Inferred Propositions and the Expression of the Evidence Relation in Natural Language
Evidentiality in Central Alaskan Yup'ik Eskimo and English

A Dissertation
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Doctor of Philosophy
in Theoretical Linguistics

By

Elizabeth A. Krawczyk, M.S.

Washington, DC
February 2, 2012

Copyright © 2012 by Elizabeth A. Krawczyk
All Rights Reserved

Inferred Propositions and the Expression of the Evidence Relation in Natural Language
Evidentiality in Central Alaskan Yup'ik Eskimo and English

Elizabeth A. Krawczyk, M.S.

Dissertation Advisor: Dr. Paul Portner

Abstract

Evidentiality has usually been defined as the grammaticalized expression of a speaker's evidence source for a proposition, where *evidence* is conceptualized as a speaker's source-type for a particular proposition (Aikhenvald 2004). How this evidence source-type and the evidential are related has yet to be formally modeled in the formal semantics literature. In fact, defining *evidence* has been considered a problem not relevant to linguistics (Faller 2002). In most cases, what is meant by the term *evidence* is never even discussed.

If it were the case that evidentials exhibited regular behavior, only marking those propositions learned by whichever the particular type of evidence that it is considered to express, then the semantics of evidentials would not require further discussion. Things are not this simple, however, as there are a number of cases of evidence-evidential mismatch, where an evidential is used felicitously in spite of the fact that the speaker does not possess the correct evidence source-type (Faller 2002; Krawczyk 2009, 2010). The source-type description of evidentials does not reflect the facts, and only describes the basic, typical cases. Oversimplification of the evidential signal as source-type obscures interesting facts about evidentials and evidence.

The goal of this dissertation is two-fold. The first is to provide a more thorough discussion of what it means to be evidence for evidentials; the second is to illustrate how a model of evidence can capture the semantics and pragmatics of evidentials. I formalize the notion of evidence relevant to evidentials as an EVIDENCE RELATION, an abductive inference to the best-fit explanation given what one observes, and propose that evidentials mark those

propositions that are the best-fit explanation for the speaker's observation. I use original data from Central Alaskan Yup'ik Eskimo and English, as well as data from other publications, to illustrate how the evidence relation and best-fit explanation proposal can account for both the normal and problematic cases for the source-type approach, and provide insight into the nature of evidentiality in general.

INDEX WORDS: Evidentiality, Evidence, Abduction in Language, Typology, Central Alaskan Yup'ik Eskimo, English

Acknowledgements

This dissertation could not have been possible without the guidance of my advisor, Dr. Paul Portner. Paul always pushed me to be better, and even though there were times that I could not see the method to the madness, there is no doubt that in the end, I produced work better than even what I thought was my best. His stubborn belief in me persisted through those times when I didn't have any in myself. For that there is no replacement, and I am forever grateful.

I also owe a great deal of thanks to my committee member Dr. Graham Katz. Graham's ability to see the gaps of any system never fails to impress me, and I was extremely lucky to have his attention and support not only with the dissertation, but also throughout my graduate training. He was both my mentor and comrade, and this project would not have been as successful without his kindness, wit and keen intellect.

I also must thank my other committee member, Dr. Steven Kuhn. While Steve's perspective from philosophy was useful, his ability to be positive and always encouraging was something that I appreciate much more. I am very glad that he was able to contribute his time to serve on my committee. Without him, there would have been more tears than the normal amount usually associated with dissertation writing.

The Yup'ik Eskimo community and the Jacobs Research Fund, which financed my fieldwork trip to Bethel, Alaska in 2009, made this entire project possible. I am very grateful to Steve Street at the Association of Village Council Presidents (AVCP) in Bethel for allowing me access to the archived interview transcriptions. I am completely indebted to my Yup'ik Eskimo native language consultants, Davina Carl, Monica Shelden, and Julia Jimmie (Bethel AK) and Deanna Latham (Fairbanks AK), without whom, there would be no data to discuss, and the contribution here much more narrow. I am also grateful to Sophie and Oscar

Alexie for offering a distance-learning Yup'ik course (via telephone!) through the University of Alaska Fairbanks Kuskokwim Campus, their help in providing a place to start once I got to Bethel, and a way to meet Jennifer Peeks ("Ayalgalria") at the UAF Kuskokwim Campus who also helped me enormously, before getting to, and once in, Bethel. Minnie Sallisan Fritz gave me a great, fun place to stay and introduced me to Steve and Monica at the AVCP. Their kindness made me forget how cold and isolating western Alaska can be in winter.

I also have a great personal support network to thank. I would have never finished if it were not for the dogged support of my parents, Hilary and Stephen, who, thankfully, were ignorant to what the process of writing and finishing a dissertation entailed. Their continued support and encouragement at all times made it possible for me to finish what I started. I am forever grateful that Dr. Ruth Kramer came to Georgetown in my dissertating years so I could have someone to let me know that will-power is a muscle that wears out. I also owe a great deal of thanks to Hillary Harner, who proofread most of this behemoth and muddled her way through my rather idiosyncratic writing style. Whatever mistakes that remain here are entirely my own.

List of Abbreviations: Yup'ik Eskimo Morphology

The following is a list of abbreviations for the Central Alaskan Yup'ik Eskimo morphological categories that are used throughout the dissertation. This list does not include abbreviations from examples taken from outside sources; for questions regarding other researchers' notation, I refer the reader to the original source that is cited with the example. For more information on Yup'ik that is not included here, I refer the reader to Jacobson's (1995) Yup'ik Eskimo grammar.

IND	Indicative Mood
SUB	Subordinative
INT	Interrogative Mood
OPT	Optative Mood
SUB	Subordinative Mood
PART	Participial Mood
CONN	Connective Mood
ABS	Absolutive Case
REL	Relative Case
ABL	Ablative-Modalis Case
TERM	Terminalis Case
LOC	Locative Case

SG	Singular Person
PL	Plural Person
DUAL	Dual Person
1	First Person
2	Second Person
3	Third Person
4	Fourth Person (Obviative)
$\{\text{number,person}\}_s$	Subject (transitive)
$\{\text{number,person}\}_o$	Object (transitive)
INF	Inferential Evidential
HRD	Reportative/Hearsay Evidential
FUT	Future Tense
PAST	Past Tense
Y/N-Q	Yes/No Question
=	Indicates Morphological Enclitic
-	Indicates Morphological Postbase

Table of Contents

Acknowledgements v

List of Abbreviations: Yup'ik Eskimo Morphology vii

List of Figures x

List of Tables xi

Chapter

1 Introduction & Data:
Evidentiality in Central Alaskan Yup'ik and English 1
1.1 Central Alaskan Yup'ik: Grammar and Evidentiality 6
1.2 English Evidentiality 38

2 Indirect Evidentiality: Data and Formal Semantic Approaches 63
2.1 Inferential Evidentiality 64
2.2 Reportative Evidentiality 84
2.3 Formal Semantic Analyses of Evidentials 104

3 Formalizing a Notion of Evidence 146
3.1 Typology of Evidentials and Evidence Source Types 146
3.2 Limitations of Evidence Source Type Definitions 161
3.3 The Evidence Signal of Evidentials and Epistemology 175
3.4 The Evidence Signal of Evidentials and Conditional Probabilities 181
3.5 The Evidential Value of Hearsay 188
3.6 Evidence Contexts and Reasoning 193
3.7 Best-fit Explanations and Evidential Evidence Relations 212

4 Evidence Expressed: Evidentials 230
4.1 Revising Initial Evidence Relations: Assumed and Apparent Evidentials 234
4.2 Evidence-Evidential Mismatch Cases and the Inferential (Apparent) Evidential 245
4.3 $R_I \leftrightarrows R_H$ Interpretations of *Apparently/Evidently* (and Evidential Perfects) 261
4.4 Evidence Relations and *Clearly, Obviously* 263
4.5 The Hearsay Evidence Relation R_H and Reportative Evidentials 277
4.6 Pedro's Hen: $R_H > R_I$ 291

5 Conclusions, Remaining Issues and Future Directions 295

Bibliography 300

List of Figures

2.1 Willet's (1988) Evidential Taxonomy 63
2.2 Taxonomy of Reportative Evidentiality 90
2.3 Formal Semantic Approaches to Evidentials 104
2.4 Murray's (2010) Initial Common Ground c_0 114
2.5 Murray's (2010) Update to c_0 with *EVp* 114
2.6 Murray's (2010) Proposal to Update to c_1 115
2.7 Murray's (2010) Initial Common Ground with CONJECTURAL 117
2.8 Murray's (2010) Proposal and Evidential Restriction of the CONJECTURAL . . 117
2.9 Murray's (2010) Proposal, Evidential and Modal Restriction of the CONJECTURAL 118
2.10 Murray's (2010) Model of the REPORTATIVE Evidential Speech Act 119
2.11 Davis et al.'s (2007) Manipulation of c_τ with S[**ev**] 143
3.1 Faller's (2002) Evidential Maxim 170
3.2 Evidence Relations and Evidentials (Preliminary) 228
4.1 Evidence Relation Types and Evidentials (Revised) 240
4.2 Hearsay Evidence in Two Dimensions 285

List of Tables

1.1 Summary of Yup'ik Evidentials and Restrictions 38
1.2 Summary of Basic Findings: Yup'ik and English Evidentials 61
3.1 Aikhenvald's (2004) Typology of Evidentials 151
3.2 Yup'ik and English Evidentials and Types 159
3.3 Yup'ik and English Evidentials and System Classification 160
3.4 Bayesian Terms & Definitions 182
3.5 Federal Rule of Evidence 803: *Declarant Available* 190
3.6 Federal Rule of Evidence 804: *Declarant Unavailable* 191
3.7 Evidence Context Types, Summary Descriptions & Felicitous Evidentials . . . 194
3.8 Infelicitous Contexts of the Apparent Evidential 207
4.1 The Apparent-Assumed Distinction 241
4.2 Phil's Evidential Surprise, Observations and Evidence in Time 254
4.3 Summary of Inferential Evidential and Literal/Non-literal Uses 259
4.4 Generic Types of "Asserters" 284
4.5 H_O and Evidential Choice 291
5.1 Evidentials in Terms of Certain/Uncertain 296
5.2 Evidentials of Uncertainty: Informative Probability, Observation Specificity . 298

Chapter 1

Introduction & Data:
Evidentiality in Central Alaskan Yup'ik and English

The data from our senses inform our knowledge about the world, and can sometimes be expressed grammatically. Evidentiality is the linguistic expression of a speaker's evidence source for a proposition. An example of a grammaticalized evidential system can be found in Tariana, a Maipurean (or Arawakan) language spoken along the Vaupués River in Amazonian Brazil, where five different evidential morphemes each express a different source type for the speaker's knowledge of a proposition that it marks (Aikhenvald 2004). In the example in (1) below, a speaker chooses the morpheme which best describes the evidence source he has for the proposition, *José played football*. For example, if the speaker witnessed José playing football he would mark the proposition *José played football* with the visual evidential *-ka*, but if the speaker only inferred that José played football, perhaps because José's new cleats are now caked in mud, the speaker would express the same proposition, *José played football* marked with the inferred evidential morpheme *-nihka*. The speaker alters his utterance by a single morpheme, in order to reflect this change in how he learned the proposition.

(1) Tariana Evidentials

*Juse ɨrida di-manika-**ka/mahka/nihka/sika/pidaka***

José football 3sgnf-play-rec.p.vis/rec.p.nonvis/rec.p.infer/rec.p.passum/rec.p.rep

'José has played football-[We saw/heard/inferred/assumed/were told.]'

(Aikhenvald 2004: 2-3)

All evidential expressions in all evidential systems, from the simple binary to the complex quinary, are defined as expressions of a speaker's evidence source for a proposition; and this

is the standard definition of evidentiality assumed by the descriptive and formal literature in linguistics alike (Izvorski 1997; Faller 2002; Matthewson, Davis and & Rullman 2007; McCready & Ogata 2007; Davis, Potts & Speas 2007; Murray 2010, and many others). The term *evidence source*, however, is deceptive in its apparent simplicity, as *evidence* and *source* describe two different notions. *Source* is the perceptual, sensory modality in which the proposition is learned (e.g., sight, hearing). *Evidence* on the other hand, is the data that provide a reason to believe something to be true.

What licenses such kinds of inferences from the data we perceive is a problem centuries old, and yet the complex nature of evidence is relatively ignored in the linguistic literature on evidentiality, which conflates evidence and source into one basic, singular notion (Krawczyk 2009, 2010; McCready 2010). There are consequences for those formal theories which adopt this simplified approach to evidence that become particularly apparent in the cases where the evidential and the evidence source it is assumed to express do not align. Speakers can productively use evidentials in cases where they do not have what is argued to be the corresponding evidence type (Krawczyk 2009, 2010; Aikhenvald 2004). Theories which hard-code evidentials with the expression of a particular source type are not able to accommodate the range of the evidentials' semantics. The goal of this dissertation is to further investigate what it means to be *evidence*, and the reasoning process involved in cases where evidentials are expressed felicitously. By acquiring a more informed understanding of the nature of evidence, we can better model the natural language expression of evidence, the *evidential*.

