), which relies on the variable being saturated within the abstracted-over constituent.

These different approaches to understanding switch-reference with complement clauses are each interesting, but at this point, none are developed past the stage of suggestion. Detailed semantic investigation is required. Perhaps the Choctaw language, where the descriptive groundwork has already been laid, is the language best suited to this investigation.

5.2.3 Relative clauses

In a small number of languages, switch-reference is found on relative clauses. The examples I am aware of are all in North America (Jacobsen 1983).[11] If the relative clause is externally-headed, the theory presented here faces the same issue it did with complement clauses. Relative clauses are created by $\overline{A}$-binding from C°,

[11] Austin (1981) in his typology of switch-reference in Australia uses the term 'relative clause' to describe adverbial clauses that are interpreted as temporally preceding or simultaneous to the dominant clause, in contrast to 'implicative clauses' which are future-interpreted.

whose index is interpreted as a λ-operator. Thus, the relative clause is a property that will be ascribed to the head noun. If switch-reference involves binding from C°, we would expect the head noun to always be the anti-pivot. However, this is not the case— the anti-pivot is the dominant clause subject. This is clear in the following examples from Washo:

(260) k'ák'aʔ dáː ∅–géːgel–i–**š**–ge ∅–yáːm–aʔ
heron there 3-sit-IMPF-DS-DET.ACC 3-speak to-AOR
'She spoke to a heron who was sitting there.'

(261) gitŋaʔmímiŋ ∅–bóːŋiy-i-∅–ge ∅–wehigíːgithay-aʔ
children 3-call-IMPF-SS-Det.Acc 3-tell what to do-AOR
'She called her children, whom she told what to do.'

(262) daʔmóʔmoʔ da ʔ–éʔ-∅-gi ∅–p'ímewaʔ-aš
woman there 3-be-IMPF-SS-DET.NOM 3-go out-AOR
'A woman who was there went outside' (Peachey 2006)

Subject-tracking is a problem for externally-headed relative clauses. However, Washo and the other switch-reference languages with SR marked relative clauses have internally-headed relative clauses (IHRC's). For instance, in Washo, the head remains in the clause, if it is overt at all, while the clause final morpheme *-ge/gi* indicates the case of the head noun. In this respect and a few others, Washo IHRC's resemble those found in Korean or Japanese. Min-Joo Kim (2004) effectively argued that IHRC's involve a proposition (of type $\langle s,t\rangle$) embedded under a quantificational relativizing head (Rel°), which is in turn embedded inside a DP, from which its projection QR's. I suspect that switch-reference would work normally with EHRC's if they QR to the edge of VP, rather than to some higher projection, but a lot of tweaking of Kim's EHRC architecture might be required, and without semantic fieldwork, it is not clear at this stage what tweaks would be independently motivated.

To summarize, to ensure that the theory of switch-reference proposed in Chapter 4 has cross-linguistic import, we must examine how it behaves with other types of embedded clauses. Unfortunately, any strong claims on these matters currently elude us, since the previous investigation of these languages has not provided us with the required data.

5.3 Closing remarks

This dissertation closes with what I hope to have accomplished by conducting this study. First and foremost, this dissertation offers a new theory of switch-reference, based on the first critical look at switch-reference with both the syntax and semantics in mind. This theory leads to an understanding of the syntax and semantics of SR morphemes themselves, it offers testable predictions for other languages that still have room for variation, and it can help understand the nature of clause-chains.

The theory provides interesting results for our understanding of linguistic theory. It ties switch-reference to other anaphoric embedding phenomena. It shows that coherence effects— the scene-tracking— can emerge from reference-tracking. It provides the first clear demonstration of morphology sensitive to situations, and in doing so it provides a useful diagnostic for following topic situations.

This dissertation also offers two key benefits in a broader domain than the nature of switch-reference. First, it demonstrates the value and necessity of theory-driven elicitation in the field. Without a clear understanding of the meaning of the expressions where switch-reference is found, we must hesitate to make strong generalizations about its usage and distribution. Secondly, it is my profound hope that the contents of this dissertation will, with the proper distillation, be able to inform teachers and learners of languages with switch-reference. Many of these languages, especially those in the Americas, are in grave danger of extinction. Only

a concerted effort can preserve, maintain, or revitalize them. These efforts require the most complete conscious understanding of the language possible, in order to produce completely fluent speakers. Two genres that are only mastered by completely fluent speakers are extended dialogues and narratives. Switch-reference plays an important role in both. Thus, any progress in our comprehension of switch-reference should help us with our efforts to ensure these languages' survival. *Óbàhàu*.

APPENDIX A

GLOSSING ABBREVIATIONS

Agreement Prefixes

[α]	intransitive
[α : β]	transitive (subject : direct object)
[∅ : α : β]	intransitive dative (null : nominative : dative subject)
[α : β : γ]	ditransitive (agent : direct object : indirect object)

[1s]	1st person singular
[1di]	1st person dual inclusive
[1dx]	1st person dual exclusive
[1pi]	1st person plural inclusive
[1px]	1st person plural exclusive
[2s]	2nd person singular
[2d]	2nd person dual
[2p]	2nd person plural
[3s]	3rd person singular
[3d]	3rd person dual
[3i]	3rd person inverse number
[3pa]	3rd person plural animate
[3pn]	3rd person plural inanimate
[rfl]	reflexive

Morpheme categories

ABS	Absolutive case
ACC	Accusative case
ADV	Adverbial clause connective
AOR	Aorist tense
AUX	auxiliary verb
BAS	basic number
DECL	declarative mood
DEF	definite
DETR	detransitive
DISTPT	distant past tense
DS	different subject/situation marking
ERG	ergative case
EVID	indirect evidentiality
HAB	habitual/generic aspect
HORT	hortative
ICPT	inceptive aspect
IMPER	imperative mood
IMPF	imperfective aspect
INCH	inchoative
INDEF	indefinite
INTJ	interjection
INV	inverse number
IRR	irrealis mood
MERGE	*the meaning of this gloss was not provided
MOD	modal
MV	middle voice
NEG	negation verb-marking
NML	nominalizing morpheme
NOM	nominative case
NONFUT	non-future relative tense
NPST	non-past tense
OBL	oblique argument
PF	perfective aspect
PRES	present tense
PROG	progressive aspect
PT	past tense
RCP	reciprocal
REMPT	remote past
SG	singular verb stem
SS	same subject/situation marking
TNS	unspecified tense
WH	wh-form
X	unknown gloss
Y	y-grade aspect

APPENDIX B

INDEX OF LANGUAGES EXEMPLIFIED

APPENDIX C

INDEX OF LANGUAGES MENTIONED

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