1.0.1 Structure of the Dissertation

The dissertation is divided in the following way. The remainder of this chapter introduces the reader to the basic grammatical structure and the evidentials of Central Alaskan Yup'ik Eskimo, the inferential *-llini-* and the reportative *=gguq*.[1] I then provide a parallel discussion

[1]In the linguistic literature on Eskimo-Aleut languages, the symbols "-" and "=" mark different morphological affixes. The symbol "-" indicates that the morpheme is a post-base, and "=" indicates that the morpheme is an enclitic. I refer the reader to the discussion in section 1.1.1 from more detailed discussion on Yup'ik Eskimo morphology and syntax.

for English adverbs *apparently, evidently, clearly, obviously, reportedly, allegedly, according (to X)* and *presumably*, in order to illustrate that English does have an evidential system. Note that the argument that these adverbs (and the adjectives *clear, obvious, reported, alleged, apparent* and *evident*) have an evidential interpretation is not a novel one, and has been discussed previously (Izvorksi 1997; Ifantidou 2001; Taranto 2006), but the contribution made here is a thorough investigation and comparison between the semantics of the evidential signal in these expressions in English, to a language where the claim that certain expressions are evidential is uncontroversial. Much of the discussion with respect to evidentials in this chapter is not further expanded upon later in the dissertation, but is presented to the reader as interesting data to be investigated at a later date.

In **Chapter 2** I provide a more in-depth overview of inferential and reportative evidentials and their evidence source expressions and the general paradigm of indirect evidentiality, and the place of English and Yup'ik evidentials within that paradigm. This dissertation is concerned with indirect evidentiality, those evidentials that are used in cases where the speaker has evidence that is not considered direct, as the original data here come from the evidential systems that encode only indirect evidentiality. I provide discussion of previous formal semantic approaches to evidentials, with a particular focus on how these analyses model the evidence signal of the inferential and reportative evidentials. I discuss specific cases that are problematic to these formal theories which take the evidence-source-type approach to the evidential expression, and the consequences of the assumption of the simplified notion of evidence as source type in the formal models.

In **Chapter 3** I discuss the evidence-source-type approach from the descriptive and typological literature, the one-to-one correspondence between a source type and an evidential expression, which the formal analyses inherit. In order to better understand the connection between evidence and evidential, I provide discussion from the perspective of epistemological theory, Bayesian probability and reasoning types and how these approaches to evidence provide insight into the specific nature of the evidence signal of evidentials. Using this new

data, I formulate a more specific notion of evidence that can be then be used for an analysis of the linguistic expression of evidentials, the evidence relation.

In **Chapter 4** I illustrate how the evidence relation is expressed by evidentials. I provide explanations of how the evidence relation sheds light onto the taxonomy of evidential expressions, and can explain those cases that proved to be problematic for evidence source type approaches. The evidence source type also uncovers connections between evidential types that may have been perceived as accidental.

In **Chapter 5** I summarize the main contribution of the dissertation to the study of the semantics of evidentiality, and discuss how the proposal here, that evidentials are expressions of an evidence relation, may better inform future formal models of evidentials.

1.0.2 A Summary of the Main Contribution

The main contribution of the dissertation is to provide a more in detailed discussion on what it means to be evidence in terms of the linguistic expression of evidentials. By determining the typology of evidence in terms of evidentials, the model provided here intends to illustrate how these expressions form a natural semantic class. While this fact about evidentials is assumed in the linguistic literature, it has not been explicitly shown. The model the evidential expression proposed here should be able to predict the use of a particular evidential in any novel context, which has been lacking from previously-proposed models. The model proposed here also provides insight into the taxonomy of evidentials and evidence types, links between certain types of evidence expressed by evidentials that were perhaps considered accidental, and how evidentials are separate them from other natural language expressions that are also considered to have an evidential component in their semantics (e.g., epistemic modals, English adverbs *clearly/obviously*). The proposal offered here is intended to provide a better-informed platform on which to build formal semantic models of evidentials and expressions of uncertainty in future formal semantics and pragmatic analyses, as well as

other discourse applications which concern the semantics of expressions of uncertainty and inference.

1.0.3 The Data: Central Alaskan Yup'ik and English

Much of the data in this dissertation comes from Central Alaskan Yup'ik Eskimo, an Eskimo-Aleut language spoken in western Alaska in the Yukon-Kuskokwim delta. Central Alaskan Yup'ik also includes many dialects, some larger than others which are considered their own language, such as Cup'ik (a dialect spoken in Chevak), and Cup'ig (a dialect spoken in Nunivak). The Yup'ik language is spoken by 10,000 speakers, of a total ethnic population of 21,000.[2] Yup'ik is still many people's primary language, although lexical borrowing from English is becoming more common.[3] There are also many institutions which offer formal instruction in Yup'ik, such as bilingual Yup'ik-English grammar schools and university-level degree programs in Yup'ik at the University of Alaska Fairbanks and junior regional colleges in the University of Alaska system.[4]

The Yup'ik data presented here comes from a variety of sources, which include stories, grammars, and dictionaries. These examples are supplemented with original fieldwork data, which was collected in Bethel, Alaska in the Fall/Winter of 2009, funded by a grant from the Jacobs Research Fund, Whatcom Museum (Bellingham, Washington).[5] For the discussion of evidentiality in English, the grammaticality judgments provided are my own, which may not always align with other native speakers' judgments.

[2]Alaska Native Language Center: http://www.uaf.edu/anlc/languages/cy/

[3]Borrowing from contact languages in Yup'ik is not a novel trend; many lexical items in Yup'ik are Russian borrowings (Jacobson 1984, 1995). For example, the word for 'store' in the Yukon dialect is *lavkat*, a borrowing from Russian *lavka*.

[4]For more on education in Yup'ik, see Jacobson (1984) *Central Yup'ik and the Schools* (http://www.alaskool.org/language/central_yupik/yupik.html).

[5]IRB #2009-523

1.1 Central Alaskan Yup'ik: Grammar and Evidentiality

In the example of Tariana evidentials provided in (1), the evidential morphemes occupy the same position in the syntax no matter what the particular type of evidence is expressed, but this is not the case for all evidential systems.[6] Evidentiality in the languages of the Eskimo-Aleut family exhibits SCATTERED CODING (Fortescue, 2003), where evidentiality is encoded in two different types of affixes: inferential evidentials are POSTBASES, or derivational suffixes, and reportative evidentials are ENCLITICS, or clause-level affixes.

Eskimo-Aleut and the Scattered Coding of Evidentiality

In West Greenlandic (also known as Kalaallisut), a more well-studied Eskimo-Aleut language spoken in Greenland and Denmark, evidentiality is expressed through both *portmanteau* morphemes,[7] and a clause-level morpheme. Fortescue (2003) argues that there are four evidential expressions: the indirect evidential *gunnar* (1a), the perfect *sima* (1b), the perfect *sima* +*ssa* (1c), and the hearsay particle *guuq* (1d).

(1) Scattered Coding of Evidentiality: *West Greenlandic*

(a) Indirect evidential *gunar*

(*tangaarami*) *unnua-a-**gunnar**-puq*

(it is so dark) night-be-INF-3SG+INDIC

'It must be night (to judge from the light).'

(b) Perfect *sima*

(*takuuk masak*) *siallir-**sima**-vuq*

(look it is wet) rain-PRF-3SG+INDIC

'It appears to have rained (said when going outside and seeing a pool of water after it has stopped raining).'

[6] Cinque 1999 analyzes the position of evidentials in the syntax as an adverb (adjunct/non-argument) position.

[7] Typically morphemes whose primary role is tense and/or aspect.

(c) PERFECT *sima* + *ssa*[8]

(*naaj puuqattara*?) *tammar-**simassa**-aq*

(where is my bag?) get.lost-PRF+SSA-3SG+INDIC

'It must have gotten lost (logical conclusion from the object's absence from its expected place).'

(d) REPORTATIVE *guuq*

*Tuumasi-n-n**guuq*** *qilalugaq* *pisar-aa*

Tuumasi-REL-HRD beluga catch–3SG/3SG+INDIC

'Tuumasi caught a beluga (they say).'

(Fortescue 2003: 294-296)

West Greenlandic inferential evidentials *gunar*, *sima*, and *simassa* are postbases, or semantically-rich affixes which attach to the verbal stem. The reportative *guuq* is an enclitic, an affix that attaches to the first (or highest) lexical item of a sentence. In fact, all Eskimo-Aleut evidentiality is morphologically similar, as inferential evidentiality is encoded in postbases, and reportative evidentiality is encoded as enclitics. Yup'ik is not an exception to this rule.

Yup'ik has only two evidentials, the indirect/inferential *-llini-*, and the reportative/hearsay evidential *=gguq*. Unlike West Greenlandic, Yup'ik does not seem to have a perfect in addition to the inferential evidential.[9]

[8]Fortescue claims that *simassa* is "more certain" than *sima* alone.

[9]Fortescue (2003) argues that *-llini-* is a perfect related to West Greenlandic *sima*, and not the [West Greenlandic] inferential evidential *gunnar*. It seems that most literature on Yup'ik argue that *-llini-* is an inferential evidential (Jacobson 1995, Mithun 1996), and this dissertation argues it to be such. Perhaps in the case of Yup'ik, inferential evidentiality and the perfect have been collapsed into one morpheme. Yet *-llini-* does not seem to be an evidential perfect, as its behavior is divergent from the so-called evidential perfects of Bulgarian (Izvorski 1997). For example, evidential perfects can mark propositions that can be subsequently denied by the speaker, and take on a reportative interpretation. A proposition marked with Yup'ik *llini* cannot be felicitously denied.

(2) Scattered Coding of Evidentiality: *Central Alaskan Yup'ik*

(a) Inferential

*Aya-llru-**llini**-uq*

leave-past-inf-ind.3s

'Evidently she left'

p = She left

ev = indirect/inferential evidence

(b) Reportative

*Aya-llru-uq=**gguq***

leave-past-ind.3s=hrd

'She left, they say/it is said'

p = She left

ev = hearsay evidence

Due to the fact that evidentiality in Eskimo-Aleut is distributed across morphological categories, I provide some background on Eskimo-Aleut morphology, of Yup'ik in particular.

1.1.1 Eskimo-Aleut Morphosyntax

Languages in the Eskimo-Aleut family are polysynthetic, ergative-absolutive languages, which makes use of three types of affixation: postbases, endings, and enclitics.[10] Enclitics are "a small specialized group of suffixes which are written separated from the main part

[10]In Yup'ik, just as with other ergative-absolutive cases, subjects of intransitive verb constructions are marked with the absolutive case. In Yup'ik, subjects of transitive verbs are marked with what Jacobson (1995) refers to as the relative case (rather than ergative), and *objects* of transitive verb constructions are marked with the absolutive.

(i) *Arna-m* *qimugta* *nunur-aq*
woman-rel.3sg dog-abs.3sg scold-ind.3sg
'The woman is scolding the dog.'

of the word," and outside the rhythmic stress patterns of the word (Jacobson 1995: 12).[11] Postbases are suffixes which attach to a verbal or nominal base, and are derivational affixes. de Reuse (1994) argues that many of the postbases in Eskimo actually contain rich lexical meaning, derived from full words (de Reuse 1994; Aronnoff 1992). This type of affixation is not considered incorporation, as languages of the Eskimo-Aleut family are argued to not have true incorporation (Baker 1988). Endings are inflectional morphology that mark mood, and inflect for person, number and transitivity. The basic structural template of a Yup'ik word/sentence is displayed in (3) below.[12] The first row consists of the Eskimo-Aleut linguistics-specifc terminology, and second row lists the more generalized terminological equivalents.

(3) Structure of the Yup'ik Word

BASE	-	POSTBASE(S)	-	ENDING	=	ENCLITIC
root		*derivational affix*		*inflectional affix*		*clause-level marker*

In glossing, affixation of postbases and endings are indicated by a hyphen "-" and enclitics are marked distinctly, with "=". In normal Yup'ik orthography, enclitics are separated with a hyphen. An example of Yup'ik orthography, morphological parsing, grammatical glossing, and translation conventions, are provided in (4).

[11]For example *nuna-qaa* 'the land?' is not *[ˈnu.ˌnaː.qaa], but rather [ˈnu.naq.ʔaa](Jacobson 1995: 12-13). The former option, which has rhythmic lengthening on the second syllable, would be the stress pattern for a trisyllabic word with a penultimate heavy syllable. Such is not the case, as the penultimate syllable is not lengthened. Note also that utterances with the Y/N-question morpheme *=qaa*, an enclitic, have a falling intonational contour.

[12]Note that in Yup'ik, tense is expressed on the postbase level, and not inflected in the endings. A major debate in linguistic studies of Eskimo-Aleut (Kalaallisut/West Greenlandic, in particular), is whether these languages are "tenseless", and only mark mood (Bittner 2008; Shaer 2003), or whether they have tense (Kleinschmidt 1851; Bergsland 1955; Fortescue 1984). The Jacobson (1995) grammar considers some post-bases as marking tense and I conform to the Jacobson grammar in regard to this matter.

(4) Affix Types in Orthography and Glossing: *Central Alaskan Yup'ik*

Orthographic	*itellrunnga*	*nerlua-llu*
Morphological	ite-llr-uunga	ner-**lu**-a=llu
Gloss	go inside-past-ind.1sg	eat-sub.1sg=and
Translation	'I went inside and ate.'	

Examples provided here are given in three layers: a morphological parse, a grammatical gloss, and translation. In the prose, I drop the "-" and "=" notation with respect to the Yup'ik evidentials *-llini-* and *=gguq*, but continue to use the notation in the examples. As mentioned previously, the Yup'ik examples which follow come from a variety of sources; examples that have been taken from sources other than original fieldwork are cited accordingly, and do not alter the original author's conventions for glossing, transcription and translation.

1.1.2 Mood in Central Alaskan Yup'ik

Due to the fact that evidentiality in Yup'ik is morphologically scattered, there is some interaction between mood and modality in Yup'ik that is syntactic, and some that is semantic. The information provided here is meant to familiarize the reader with all relevant aspects of the Yup'ik Eskimo syntax and morphology in relation to Yup'ik evidentials. As this is not a dissertation on evidentiality in Yup'ik Eskimo in particular, but the linguistic phenomenon of evidentiality in general, I do not provide an analysis for much of the interesting data provided here, but must leave further investigation to future research.

The Jacobson (1995) grammar lists many "moods" of Yup'ik, but not all of the moods listed in Jacobson are considered standard moods. Jacobson divides Yup'ik mood into two categories, independent and dependent, where independent moods are the sentential moods (the indicative, interrogative and optative), and dependent moods of Yup'ik are what Jacobson calls the subordinative and connective moods (Precessive, Consequential, Consessive, Contingent, Conditional, Contemporative Moods). The connective moods seem to be adverbial constructions such as 'before' and 'after', and

not that which is traditionally thought of as mood. I refer the reader to discussion in Jacobson (1995) for the description of the connective moods. The subordinate mood is usually used to indicate a temporal sequence of events, an event that is "subordinate" to another event, or indicate a progressive that is used adverbially (Jacobson 1995). I do not discuss the dependent moods of Yup'ik here, and refer the reader to Jacobson (1995) for further discussion.[13] Yup'ik also has a PARTICIPIAL MOOD, which Jacobson does not categorize as independent or dependent mood, and is often found in narrative. Similar to the dependent moods, the participial mood may not be a typical mood, but it occurs quite often with the inferential evidential *llini* and is thus pertinent to the discussion here.

INDEPENDENT MOODS

The three independent moods of Yup'ik are the traditional sentence moods: the indicative, optative (imperative), and interrogative. Mood in Yup'ik is inflected for number, person and transitivity, where transitive constructions are marked for person and number of both the subject and object. In the case where the construction is intransitive, or in transitive constructions where the object of the verb is lexical, then the intransitive ending is used, and inflects for the person and number of the subject only. Transitive constructions are only used in the case where the object is not lexical, and pronominal or implicit. In the example below, the indicative transitive form for 3^{rd} person singular subject ($3SG_s$) and 3^{rd} person singular object ($3SG_o$) is given below in (5a). In the case where the object is explicit (a full lexical item), intransitive indicative morphology is used, as in (5b).

[13]One should note that there are of course exceptions to the dependent/independent mood distinction, and these exceptions generally occur in narratives. One exception is the subordinative mood in narratives. The subordinative mood is a dependent mood, but in narratives it can be used as an independent mood. In narratives, the subordinate mood may be used in place of an indicative verb in order to indicate a continuation of the story. This use of the subordinate mood as an independent mood occurs with longer stories. Jacobson claims that this use of the subordinative in narratives can be considered ÒautonomousÓ, but if the subordinate were to occur independently outside of a narrative context, it would not be considered grammatical (Jacobson 1995: 357; examples and discussion: 358-359). There are also exceptions to this exception: the subordinative mood cannot be used in place of the indicative mood in two cases, (i) in the opening sentence of a narrative, or a change of theme, or (ii) with the so-called "observational construction", which is marked with the participial mood (see section 1.1.2).

(5) Transitivity Marking in Yup'ik (indicative)

(a) Pronominal Object (Implicit)	(b) Lexical Object (Explicit)
Ner'-aa	*Arnaq ner'-uq neq-mek*
eat-IND.3SG$_s$-3SG$_o$	woman eat-IND.3S fish-ABL.3SG
'She is eating it.'	'The woman is eating [some] fish.'

(Jacobson 1995: 113)

Indicative Mood

The indicative mood is the independent mood which marks a declarative in Yup'ik. The indicative mood is inflected for 1^{st}, 2^{nd}, 3^{rd} and 4^{th} person,[14] and for singular, plural and dual number. The example below illustrates an intransitive construction; transitive constructions are inflected for the person and number of the object as well as the subject.

(6) Indicative Mood: Intransitive

(a) *cali-uq*	(b) *cali-unga*	(c) *cali-kuk*
work-IND.3SG	work-IND.1SG	work-IND.dual
'He is working.'	'I am working.'	'The two of them are working.'

Yes/no questions are marked with the indicative mood with the addition of the interrogative enclitic *=qaa*.

(7) *Pani-in-**qaa*** *elitnaurvig-mi*?
daughter-POSS.2SG=Y/N-Q school-LOC
'Is your daughter in school?'

(Jacobson 1995: 149)

[14] 4^{th} person is also known as *obviative* person. In some languages, with sentence constructions that have two 3^{rd} person arguments, one is considered the *proximate* or *topical* referent, and the other is considered the *obviative* or less topical or proximate referent (Mithun 2001[1991]).

Interrogative Mood

The interrogative mood is used to mark WH-questions (content questions). Below is a list of the WH-items in Yup'ik, which are also used to mark indefinite pronouns. WH-items can be inflected for number and case. Some forms are given in (8).

(8) YUP'IK WH-ITEMS/INDEFINITE PRONOUNS

camek/canek	'what-ABL$_{sg}$/ABL$_{pl}$'	'something'
nani/natmun/naken	'where-LOC/TERM/ABL'	'somewhere'
qangvaq/qaku	'when$_{\text{PAST/FUT}}$'	'sometime'
kina/kituu-	'who/be who$_{pl}$/be'	'someone'
ciin	'why'	'some reason'
qaillun	'how'	'somehow'

The interrogative is marked with the morpheme *-s/cit* (for non-"transitive" constructions).[15] The interrogative mood marker *-s/cit* affixes to the verbal stem (9a). In the example below in (9b), the interrogative mood morpheme *-sit* directly affixes to the WH-form *kituu-* 'who', as the construction lacks an explicit verb.

(9) WH-QUESTIONS

(a) *Qaku* *ayag-ciq-sit*?
when$_{\text{PAST/FUT}}$ leave-FUT-INT.2SG
'When are you leaving?'

(Jacobson 1995: 175)

(b) *Kituu-sit*
who-INT.2SG
'Who are you?'

[15] *-sit* for non *-te* stems, *-cit* for *-te* stems

The forms in (8) are not only used for WH-items and indefinite pronouns, but also for negative polarity (10).

(10) NEGATIVE POLARITY ITEM

Tange-qsait-ua	*ca-mek*
see-NEG-IND.1SG$_s$-3SG$_o$	who-REL.3SG

'I don't see anything.'

The interpretation of the WH-form is interpreted as a question if the utterance is marked in the interrogative mood, and an indefinite (positive or negative) pronoun in any other mood, even when marked with the Y/N-question marker, *=qaa*, as illustrated in the example below.

(11) (a) INDEFINITE PRONOUN

Kina	*taig-uq*
who-ABS.3SG=Y/NQ	come-IND.3SG

'Someone is coming.'

(b) NEGATIVE INDEFINITE PRONOUN

Kina	*tai-ksait-uq*	*nerevkarit-mun*
who-ABS.3SG	come-NEG-IND.3SG	party-ABL-MOD.3SG

'Nobody came to the party.'

(c) INDEFINITE PRONOUN IN Y/N-QUESTION

Kina-qaa	*taig-uq?*
who-ABS.3SG=Y/NQ	come-IND.3SG

'Is someone coming?'

(d) WH-QUESTION, INTERROGATIVE MOOD

Kina	*taiga?*
who-ABS	come-INT.3SG

'Who came?'

(Jacobson 1995: 185)

Optative (Imperative) Mood

The optative mood in Yup'ik is used for commands.[16] In (12), an example of 2^{nd} person singular intransitive and transitive forms are provided. The optative form varies according to the person and number of the subject, as well as the person and number of the object if transitive.

(12) Optative Forms: Transitive and Intransitive

Intransitive (2SG)				Transitive ($2SG_{sub}$–$3SG_{obj}$)			
cali-	'to work'	*cali*	'work'	*elag-*	'to dig'	*elaggu*	'dig it'
inarte-	'to lie down'	*inarten*	'lie down'	*kipute-*	'to buy'	*kipusgu*	'buy it'

(Jacobson 1995: 196-198)

The Participial Mood

The participial mood is realized as the morpheme *-lria* for intransitive constructions and *-ke-* for transitive constructions. The participial mood is also listed as nominalizing suffix

[16]In casual speech, however, the subordinative mood (a dependent mood), is considered a more polite form for commands, and is generally preferred (Jacobson 1995: 231-232; fieldwork notes).

(i) *tai-luku*
come-SUB.2sg
'Come [here]'

by Jacobson, but seems to have a variety of other uses.[17] For example, the participial often appears in constructions expressing surprise, as in the examples below.[18]

(13) Participial Mood

(a) Intransitive

*Tang, qava-**lria!***

look sleep-PART.3SG

'Look, she's sleeping!'

(b) Transitive

Tang, *ner-**kii!***

look eat-PART.TRANS-IND.3SG$_s$*g*-3SG$_o$

'Look, she's eating it!'

(Jacobson 1995: 384)

[17]The participial *-lria* is commonly used for [head-internal] relative clause constructions. I do not discuss this use here in terms of evidentials.

(i) *Qigmuta* *qu-**lria*** *pik-aqa*
dog bark-PART own-IND.1SG$_s$-3s$_o$
'The dog that is barking is mine.'

(Jacobson 1995: 250)

[18]While most of the uses of the participial are seen with the 3^{rd} person *-lria*, the participial also has 1^{st} and 2^{nd} person forms, however 3^{rd} and 4^{th} person are not distinguished. 1^{st} and 2^{nd} person forms with the participial do not occur as frequently as 3^{rd} person forms.

(i) *Tang,* *tupauma-**lrianga***
look awake-PART.1SG
'Look, I'm awake!'

(ii) *Yura-yu-ciq-nga-**l**-ngu-ten,* *tang!*
dance-good-FUT-be-PART-one.that.is-2SG look
'It seems you will be a good dancer, see!'

(Jacobson 1995: 386)

According to Jacobson, the participial mood has a variety of uses, which straddle the independent-dependent mood distinctions; and it is not clear from the discussion given in Jacobson which type of mood he considers the participial mood to be. The participial mood can appear as an independent mood. One of the most pervasive uses of the participial mood is what Jacobson describes as the OBSERVATIONAL CONSTRUCTION. According to Jacobson, the participial mood is used to indicate an event of seeing or observing, and often co-occurring with expressions such as *maatan* 'just when', or exclamatory expressions like *tang!* 'look!', such as in the examples given in (13a - 13b) above.

(14) *Maaten* *iter-tua* *ane-**lria***
just.when come-IND.1SG go-PART.3SG
'Just when I came in [I saw that] he went out.'

(Jacobson 1995: 382)

The participial often appears in narrative; and it is used to set the scene at the beginning of a story or narrative. This use differs from the observational construction above in the sense that it does not mark an utterance which intends to indicate something visible in the current discourse.

(15) *Kaviar-ara'url-uq* *aya-**lria*** *nanva-m* *cenii-kun*
red.fox-lonely-keep.on-ABS.3SG leave-PART.3SG lake-REL.3SG lake-VIA.3SG
'Then, they say, this poor dear fox was going along the shore of the lake.'

(Jacobson 1995: 384)

The participial mood can also be used to convey an imagined state, such as expressions with *tuar/tuarpiag* 'like/it was as if', marking simile in narrative as in (16).

(16) *tuar=gguq* *ell-mini* *qimug-tenga-mi* *sugtupia-**lria***
it.was.as.if-HRD he-ABL.4SG dog-RFLX-REL become.tall-PART.3SG
'It was, it is said, as though he had become tall because he got a dog for himself.'

(Jacobson 1995: 385)

Jacobson (1995: 385) claims that "when used with *=wa*, the participial apparently completes or explains something previously said." *=wa* is also described by Jacobson as indicating something that is taken to be understood, completing a thought, or an equivalent to "because" (1995: 281), however this is not an agreed upon definition of *=wa*.[19]

(17) **A to B:** *Cali-q'* *maan-tuten?!*
why=Y/NQ here-IND.2SG
'Why are you still here!?'
B to A: *Arenqia-la-mi-wa* *ella*
unfotunate-regularly-CONN.3SG=WA weather-ABS.3SG
'(Well it's) because the weather is the way it is.'

(Jacobson 1995: 281)

Examples with the participial mood, modal *-lli-*, and *=wa* are given below in (18), and with expressions derived from *=wa*, such as *cunawa/cunaw* 'the reason it turned out to be' (19) *waniwa/waniw* 'now, here'; *iciwa/icugg* 'you know, remember'; and *qayuwa/quayuw* 'this time'. According to Jacobson, when the participial is used with *-lli-* 'maybe' and *=wa* in the same utterance, it creates "a statement more tenuous than that formed with *-yugnarqe-* 'probably' and the indicative," (1995: 386) although it is clear what Jacobson means by "more tenuous".

[19]Some aspects of the 1995 grammar are controversial, particularly in the case of a particle such as *=wa*. My consultants disagreed with this particular definition of *=wa*, but did not provide a replacement explanation or definition.

(18) *Kuigpa-mi=<u>wa</u>* *angli-llru-lli-**lria**-ten*

river-LOC-WA grow.up-PAST-maybe-PART.2sg

'I guess you grew up on the river then.'

(BIA ANCSA Tape 77CAL012)[20]

(19) *<u>Cunaw'</u>* *snuukuu-ni* *ekua-lriit* *ekuavig-mi*

r.i.t.o.t.b. snowmachine-LOC burn-PART.3P burning.placeLOC

caniat-nun *unite-llru-<u>llini</u>-**kii***

space.to.side-TRM.3SG leave.behind-PAST-INF-PART.$3SG_s$-$3SG_o$

'The reason was that he had evidently left his snowmachine next to the things burning at the [trash] burning place.'

(Jacobson 1995: 385)

The semantic properties of participial mood and the enclitic *=wa*, are very intriguing, however this discussion must be saved for a later date.

In the next section I discuss Yup'ik evidentials. Due to the fact that Yup'ik evidentiality has scattered coding of evidentiality, where the indirect/inferential evidential *llini* is a post-base, and the reportative/hearsay evidential *gguq* is an enclitic, there seems to be some grammatical interaction between particular moods and evidentials. I first discuss the basic properties of Yup'ik evidentials, and then discuss the syntactic and semantic sensitivity with particular moods and Yup'ik evidentials.

[20]Refers to Bureau of Indian Affairs (BIA) Interview Tapes, transcriptions of Recorded Interviews for the *Alaska Native Claims Settlement Act* (ANCSA). Access to the archives was permitted by special permission from the Association of Village Council Presidents' Office (AVCP) in Bethel, AK. Citation convention here refers to the transcription file of the tape. Citations not included in bibliography.

1.1.3 Yup'ik Evidentials

Recall that Yup'ik has the inferential/inferential evidential *llini*, and the reportative/hearsay evidential *gguq*, where the choice of morpheme indicates that the proposition *She left* was learned by either by inference (20) or by having heard a previous assertion (21) by the speaker.

(20) INFERENTIAL

*Aya-llru-**llini**-uq*

leave-PAST-INF-IND.3SG

'Evidently she left.'

(21) REPORTATIVE

*Aya-llru-uq=**gguq***

leave-PAST-IND.3SG=HRD

'It is said/I heard that, she left.'

One very important (if not essential) property of evidentials, is that the evidential contribution (the evidence source for the proposition) cannot be targeted by negation (Faller 2002; Matthewson et al. 2007; Murray 2010). In spite of the fact that Yup'ik evidential morphemes are of two different morphosyntactic categories, they both share this property of evidentiality. The CHALLENGEABILITY TEST (Faller 2002) illustrates that the evidential content is not part of the asserted content of the proposition; in negating the utterance, one doesn't negate how the speaker learned of the proposition.

(22) CHALLENGEABILITY TEST (FALLER 2002): *Yup'ik*

(a) (*Qang'a*) *aya-ksaite-**llini**-uq*

(no) leave-NEG-PAST-INF-IND.3SG

= '(No) Evidently she didn't leave.'

≠ '(No) She didn't evidently leave.'

(b) (*Qang'a*) *aya-ksaite-uq=**ggɯq***

(no) leave-NEG-PAST-IND.3SG=HRD

= '(No) I heard/They say she didn't leave.'

≠ '(No) I didn't hear/They didn't say she left.'

As we see from the above, in spite of the evidentials' syntactic dissimilarity, their behavior with respect to negation is exactly the same. Faller's challengeability test is taken to illustrate that the content of the evidential is not evaluated in discourse in the same way the propositional content is (Matthewson et al. 2007, Murray 2010; Davis et al. 2007, among others). This particular aspect of evidentials is not a primary concern for the investigation here, and I do not discuss it further. The main concern here is the evidence expression of evidentials, which is independent of this issue. The evidential expression has been analyzed as a presupposition (Matthewson et al. 2007; Izvorski 1997), a not-at-issue assertion (Murray 2010), a conventional implicature[21] (Murray 2010) and a sincerity condition (Faller 2002). I refer the reader to publications listed for more on this particular topic and evidentials.

Yup'ik Inferential Evidential *llini*

The Yup'ik inferential/indirect evidential *llini* is used when a speaker has inferential evidence of an event, that he did not directly witness the event itself (e.g., the speaker has only observable evidence of the result of an event, or some other [non-visual] sensory data). It is infelicitous to use *llini* to relay a proposition about an event that the speaker has directly witnessed.[22] Jacobson (1995: 147) describes *llini* as indicating "to have V-ed, without actually being observed by the speaker."[23]

[21] Murray's comments mostly focus on Potts' (2005) formulation of conventional implicatures, but she argues that the Gricean (Grice 1975) interpretation would be problematic as well.

[22] In its pure evidential sense. This infelicity does not extend to its mirative or metaphorical use.

[23] The nominal postbase *-linraq*, which is related to *llini*, is translated as "product of N; evidence or trace of N" (Jacobson 1984: 482).

(i) *qimugte-linraq*
dog-evidence.of
'dog tracks' or 'dog feces'

(23) # *Aya-llru-**llini**-uq ...* *Tange-llru-aqa* *ayag-cess-luku*

leave-PAST-INF-IND.3SG see-PAST-IND.1SG$_s$-3SG$_o$ leave-PAST-SUB.3SG

(Intended: 'Evidently she left... [In fact] I saw her leave.')

Although the speaker does not have direct evidence for the proposition, in using the indirect/inferential evidential *llini*, the speaker is committed to believing the proposition is true; he cannot utter a proposition marked with *llini*, and then subsequently deny that he believes it as in (24) below.

(24) # *Aya-llru-**llini**-uq ...* *Aya-ksaite-llru-yuk-aa*

leave-PAST-INF-IND.3SG leave-NEG-PAST-think.that-IND.1SG$_s$-3SG$_o$

'Evidently she left ... [but] I don't think that she left.'

The examples such in (23 - 24) are argued by Faller (2006: 21) to be the "evidential variant of Moore's paradox,"[24] where an assertion of a proposition is followed by a lack of belief in the proposition.[25] According to Faller, the use of indirect evidentials indicates that the speaker does not fully know the proposition, but does indicate that they believe the proposition to be true. It's not clear however, that in the case of the direct evidential *llini* that the first clause is a plain assertion. Rather the form of the utterance seems to be *I believe based on what I perceive that it is raining and I believe that it is not raining.* Whichever interpretation is the case, we can reasonably conclude by the examples above, that the infelicity arises due to the fact that inferential evidential *llini* introduces a non-cancelable implicature that the speaker believes the proposition.

In terms of types of senses, indirect evidence sources can come in a variety of forms. For example, one could have simply observable results that an event had taken place, such as in (25).

As mentioned previously, Fortescue (2003) argues that *llini* is a perfect, related to West Greenlandic *sima*, although drawing an obvious distinction between a resultative perfect and an evidential morpheme which expresses inference from results may be difficult, if not impossible.

[24]Examples of Moore's paradox are those contradictory statements such as *It's raining but I don't believe that it is raining* or *It's raining but I believe that it is not raining*, that involve a simple assertion followed by a statement of belief of the contrary.

[25]Portner (2006) argues that the infelicity arises from an inconsistency in the common ground.

(25) *Atrayaaq-uk* *imkut* *ilak-ek* *tayim'.*
get.down-IND.DUAL their kin-REL.DUAL gone.
'When they got down their family was gone.'

Uni-llu-kek-am *aya-**llini**-lriit*
leave.behind-PAST-PART.3SG$_s$-3.DUAL$_o$-REL.3SG leave-INF-PART.3PL
'Evidently they had gone ahead without them.'

(Fienup-Riordan & Kaplan, 2007: 14)

Indirect evidence also includes non-visual sensory information, received by hearing, smell, taste or feel. This is illustrated in examples (26 - 27) below.

(26) *Qalria-lria-mek* *niit-ua,* *kegluner-tangqer-**llini**-uq* *canimarmi.*
animal.cry-PART-ABL.3SG hear-IND.1SG wolf-be-INF-IND.3SG nearby
'I heard a howl, evidently there is a wolf (nearby).'

(27) *Kiirtest-uq* *ekua-lriar-tangqer-**llini**-uq.*
hot-IND.3SG burning-PART-be-INF-IND.3SG
'I feel heat (it's hot), evidently there is a fire.'

The inferential evidential can be used to relay a conjecture about a future event, when there is something that indicates its occurrence, such as in (28).

(28) *Ellallir-ciq-llini-uq* (*iral-ut* *tungu-ameng*)
rain-FUT-INF-IND.3SG (cloud-ABS.3PL black-REL.3PL$_s$-3PL$_o$)
'Evidently it will rain (because the clouds are dark).'

Common to the examples given above for *llini*, is that there is some kind of singular evidence source that the speaker can indicate. An example of a case where *llini* is infelicitous is given in (29).

(29) Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party, but find that bottles are missing. You know that one of your colleagues, John, is quite the wine-lover.

# *Taangar-yungkeg-ami*	*John-aq*,
alcohol-lover-ABL.3SG	John-ABS.3SG
taangaq	*nange-llru-**llini**-a.*
liquor-ABS.3SG	drink-PAST-INF-IND.3SG$_s$-3SG$_o$

(Intended: 'Knowing that John is a louse, evidently he drank all the wine.')

In this case, such common knowledge does not license the use of *llini* to relay that John drank the wine, as shown by (29). It's not the case that all inferential evidence, even when observable, can be marked by using a indirect/inferential evidential such as *llini*. For example, *llini* cannot mark those propositions for which the speaker has reasoned through deductive or eliminative reasoning, which is illustrated in (30).

(30) Context: You cannot find your car keys. You have looked everywhere in your house that you have been known to find them, and they are nowhere to be found. You've decided the last place they could be is in your car. Standing in your living room, you claim the following.

# *Kelucanka*	*nunakuarcuute-mi*	*uita-**llini**-ut*
keys.ABS.3SG	car-REL.3s	be-INF-ABS.3p

(Intended: 'Evidently the keys are in my car.')

Although you have some kind of inferential, observable "evidence" in (30), it's not evidence of the sort that can license the grammatical use of the indirect/inferential evidential *llini*. This is not the only case in which certain types of indirect/inferential evidence are not felicitous cases for *llini*. For example, for predicates of taste, *llini* is impermissible in order to relay propositions about tastes that are not one's own.

(31) Context: You and a friend are walking by a restaurant window. The server has just placed a dish in front of a diner and from the looks of it, the soup looks entirely unappetizing. They have not taken a bite yet, and you have never tried the soup or even eaten at that particular restaurant.

Suup-aq *una* *neqniate-**llini**-uq*
soup-ABS.3SG this.near taste.bad-INF-IND.3SG
(Intended: 'Evidently the soup is not very tasty.')

In the case that the person served does take a bite, and makes a face that looks as if they are about to spit that morsel out, then *llini* is permissible. In the case of tastes, the second-best evidence source is someone else's tastes. Since tastes vary, however, this may not be the most reliable evidence, but it is evidence that is sufficient to license the use of *llini*.

Appearance and taste may not be as correlated as we may presume them to be, as even though something may look unappetizing, it doesn't indicate that it does taste horrible. If appearance and taste, or even smell and taste (such as stinky cheeses or fish), did correlate, then we probably would not eat and enjoy the taste of many of the foods that we do!

Morphosyntactic Constraints of *llini*

llini is a post-base, a verbal suffix. The Yup'ik modals *-lli-* 'maybe/perhaps' (32) and *-yugnarqe-* 'might/maybe/probably' (33) are also postbases.[26]

(32) *kuigpa-mi=wa* *angli-llru-**lli**-lria-ten*
river-LOC-WA grow up-PAST-maybe-PART.2SG
'I guess you grew up on the river then.'

(BIA ANCSA Tape 77CAL012)

[26]It is possible that *llini* could also be considered an epistemic modal, which Yup'ik seems to lack. The focus of this dissertation is on the evidential signal, and not whether evidentials should be considered modals, and thus this issue is not discussed here.

(33) *Aya-llru-**yugnarq**-uq*

leave-PAST-maybe-IND.3SG

'She probably left.'

(Jacobson 1995: 146)

The Yup'ik evidential *llini* seems to be in complementary distribution with the above modal verbs, as *llini* cannot grammatically co-occur with the modals *-lli* or *-yugnarqe*. This is illustrated in (34 - 35).

(34) **Aya-llru-**lli-llini**-uq*

leave-past-maybe-INF-IND.3SG

(Intended: 'She maybe evidently left.')

(35) **Aya-llru-**yugnarq-llini**-uq*

leave-past-maybe-INF-IND.3SG

(Intended: 'She probably evidently left.')

llini and the reportative/hearsay evidential *gguq*, however, can co-occur. Due to the scattered coding of evidentiality, the inferential evidential *llini* can be embedded under the reportative evidential *gguq*, since *gguq* an enclitic.

(36)	*tuai=llu=**gguq***	*tauna*	*massiinaq*	*arulairr-**llini**-lria*
	and.then=and=HRD	that	machine-ABS.3SG	stop-INF-PART.3SG

'And then, that machine [motor] stopped.'

(Sellman 1996: 109, M 037-9)

In (36) above, the narrator is telling a story through the eyes of the character. *=gguq* appears often in narrative and story-telling contexts. In such cases, the 'evidently' goes with the character in the story, not with the narrator. This use of *llini* under the reportative

enclitic does not indicate that the character actually used the evidential.[27] In fact, in the cases such as the above, it seems that the use of *gguq* is more a convention of story-telling than as evidential.[28]

In terms of Yup'ik mood, *llini* often appears with the indicative and participial moods.

(37) Indicative Mood

*Aya-llru-**llini**-uq*

leave-past-inf-ind.3sg

'Evidently she left.'

(38) Participial Mood

Uni-llu-kek-am	*aya-**llini**-lriit*
leave.behind-past-part.3sg$_s$-3dual$_o$	leave-inf-part.3pl

'Evidently they had gone ahead without them.'

(Fienup-Riordan & Kaplan, 2007: 14)

llini can occur grammatically in questions marked with the interrogative particle *=qaa*, or the interrogative mood, although these constructions are considered marked.

(39) Yes/No Question (Interrogative Particle)

*neqniate-**llini**-uq-qaa*?

tastes.bad-inf-ind.3sg=y/nQ

'Does the soup evidently taste bad?'

(40) WH-Question (Interrogative Mood)

kina	*qanrute-llru-**llini**-siu?*
who-abs.3sg	tell-past-inf-int.2sg$_s$-3sg$_o$

'Who did you tell?'

[27] Sellman analyzes *llini*, or more specifically the use of *llini*+participial/subordinative moods as indicating an important point in the story.

[28] Embedding of direct and indirect evidentials under reportative evidentials is not uncommon; the direct/indirect evidential can be embedded under the reportative evidential in languages such as Amdo Tibetan and Cochabamba Quechua (Krawczyk 2009).

llini cannot, however, occur with the optative mood. The ungrammaticality of this construction does not seem to be due to syntactic constraints as the optative mood does not differ from the indicative or interrogative mood in terms of its syntax.

(41) **Ampi-**llini**-∅*

hurry-INF-OPT.2SG

(Intended = 'Evidently hurry up')

The imperative seems to be the only case discussed here where the ungrammaticality of *llini* arises from a semantic and not a syntactic restriction. Those cases where the ungrammaticality of the inferential evidential *llini* is syntactic in nature are not the same as those cases where the reportative evidential *gguq* is found to be ungrammatical due to constraints on the syntax, as *gguq* is of a different morphosyntactic category.

Yup'ik Reportative Evidential *gguq*

The Yup'ik reportative evidential *=gguq* is used to report what someone has said, but can also be used to report what someone has heard from a particular person, by rumor or having read it somewhere (a newspaper, book or magazine). The enclitic *gguq* is generally translated as 'it is said/they say/I hear' (Jacobson 1995), where the agent of saying is left unspecified.

(42) *Aya-llru-uq=**gguq***

leave-PAST-IND.3SG=HRD

'It is said she left.'

The reportative/hearsay evidential *gguq* is similar to the Cheyenne reportative evidential (Murray 2010: 27-40), and the Cuzco Quechua reportative evidential *-si* (Faller 2002: 18-21; 189-204), as in utterances with the reportative/hearsay evidential *gguq* the identity of the original speaker of the proposition cannot be indicated explicitly.[29] Rather, the source is

[29]The Cheyenne reportative evidential is not a single, fixed-form morpheme; it inflects for person, number, and argument position.

left unspecified. In fact, there is no way to grammatically indicate the speaker with *gguq* without an additional verb 'say'.[30]

(43) **John-aq-**gguq*** *Mary-aq* *aya-llru-uq*
John-IND.3S=HRD Mary-IND.3S leave-PAST-IND.3S
(Intended: 'John said Mary left.')

The following example illustrates that *gguq* also can indicate reported speech, where its use does not seem to be evidential. An example case is given below, where an intermediary relays an entire discourse between a mother and son.[31] Note that the verb 'say' appears in some of the examples but not others. In (44b), there is no verb 'say', as the proposition *Your son is hungry* is marked only with *=gguq*. It is interpreted, however, as the son who says he is hungry.[32]

(44) Reportative Evidential as Speech Report

(a) son to intermediary

*kaig-tua=**gguq*** *qanrus-kiu* *aanaka*
hungry-IND.1SG=HRD say-OPT.2SG$_s$-3SG$_o$ mother-IND.3SG$_s$-3SG$_o$
'Tell my mother that I'm hungry.'

(i) Cheyenne Reportative Evidential Forms (Murray 2010: 243)

-máse	-RPT.1SG.A, -RPT.2SG.A	-nése	-RPT.SG.B (subject position)
-mánése	-RPT.1PL.A	-nésestótse	-RPT.PL.B (subject position)
-mánése	-RPT.1PL.A	-nóse, -se	-RPT.SG.B (object position)
-mése	-RPT.2PL.A	-nésestótse, sestótse	-RPT.PL.B (object position)
-séstse	-RPT.3SG.A		
-sesto	-RPT.3PL.A, -RPT.3OBV.A		

[30]This can be done by adding an additional word with *qaner-* 'say", but the postbase *-ni-*, which is similar to English 'do', which can also function like 'say' in a subordinate clause.

[31]Note some speakers are more productive in their use of *gguq* than others. Some very rarely use it (and therefore had difficulty providing examples; others use it often.

[32]*Akutaq* (also spelled *agutaq*), or 'Eskimo Ice Cream', consists of berries, fat/lard and sugar (optional).

(b) INTERMEDIARY TO MOTHER

*kaig-tuq=**ggug*** *qeturaa-n*

hungry-IND.3SG=HRD son-REL.3SG$_s$-3SG$_o$

'Your son says that he is hungry'

(c) MOTHER TO INTERMEDIARY

*Ner-li=**ggug*** *akuta-mek*

eat-OPT.3SG=HRD akutaq-REL.4SG

'Tell him that he may eat akutaq.'

(d) INTERMEDIARY TO SON

*Ner-i=**ggug*** *akuta-mek*

eat-OPT.2S=HRD akutaq-REL.4SG

'She says for you to eat akutaq.'

(Jacobson 1995: 210)

The use of a reportative evidential may be considered a reported speech strategy, as a way to relay a previously-asserted utterance (Aikhenvald 2004). Reportative evidentials are not examples of direct speech reports; and propositions marked with reportative evidentials do not shift indexicals back to the original context (Murray 2010; Faller 2002). As we see in the example below, the first person pronoun and the temporal expression is evaluated in the current, reporting context.

(45) SHIFTABILITY AND THE REPORTATIVE EVIDENTIAL: *Yup'ik*

On Tuesday:

*Iqua-llru-tua-**ggug*** *akwaugaq*

pick.berries-PAST-IND.1SG-REP yesterday

'It's said I picked berries yesterday.'

yesterday = Monday, *Sunday;

I = current speaker, *speaker of original report

Exceptions are those shiftable expressions in utterances marked with the REPORTATIVE evidential in the context of a story or narrative. Indexicals, such as personal pronouns, do not shift, but those items we could possibly categorize as "point of view" adverbials, such as the inferential evidential *llini* 'apparently' and *maaten* 'suddenly, abruptly', seem to. When the Yup'ik inferential evidential *llini* is embedded under the reportative *gguq*, the inferential evidential *llini* is associated with the character in the story, not the narrator. The example below (46) is from "The Motor Story" (Sellman 1996).

(46) SHIFTABILITY OF THE INFERENTIAL EVIDENTIAL

*tuai=llu=**gguq***	*tauna*	*massiinaq*	*arulairr-llini-lria*
and.then=and=HRD	that	machine	stop-INF-PL.3S

'And then, that machine [motor] stopped.'

(Sellman 1996: 109, M 037-9)

Demonstratives, such as *yaani* 'there' or *paagaa* 'up there', also seem to be able to be evaluated with respect to the context of the story, and not necessarily the context of utterance. Take another example from the story "The Little People" (Sellman, 1996).

(47) SHIFTABILITY OF LOCATIVE EXPRESSIONS

(a)

*yaa-i-**gguq***	*amiik-t*
over.there=HRD	door-P

'Over there are the doors.'

(b)

*pagaa-ni-llu-**gguq***	*cali*	*amiik*
up.there-LOC=and=HRD	also	door

'And above it, another door.'

(Sellman 1996: 103, L 066, 068)

These adverbs and demonstratives do not shift when not in a narrative (story) context, such as in the context of an interview, as given in (48).

(48) Lack of Shiftability of *gguq*

Context: You are interviewing speakers in Eek, AK. An elder, Anna, spent her childhood across the river in Tuntutuliak, AK, and so you are asking her questions about Tuntutuliak in the old days.

*Pissur-yar-aq-**gguq*** *wani* *assir-tuq.*

hunting-to.go-NOM-HRD here be.good-IND.3sg

'They say hunting was good here.' (= Eek, #Tuntutuliak)

In the above, *wani* 'here' can only be interpreted as Eek, the location of the interview, and not Anna's hometown of Tuntutuliak, even though the statement is about hunting during the time in her childhood.

In narrative or story contexts, *gguq* may not have the same evidential meaning as it does in conversation. The REPORTATIVE *gguq* has been analyzed as a way to set the narrative scene, or introduce a story context (Sellman 1996). Sellman (1996: 100) claims the following about *gguq*.

> In addition to the functions mentioned by both Jacobson and Miyaoka, the enclitic *=gguq* also appears to be an important ingredient in the narrative formula of traditional stories, just as 'once upon a time...' and 'and so...' are essential elements in the structure of our own fairy tales. In most cases, *=gguq* occurs at important junctures in the tale and serves to move the story on by encapsulating the next utterance in the traditional 'and so, they say...'. It would also indicate to the listener that this event occurred in the past, often imparting to it a mythical quality. As a result, certain combinations of particles with *=gguq* have become lexicalized as formulaic expressions in Yup'ik narratives.
>
> (Sellman 1996: 100)

It seems like there is something exceptional that occurs in story and narrative. In the Yup'ik narrative cases, it seems that *gguq* can occur in these shifted cases, where the narrator

indicates that the context of evaluation is the story world and not the reporting context. Evidentials, when used in narratives, can be used for additional functions (see Sellman (1996) for a discourse analysis style account of the use of Yup'ik evidentials *gguq* and *llini* in narratives).[33]

Multiple reports can be combined and marked with a single instance of *gguq*, if they relay propositions that are regarded as expressing similar propositional content.[34] Consecutive reports, as in a narrative, are assumed by the addressee of the utterance to have come from the same source, unless indicated otherwise.

If consecutive reports are conflicting propositions, then they cannot be combined and marked with a single instance of *gguq*, or in consecutive *gguq*-marked utterances in narrative without the introduction of a new speaker. An example of such a case would be if two reports of different winners of the annual mushing (dog sled) race, the *Kuskokwim 300* (K300), such as in (49) were relayed with one instance of *gguq*. This restriction on the reportative evidential

[33]One possible explanation that may account for these shiftability facts and *gguq*, is that in story contexts, *gguq* can function to relay a type of free indirect discourse (FID). FID is a narrative device used in literature in which the narrative shifts perspective in order to convey a character's thoughts or feelings.

(i) Free Indirect Discourse: Example

> John slowly rowed up to the start line, the only perceptible sound were that of his blades entering and exiting the water. The lake was as quiet as always, belying the intensity of the event. There was a slight headwind, and it set the boat up nicely. This was good– it is going to be a fast course today.

As we see in the above example in (i), the reader is shifted into the perspective of John. The reader senses what John senses: the lone sound of the oars and the water, the set of the boat, the slight breeze of the wind to his back, the excitement that the race would be run with a tailwind. Additionally the adverb *today* in (i) is interpreted with respect to John and the context of the race. This shift, to the perspective of the character, is not done with any particular overt operator, and it is not clear what does the "shifting" in these cases. Sharvit (2008) argues that FID is an attitude report, due mainly in part to the ability for FID to take on a *de se* interpretation. Oshima (2006: 15, fn, 5) also notes that in English FID, only a subset of indexical expressions, such as *today*, but not personal pronouns, can shift.

[34]Again, how this similarity is determined is not quite clear.

is also found in Cheyenne (Murray 2010: 28), where a verb of saying must intervene to relay the propositions, or mark the propositions distinctly.[35]

(49) Conflicting reports with *gguq*

*# John-aq=**gguq*** *K300* *qakvar-tuq,* *Bill-aq=llu* *K300* *qakvar-tuq*

John-ABS.3SG=HRD K300 win-IND.3SG Bill-ABS.3SG=and K300 win-IND.3SG

(Intended: 'It's said that John won the K300 and Bill won the K300')

Perhaps due in part to the fact that the reportative does not overtly link the proposition to the reporter, consecutive conflicting reports are often interpreted as coming from the same speaker. Conflicting reports may be interpreted as a report of someone who has asserted that the proposition is both true and not true. This restriction on the reportative is unexpected, because unlike the indirect/inferential evidential *llini*, the reportative/hearsay evidential *gguq* does not require that the speaker believes the embedded proposition, and thus the speaker should be able to relay two conflicting reports.

(50) Deniability: *gguq*

*Aya-llru-uq-**gguq*** ... *Aya-ksaite-llru-yuk-aa*

leave-PAST-3S-HRD l leave-NEG-PAST-think.that-IND.1S$_s$-3S$_o$

'It is said that she left... I don't think that she left.'

The example in (50) illustrates that the reportative evidential is unlike other evidentials, in that the reportative evidential removes the commitment of speaker belief in p, as he may subsequently claim that they do not believe or think p to be true.

Morphosyntactic Constraints of *gguq*

The reportative *gguq* is an enclitic, unlike the inferential evidential *llini*, the reportative *gguq* can co-occur with the Yup'ik modals *-yugnarte-* 'probably', but not *-lli-* 'maybe', although

[35] According to one consultant, in Yup'ik one may perhaps mark one of the reports with *-lli-* 'maybe' or *-yugnarte-* 'probably'.

these constructions appear to be highly marked, as indicated by the speaker's comments included with the example.

(51) # *Aya-llru-yugnarq-uq=**gguq*** *John-aq*
leave-PAST-maybe-IND.3SG=HRD John-ABS.3SG
'It is said John probably left.'

Speaker's Comment:
"If I were super unsure, but remember someone telling me he might have left."

The example in (36) illustrated that *gguq* can mark a proposition relayed with the inferential evidential *llini*. This construction is quite common, appearing most often in narratives. In fact, *gguq* can co-occur with all (independent) moods. We have seen many examples with the indicative.

(52) INDICATIVE MOOD
*Aya-llru-uq=**gguq***
leave-PAST-IND.3SG=HRD
'They say she left.'

gguq can mark content/WH-questions, which are not marked with the interrogative enclitic *qaa*, but rather marked by the interrogative mood and a WH-form, a construction that appears frequently.

(53) INTERROGATIVE MOOD
*Ciin=**gguq***?
why=HRD
'Why do they say it's so?'/
'Why, would you say, it is so?'

(Jacobson 1995: 209)

The reportative evidential *gguq*, when it appears without the inferential evidential, however, is highly marked (if not infelicitous), when marking a proposition with the participial mood in an observation construction.

(54) Participial Mood

#?*Maaten=**gguq***	*iter-tua*	*ane-lria*
just when	come-IND.1SG	go-PART

'Just when I came in [I saw that] he went out.'

Speaker's Comment:

"Seems really weird, unless this came from a truly old Yup'ik story."

Unlike *llini*, the reportative *gguq* can mark propositions in the optative mood; and this construction occurs frequently.

(55) *Ampi=∅-**gguq***

hurry-OPT.2sg=HRD[36]

"'Hurry up," he says.'/ 'He says for you to hurry up.'

'They say hurry up.'[37]

(Jacobson 1995: 209)

In normal conversational speech, *gguq* cannot co-occur with questions that marked by the enclitic *=qaa*. Both the reportative evidential *gguq* and *qaa* are enclitics.

(56) * *Pani-in-qaa-**gguq*** *elitnaurvig-mi*?

daughter-POSS.2SG	school-LOC

(Intended: 'Is it said [that] your daughter is in school?')

This constraint may not be entirely syntactic. In narratives *=wa* and *=gguq* can both co-occur together on the same lexical item, even though *=wa*, like *=gguq* are both enclitics.

[36]This could also be 2PL; 2PL and 2SG have the same form.

[37]Native speaker translation.

(57) *Tua-lli-wa-**gguq*** *una...*

then-maybe=WA=HRD that.one.down.there

'And then this one...'

(Jacobson 1995: 285)

Certain contexts, such as stories and narratives, seem to allow for certain constructions that do not otherwise appear in casual, conversational speech.[38] The enclitics *=gguq* and *=qaa* are in complementary distribution entirely, either. The following example contains what appears to be a concatenated form, *gguq-qaa*. The use of *gguq* + *qaa* in the example in (58) does not have the interpretation 'Is it said, do you have to go to church?'. Rather the use of *gguq-qaa* serves to indicate that the translator is asking the question on behalf of someone else (a non-Yup'ik interviewer).[39]

(58) TRANSLATOR'S *gguq+qaa*

*Agayuyar-yug-tuten-**gguq-qaa***?

church-want-IND.2S=HRD-Y/NQ

= 'Are you going to church?'

≠ 'Is it said, do you have to go to church?'

(BIA ANCSA: 77CAL012)

It is not clear whether these double enclitic forms *gguq-wa* and *gguq-qaa* are idiomatic or formed derivationally. Due to the fact that their appearance is limited to certain contexts, we may assume that these forms are idiomatic. In either case, due to the fact that *gguq* is a different type of affix than *llini*, it is subject to different morphosyntactic constraints.

[38] These double enclitic forms have proved to be difficult, if not impossible, to elicit from speakers.

[39] Since this construction seems to be limited to this use as a translator's convention, I refer to the construction as the "Translator's *gguq*", which I have only come across in the recordings of the Bureau of Indian Affairs (BIA) interview tapes.

1.1.4 Summary: Yup'ik Eskimo Evidentiality

As we see from the examples above, *llini* is an inferential evidential that has some more specific requirement on what can license the inference expressed. *gguq* is a reportative evidential, where the speaker need not believe the proposition marked with *gguq*, nor may he indicated the original speaker of the utterance overtly. In terms of their evidential signal and morphosyntactic restrictions, I summarize the above discussion with respect to Yup'ik evidentials and their interaction with other grammatical categories in the following table.

Evidential	Belief Req.	With Modals	Yes/No Q	Yup'ik Moods			
				IND	INT	OPT/IMP	PART
llini	yes	no	yes	yes	yes	no	yes
gguq	no	yes	no	yes	yes	yes	yes

Table 1.1: Summary of Yup'ik Evidentials and Restrictions

1.2 English Evidentiality

English is usually considered a language which lacks evidentiality, as it does not possess functional morphemes that specifically mark a speaker's evidence source for a proposition. That is not to say that English does not have expressions that have evidential meaning, but that it is not normally analyzed as a language that has a morphological, evidential system. The position that English has evidential expressions is not completely novel (see: Chafe 1986; Ifantidou 2001; Taranto 2006; Izvorksi 1997), but one of the main goals here is to show that the English adverbs *evidently, apparently, supposedly, reportedly* and *allegedly*,[40] pattern nearly identically to evidentials, especially when directly compared to Yup'ik. In this section I illustrate the parallel semantic behavior of English evidential adverbs to Yup'ik evidentials

[40]The discussion here could also include the English slifted constructions *it's said, they say, I hear* (as well as *seems like, looks like,* and *sounds like*, to name a few more that are non-hearsay), and how they relate to evidentiality, however discussions of these particular types must be put off for a later time.

to illustrate that English adverbs exhibit the same semantic restrictions on use. This process of direct comparison provides a more concrete argument for why these particular English adverbs should be considered evidentials.

Similar to other evidentials, such as Yup'ik *llini* and *gguq*, the English adverbs *evidently*, *apparently, reportedly* and *supposedly* are all outside the scope of negation.

(59) My keys evidently/apparently aren't in my car.

(≠ It's not apparent/evident that my keys are in my car.)

(60) My keys supposedly/reportedly aren't in my car.

(≠ It's not supposed/reported that my keys are in my car.)

Here, negation does not target the evidential content. Only the metalinguistic negation of the adverb, *My keys aren't evidently in my car... I know they are!* is available when there is particular emphasis on the adverb (indicated by intonation), which is distinct from *It is not the case that it is evident that my keys are in my car.*[41]

[41]It would appear that this construction does negate evidential content. One aspect of this utterance to take note of is that we have altered the evidential *evidently/apparently* to *evident*. If we look closely, however, it is not clear what is being negated. It appears that the negation seems to be targeting a presupposition; we can imagine a few different continuations to this utterance, and all seem to be infelicitous.

(i) #? It is not the case that it is evident that my keys are in my car... but it is obvious/clear.

(ii) #? It is not the case that it is evident that my keys are in my car... I was hallucinating.

(iii) ? It is not the case that it is evident that my keys are in my car... but it is reported/alleged.

(iv) ? It is not the case that it is reported/alleged that my keys are in my car... but it is evident.

(v) It is not the case that it is evident that my keys are in my car... they actually are/aren't!

I discuss the example in (1) when I discuss Taranto's (2006) proposal for the discourse adjectives *clear, obvious* and how they differ from *evident/apparent* 4.4. From the above examples It does not seem that we can negate the evidential and then assert something about the context that would render the evidence false as in 2. It is also not the case that we can deny one type of evidential and assert another (3 - 4). It seems that the only the continuation that is felicitous is the metalinguistic one (5). It seems that to deny one type of evidence is to deny them all. In this case, this negation seen here is still not true propositional negation, as it only targets a presupposition of evidence (that the speaker not know something to be true). The proposal here does explain why (3) and 4 are infelicitous, but the issue of the nature of the interaction between negation and propositional modifiers remains unexplained.

1.2.1 English Inferential Evidentiality: *Evidently* and *Apparently*

English *evidently* and *apparently* have a very similar distribution to the Yup'ik inferential evidential *llini*. A similar discussion can be found in Izvorski (1997) for the parallels of *apparently* and the Bulgarian evidential perfect (or PE). English *evidently* and *apparently*, similar to *llini*, are not felicitous in the case where one knows the proposition to be true.[42]

(61) # I know he left ... Evidently/apparently he left.

Evidently and *apparently* also have a very similar distribution with *llini* with respect to the types of inferential evidence that the adverbs can express. For example, *evidently* and *apparently* can indicate the speaker has observable results of an event that they did not witness themselves, such as in (62).

(62) (The street is wet.)
Evidently/Apparently it rained.

Evidently and *apparently* can also mark auditory evidence (63), or sensory evidence, such as smell in (64).

(63) (You hear some loud music playing down the street and people shouting.)
Evidently our neighbors are having a party.

(64) (You come home and your house smells of natural gas.)
Apparently I left the oven on.

Like Yup'ik *llini*, *evidently* and *apparently* vary with respect to their use in conjectural contexts. For example, in the case of observable evidence, such as the scenario where black clouds loom overhead, it would not be infelicitous to say (65).[43]

(65) Evidently/Apparently it is going to storm.

[42] Again, in a non-mirative way.

[43] Speakers note that they would prefer a different construction, such as *It looks like it will rain.* They do not, however, claim that it is infelicitous to use *evidently* or *apparently* in this case.

Recall the scenario where you are the one designated to keep the box of wine bottles in your office for the department welcome party, and you find a box full of empty bottles. Similar to *llini* in (29), it is infelicitous to say (66) below.

(66) Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party. You find that are bottles missing from the box. One of your colleagues John, is known to be quite the wine-lover.

Evidently/Apparently John drank all the wine.

The problem with the use of *evidently* and *apparently* in (66) is the same as that for *llini* in (29): there is no actual evidence that explicitly points to John, just that you know of John's habits. Were you to take a peek into John's office and find one of the empty wine bottles, (66) would be felicitous.

Also similar with respect to the Yup'ik inferential evidential *llini*, *evidently* and *apparently* cannot be used to express propositions which the speaker has reasoned by deduction or elimination. Recall the scenario where you have misplaced your car keys, you cannot relay this inference that they are in your car with *evidently* and *apparently*, as shown in (67).

(67) Context: You cannot find your car keys. You have looked everywhere in your house that you have been known to find them, and they are nowhere to be found. You've decided the last place they could be is in your car. Standing in your living room, you claim the following.

Apparently/Evidently my keys are in my car!

Although you have some kind of "evidence", it's not evidence that will license the grammatical use of the indirect/inferential evidential *evidently* or *apparently*. Note, however, that in the same case, the proposition relayed with English epistemic necessity modal *must* is felicitous.

(68) My keys must be in my car!

It is not the case that the inference is weak, that the keys are only possibly in your car. If it were the case that the inference were weak, then the epistemic necessity modal *must* should be infelicitous. This is not the case; in terms of strength of inference alone, the above example does not indicate that there is a difference between *evidently* or *apparently* and *must*.

Also similar to *llini*, *evidently* and *apparently* cannot be used for predicates of taste for which the speaker cannot attest. Recall the scenario where you walk by the window of a restaurant. Here also, *evidently* or *apparently* cannot be used in this case to indicate that the dish tastes disgusting.

(69) Context: You and a friend are walking by a restaurant window. The server has just placed a dish in front of a diner and the soup looks entirely unappetizing. The diner has not tasted the soup yet. You also have not ever tried the soup, or even eaten at that particular restaurant.

(a) *Visual appearance of the food only*:

Evidently/Apparently that dish tastes disgusting.

(b) *The consumer of the food makes a twisted face; spits out the food*:

Evidently/Apparently that dish tastes disgusting.

In both the (69a) and (69b) cases, the modal *must* is fine.

(70) Context: You and a friend are walking by a restaurant window. The server has just placed a dish in front of a diner and the soup looks entirely unappetizing. The diner has not tasted the soup yet. You also have not ever tried the soup, or even eaten at that particular restaurant.

(a) *Visual appearance of the food only*:

That dish must taste disgusting.

(b) *The consumer of the food makes a twisted face; spits out the food*:

That dish must taste disgusting.

Similar to *llini*, *apparently* and *evidently* cannot be used to mark a proposition about how something tastes when one's only evidence is its appearance.

Evidently, Apparently AND SYNTACTIC CONSTRAINTS

Unlike Yup'ik *llini*, English adverbs *evidently* and *apparently* can felicitously co-occur with some epistemic modal verbs, such as the epistemic necessity modal *must*.[44]

(71) Evidently John must be the murderer.

(72) Apparently my keys must be in my car.[45]

The only epistemic modal that is felicitous with *evidently* and *apparently* is *must*; *might* and *should* are both infelicitous.

(73) # Evidently/Apparently my keys should be in my car.

(74) # Evidently/Apparently my keys might be in my car.

At this time, I do not offer an analysis for the above facts with respect to modals and evidential adverbs in English, but this is possibly a fruitful area of future research at the interface of evidentiality and epistemic modality.

These adverbs can also be stacked, as illustrated in the example below.

(75) Turns out he was *apparently, supposedly* channelling the author Philip Roth...[46]

The adverbs *evidently* and *apparently* can be used grammatically in questions, both polar interrogative and content questions alike. These constructions appear to be highly marked to most speakers.

[44]This combination is actually permissible in the lost keys scenario, see (67).
[45]Some speakers object to this example without particular stress on *must*.
[46]http://lessercolumn.blogspot.com/2011/08/hello-darkness-sam-de-brito.html

(76) Polar Questions

(a) Did John evidently go to the party?

(b) Did Ben apparently win the race?

(77) Content Questions

(a) Where did John evidently go?

(b) Who apparently won the race?

These adverbs, however, seem to be infelicitous with simple imperatives. Utterances with deontic modals, however, appear to be acceptable.

(78) Imperatives

(a) # Evidently go to the store.

(b) # Apparently leave!

(79) Deontic Modals

(a) Evidently you should go to the store.

(b) Apparently you must leave![47]

Distinguishing *Apparently* and *Evidently*

I do not distinguish between *evidently* and *apparently*, and treat them as essentially equivalent in terms of their evidential semantics. From this point on, I refer to these adverbs jointly as *evidently/apparently*. One does, however, feel as though there is a difference between the two, yet there does not seem to be much evidence that unequivocally shows these expressions are distinct.

[47]Some speakers accept this, but prefer *need to* or *have to* instead of *must*.

One difference between the two adverbs seems to be frequency of use in spoken discourse. For example, in the Fisher Spoken Corpus[48] there were 860 occurrences of *apparently*, but only 127 occurrences of *evidently*. Perhaps then, we would posit that *apparently* is more colloquial than *evidently*. If this were the case, we would expect to see an inverse distribution pattern for *apparently* and *evidently* in academic or scientific writing. The data, however, do not show this to be the case: a search in the American National Corpus (ANC) in the BioMed subcorpus, yielded 194 uses of *apparently* and only 5 instances of *evidently*. It seems that simple frequency of use across different genres does not target the difference between *apparently* and *evidently*.

We could imagine that a possible argument is that the difference between the two adverbs could be that of commitment, where *apparently* merely describes how things appear to be on the surface, *evidently* expresses that there is some kind of evidence, and conveys that a stronger inference has been made. This intuition also does not seem to be borne out in the data, as utterances with either *apparently* or *evidently* can be subsequently denied; and both *apparently* or *evidently* can take on a reportative meaning when this occurs.

(80) Apparently it snowed in Dallas in July . . . But I don't believe it.

(81) Evidently it snowed in Dallas in July . . . But I don't believe it.

From the two initial tests here, it is not entirely transparent how *apparently* and *evidently* differ. For the remainder of the discussion, I assume that their semantic overlap is nearly complete, and thus consider their evidential semantics indistinct.

[48]Published 2004 by the Linguistic Data Consortium (LDC) at the University of Pennsylvania. It includes 16,000 conversations, and was funded by DARPA EARS program. See Cieri, Miller & Walker (2004).

1.2.2 English Inferential Evidentiality: *Clearly* and *Obviously*

The adverbs (or adjective forms of) *clearly* and *obviously* have been argued to carry an evidential signal. An evidential scenario for *clearly* and *obviously* from Barker & Taranto (2003) and Barker (2009) is given below.[49]

(82) Context: We have two photographs before us. One, labeled 'Nawal', shows a grave young woman in ordinary clothes. The other, labeled 'Abby', shows a different young woman wearing a white lab coat with a stethoscope around her neck.

(a) # Clearly, Nawal is a doctor.

(b) Clearly, Abby is a doctor.

Barker (2009) argues that in the above, the use of *clearly* in the case of Nawal is infelicitous because a grave expression is not taken to be a decidedly clear indication of one's being a doctor. On the other hand, the wardrobe of a lab coat and stethoscope is indicative of Abby possibly being a doctor, but Abby wearing a lab coat does not confirm she is in fact a doctor, as Abby could be an actress and only play a doctor on TV. *Clearly* and *obviously* behave very similar to *apparently/evidently* in the environments given previously. For example, if the speaker has direct knowledge of a proposition being true, then marking a proposition with *clearly/obviously* is infelicitous, as shown in (83).

(83) # I know he left . . . Clearly/obviously he left.

Clearly and *obviously* can indicate the speaker has observable results of an event that they did not witness themselves, such as in (84).

(84) (The street is wet.) Clearly/Obviously it rained.

The type of sense that can associate with *clearly* and *obviously* seems to differ from that of *apparently/evidently*, as illustrated in the examples below.

[49]The original example is for the discourse adjective *clear*. I have changed their example slightly, modifying the adjective form *clear* to the adverb *clearly*.

(85) (You hear some loud music playing down the street and people shouting.)

Obviously our neighbors are having a party.

(86) (You come home and your house smells of natural gas.)

Clearly I left the oven on.

Clearly and *obviously* are also infelicitous in conjectural contexts, even those where *llini* or *apparently/evidently* were permissible. For example, in the case where black clouds loom on the horizon, *clearly* and *obviously* may be felicitous only in the case where the proposition is a topical matter of debate in the discourse, and not otherwise. This property of *clearly* and *obviously* is important, and I return to this aspect of these adverbs again in subsequent chapters.

(87) Context: Dark, black clouds loom overhead.

(a) Out of the blue:

Clearly/obviously it is going to storm.

(b) Debating whether or not it will rain:

Clearly/obviously it is going to storm.

Clearly and *obviously* are infelicitous for typical conjectural scenarios, such as in the case where you are the one designated to keep the box of wine bottles in your office for the department welcome party.

(88) Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party, but find that some bottles are missing. One of your colleagues, John, you know is quite the wine-lover.

Clearly/obviously John drank all the wine.

If you were debating about who took the wine, and you to take a peek into John's office and find one of the empty wine bottles, perhaps (88) would be felicitous.

Clearly and *obviously* cannot be used to express propositions which the speaker has reasoned by deduction or elimination, such as the scenario where you have misplaced your car keys.

(89) Context: You cannot find your car keys. You have looked everywhere in your house that you have been known to find them, and they are nowhere to be found. You've decided the last place they could be is in your car.
Standing in your living room, you claim the following:
Clearly/Obviously my keys are in my car!

Although you have some kind of evidence, it's not evidence that will license the grammatical use of the indirect/inferential evidential *clearly* or *obviously.*

Similar again to *llini* and *evidently/apparently*, *clearly* and *obviously* cannot be used for predicates of taste for which the speaker cannot attest, such as the restaurant window scenario. In this case, neither *clearly* nor *obviously* can be used in this case to indicate that the dish tastes disgusting based on appearance.

(90) Context: You and a friend are walking by a restaurant window. The server has just placed a bowl of soup in front of someone, and the soup looks entirely unappetizing. This person has not yet tried the soup. You have also never tried that soup, or even eaten at that particular restaurant.

(a) *Visual appearance of the food only*:
Clearly/obviously that dish tastes disgusting.

(b) *The consumer of the food makes a twisted face; spits out the food*:
Clearly/Obviously that dish tastes disgusting.

Clearly, Obviously and Morphosyntactic Constraints

The only epistemic modal with which *clearly* and *obviously* are felicitous is epistemic *must* (91 - 92).

(91) Clearly, John must be the murderer.

(92) Obviously, my keys must be in my car.[50]

Modals other than *must* are not felicitous, as shown in examples (93 - 94).[51]

(93) # Obviously my keys should be in my car.

(94) # Clearly my keys might be in my car.

These adverbs can grammatically be used in questions, both polar and content questions alike. Similar to *evidently/apparently*, these constructions seem to be extremely marked.

(95) Polar Questions

(a) Did John clearly go to the party?

(b) Did Ben obviously win the race?

(96) Content Questions

(a) Where did John clearly go?

(b) Who obviously won the race?

[50] Again, so speakers claim that in this case, there must be some kind of stress on *must* to make this example truly felicitous.

[51] One can perhaps imagine a scenario where you and a friend are debating about the possible locations where your keys could be. In this case, however, the "evidence" one would use would be different. The utterance would also require a different intonational contour in these cases as well.

(i) Clearly, my keys *might* be in my car... Because I haven't looked there yet.

(ii) Obviously, my keys *should* be in my car... Because I leave them there everyday... But they aren't.

These adverbs, however, seem to be infelicitous with simple imperatives, but note that utterances with deontic modals are felicitous. Unlike epistemic modals, where only *must* was felicitous, in the case of deontic modals, deontic *must* and *should* are both felicitous.

(97) Simple Imperatives

(a) # Clearly go to the store.

(b) # Obviously leave!

(98) Deontic Modals

(a) Clearly you should go to the store.

(b) Obviously you must leave!

Unlike *apparently/evidently*, however, propositions marked with *clearly* and *obviously* cannot be uttered and subsequently denied and take on a reportative meaning.

(99) # Clearly it snowed in Dallas in July ... But I don't believe it.

(100) # Obviously it snowed in Dallas in July ... But I don't believe it.

It is not clear if this distinction comes from commitment to the propositional content or not. We return to this problem of teasing apart the difference between *clearly/obviously* and *evidently/obviously* later, in 4.4. For now, we can assume that the evidential signal of each of these adverbs is indirect and inferential, however as we will see later, additional specifications on the signal are required to capture their divergent semantic behavior.

1.2.3 English Inferential Evidentiality: *Presumably*

As I discuss more in depth in the next chapter, a language can have two inferential evidentials, where one evidential marks inference from results and observable evidence, such as *llini* and *apparently/evidently* do, and another which marks inference from general knowledge, which *llini* and *apparently/evidently* don't. English (unlike Yup'ik) seems to have both

types of inferential evidentials, as the adverb *presumably* marks such inferences from general reasoning. For example, *presumably* can appear in all those cases where *evidently/apparently* can, such as cases where the speaker did not witness the event, or where there is an observable result.

(101) # I know he left . . . Presumably he left.

(102) (The street is wet.)
Presumably it rained.

Presumably is not sensitive to particular senses, as illustrated by the examples in (103 - 104).

(103) (You hear some loud music playing down the street and people shouting.)
Presumably our neighbors are having a party.

(104) (You come home and your house smells of natural gas.)
Presumably I left the oven on.

Cases in which *presumably* differs from *apparently/evidently* are those conjectural contexts, specifically the drunken-wine scenario. Here, *presumably* is felicitous, as it expresses reasoning from general knowledge, such as John's wine habit.

(105) Context: Black clouds loom overhead.
Presumably it is going to storm.

(106) Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party, but find that some bottles are missing. One of your colleagues, John, you know to be quite the wine-lover.
Presumably, John drank all the wine.

The adverb *presumably* can also be used for the lost keys scenario and the restaurant window scenario, two scenarios which created infelicitous contexts for *llini*, *apparently/evidently* and *clearly/obviously*.

(107) Context: You cannot find your car keys. You have looked everywhere in your house that you have been known to find them, and they are nowhere to be found. You've decided the last place they could be is in your car.
Standing in your living room, you claim the following:
Presumably my keys are in my car!

(108) Context: You and a friend are walking by a restaurant window. The server has just placed a bowl of soup in front of someone that looks entirely unappetizing. This person has not tried the soup yet. You have never tried the soup or even eaten at that particular restaurant.

(a) *Visual appearance of the food only*:
Presumably that dish tastes disgusting.

(b) *The consumer of the food makes a twisted face; spits out the food*:
Presumably that dish tastes disgusting.

As we see from the examples above, *presumably* differs from *evidently/apparently* in that it may express reasoning from general knowledge alone, as well as those cases where other, observable evidence exists.

Presumably and Syntactic Constraints

The only epistemic modal that can felicitously co-occur with *presumably* is epistemic *must*, although here this use may seem less clearly felicitous than the previous examples.

(109) Presumably my keys must be in my car.

Presumably is infelicitous with the epistemic modals *might* and *should*.

(110) # Presumably my keys might be in my car.

(111) # Presumably my keys should be in my car.

Presumably can also co-occur with the reportative adverb *supposedly* in the same utterance.

(112) The other ends of language (although these are not, presumably, supposedly to be exhaustive) include...[52]

Presumably can also be used grammatically in questions, in both polar interrogative and content questions alike. Again we find, however, that these constructions seem highly marked.

(113) Polar Question

(a) Did Ben presumably win the race?

(114) Content Question

(a) Where did John presumably go?

Presumably is infelicitous with simple imperatives, but again we see that utterances with deontic modals appear to be acceptable in the case of *should*, although deontic *must* on the other hand, seems less clearly felicitous.

(115) Imperative

(a) # Presumably leave!

(116) Deontic Modal

(a) Presumably you should go to the store.

(b) ? Presumably you must leave!

[52]http://home.wlu.edu/ mahonj/Berkeley.Language.htm

As we see from the examples above, *presumably* seems to encode inference from general knowledge. This closes our discussion of the English inferential evidential paradigm, which appears to have more evidential expressions than Yup'ik, which lacks an inferential evidential of this type, one that marks a proposition that has been inferred from general knowledge or assumption.

1.2.4 English Reportative and Quotative Adverbs: *Supposedly, Reportedly* and *According (to X)*

The reportative adverbs *supposedly, reportedly* exhibit similar evidential behavior to Yup'ik *gguq*.[53] It is not controversial that *supposedly* and *reportedly* mark previously-asserted propositions, either spoken or written.

(117) Supposedly John called. (Melanie told me he did.)

(118) Reportedly, they found $6 million dollars in a mattress. (I read it in the *Post*.)

Supposedly and *reportedly* seem to be limited to only the evidence of previous report. For example, one cannot use *supposedly* if he has inferential evidence, either from general knowledge or observation of results. While this is not surprising for *reportedly*, the fact that *supposedly* is specific to a source of a previous assertion may be somewhat less straightforward.

(119) Observable Result

Context: You have locked your bike up to the bike rack outside the cafe. A few hours pass, and you walk outside the bar to see that your bike is no longer attached to the rack and is in fact, nowhere in sight.

\# Supposedly my bike has been stolen!

[53] *Allegedly* could be included in this discussion, but I have not done so here, due to the fact that its use is somewhat limited. See discussion in Ifantidou (2001) for more about *allegedly*.

(120) General Knowledge

Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party, but find that bottles are missing. One of your colleagues, John, you know is quite the wine-lover.

Supposedly John drank all the wine.

The reportative is sensitive to some extent to the form of the original utterance. For example, if we change the scenario slightly, where you have a report that expresses *Your bike has been stolen*, then the proposition marked with *supposedly* is felicitous.

The felicity of both *supposedly* and *reportedly* is sensitive to the context of the original content. If the report expresses something similar, such as *Your bike is gone*, it is not felicitous to relay that your bike has been stolen with the reportative.

(121) Propositional Form and the Reportative

A to B: Your bike is missing from the rack.

(a) **B to C:** Supposedly/reportedly my bike is gone.

(b) **B to C:** # Supposedly/reportedly my bike has been stolen.

As we see from the above, you cannot relay the inference made from the report, even if the inference is a very clear one. If your friend tells you he saw someone ride off with your bike, then you can ask your friend to call a cab and tell them that someone stole your bike with *supposedly/reportedly*.

Similar to the reportative evidential *gguq*, two reports of a similar proposition can be marked by a single instance of *reportedly* or *supposedly*.

(122) Context: Someone asks you if your brother Bill was at the party last night, which you did not attend. Your friends, John and Mark said the following to you.

John tells you: *Your brother was at the party*

Mark asked you: *What was Bill doing at the party last night?*

You answer:

(a) Supposedly/reportedly Bill was at the party.

Additionally, contradictory propositions cannot be marked with one instance of *reportedly* or *supposedly*.

(123) # Supposedly/reportedly Bill won and Bill didn't win.

There is no way to indicate the origin of a report when marked with *reportedly* or *supposedly*, and in order to mark the original speaker one must add a verb 'say'.

(124) *Bill reportedly John won the race.

(125) Bill said supposedly John won the race.

The English Quotative Adverb: According (to X)

There is a type of reportative evidential that can indicate the source of the utterance explicitly. In this case, the evidence signal, that of a previous assertion, does not differ, only whether the original speaker is indicated or not. Reportative or hearsay evidentials such as *gguq* and *reportedly* and *supposedly* are those reportative adverb types which do not indicate source. Quotative evidentials, on the other hand, are reportative evidentials which do mark an original speaker. The adverb *according (to X)* marks a previous report and explicitly indicates the original speaker of the utterance, without an instance of the verb 'say'. Thus, I consider *according (to X)* a quotative reportative evidential.

Reportative (and quotative) evidentials are different from other evidentials as they can mark propositions which the speaker either feels neutral toward, or does not believe. In this case, some uses of reportative evidentials may convey some type of doubt or lack of belief (Murray 2010; Aikhenvald 2004; Faller 2002). It is not the case that all propositions relayed

with reported evidentials such as *supposedly*, *reportedly* or *according (to X)* are done so in a neutral or disbelieving way.[54]

We see that English reportative adverbs can also vary in terms of the degree of speaker endorsement. For example, in the example below, the original speaker Bill can either be a trustworthy or a non-trustworthy source. The reporting speaker can convey either, by adding a subsequent proposition which is more informative about the source. That the report is reliable or unreliable is a conversational implicature (Grice 1975), as it can be either strengthened, as in (126i') and (127i'), or weakened (126i'') and (127i'').

(126) Supposedly/Reportedly John won the race ...

Well, that's what Bill told me.

(i') And Bill was there to see it.

(i'') But we all know Bill does not always have the best info.

(127) According to Bill, John won the race ...

(i') And Bill was there to see it.

(i'') But we all know Bill does not always have the best info.

The fact that the source of any given report can vary in terms of their reliability or trustworthiness affects the semantics of the reportative.

[54]Murray (p.c.) mentions that the reportative evidential in Cheyenne varies. She offers the scenario where we are walking on a trail, and I point to a tree and say the following *That is a Quaking Aspen, also known as Populus tremuloides* using a reportative evidential. The use of the reportative here is meant to convey that this statement comes from a source who is perhaps more knowledgeable than the speaker, a botany professor perhaps. Murray claims that the fact that the report came from the botany professor is in the common ground. It's not clear if this negates, or at least complicates, to some extent the analysis of the evidential as a not-at-issue assertion versus presupposition. In fact, according to Murray, if the speaker in this case were to make the claim with a direct evidential it would be taken as infelicitous, because I am not a botany expert and cannot have such knowledge.

English Reportative Adverbs and Morphosyntactic Constraints

The use of *supposedly* and *reportedly* seem to be infelicitous when marking propositions with epistemic *must*, however this infelicity does not arise with *according (to X)*. In these cases, it seems as though the speaker is reporting a modal proposition.

(128) ? Supposedly Bill must have won the race.

(129) ? Reportedly Bill must have won the race.

(130) According to John, Bill must have won the race.

Similar to the previous evidentials, propositions with epistemic modals other than *must* also seem to be more infelicitous, yet still not completely infelicitous. In these cases, a potential reading could be that one relaying a previously-said modal utterance.

(131) ? Supposedly Bill might have won the race.

(132) ? Reportedly Bill should won the race.

(133) ? According to John, Bill might have won the race.

Reportative adverbs can mark proposition with other evidential adverbs.

(134) Reportedly Bill apparently won the race.

(135) Supposedly Bill evidently won the race.

(136) According to John, Bill evidently won the race.

Supposedly, *reportedly* and *according (to X)*, unlike *gguq*, are infelicitous when marking plain commands, but felicitous with a deontic modals *should* and *must*.

(137) Plain Commands

(a) #? Supposedly leave!

(b) # Reportedly eat your vegetables.

(c) According to John, leave!

(138) Deontic Modals

(a) Supposedly you should leave.

(b) Reportedly you should eat your vegetables.

(c) According to John, you must leave.

These adverbs can be used grammatically in questions, both polar interrogatives and content questions alike. Some speakers report that they find these uses of the reportative evidential in questions to be highly marked.

(139) Polar Questions

(a) Did John supposedly go to the party?

(b) Did Ben reportedly win the race?

(c) According to John, did Ben win the race?

(140) Content Questions

(a) Where did John supposedly go?

(b) Who reportedly won the race?

(c) According to John, who won the race?

The use of these adverbs in questions seems to indicate, that the speaker presupposes that the addressee only knows the proposition by way of report (Murray 2010).[55]

1.2.5 Chapter Summary

In section 1.1, I provided an introduction to Eskimo-Aleut evidentiality, particularly that of Central Alaskan Yup'ik, and some important aspects of the grammar relevant to evidentials. I then discussed English evidential adverbs in section 1.2, and their similarities with the evidentials of Central Alaskan Yup'ik. Both Yup'ik and English only mark indirect evidentiality. The summary of the findings with respect to evidence source type, semantic and morphosyntactic constraints of each evidential can be found in Table 1.2 on the following page.

[55] According to Murray, in such a case, an answer offered without a reportative evidential in this case would be infelicitous, and we see this in Cheyenne. Murray gives the following example:

(i) Presupposed Source of Evidentials in Questions

(a) *Tsé-h-méo-vóonaˈo* *ná-hkoˈéehe* *é-hoeéístse-∅*
DEP-PST-early-morning 1-mother 3-incoming.call-DIR
'Early this morning my mother called.'

(b) *NéhoˈéehE* *é-vóon-omóhtahe-**sėstse***
1.father 3-all.night-be.sick-RPT.3SG
'[She said] my father was sick all night.'

(c) # *NéhoˈéehE* *é-vóon-omóhtahe-∅*
1.father 3-all.night-be.sick-DIR
'My father was sick all night.'

(Murray (2010: 31(2.24))

	Evidential	Evidence "Type"			Belief Required	With Modals	Yes/No Q	Moods			
		Inference Obs. Res.	Conjecture/ Speculation	Reports				IND	INT	OPT/IMP	PART
Yup'ik	*llini*	yes	no	yes	yes	no	yes	yes	yes	no	yes
	gguq	no	no	yes	no	yes	no	yes	yes	yes	no
English	*apparently/ evidently*	yes	no	yes	yes/no†	yes	yes	yes	–	yes	no‡
	clearly/ obviously	yes	no	no	yes	yes	yes	yes	yes	no	–
	reportedly/ supposedly	no	no	yes	no	yes	yes	yes	yes	no	–
	according (to X)	no	no	yes	no	yes	yes	yes	yes	no	–

† Only for cases where reportative/hearsay evidence interpretation can arise.

‡ Without the inferential *llini*.

Table 1.2: Summary of Basic Findings: Yup'ik and English Evidentials

Topics Not Discussed

In this chapter there were several issues with respect to evidentials, which I raised here but I do not address again. For example, I do not discuss why evidentials are not compatible with commands (imperative/optative mood), or their semantics in questions. An investigation into the compatibility between the evidential and particular moods would require a detailed investigation into the semantics of mood in Yup'ik, in addition to the semantics of the evidential, which is the primary focus of the investigation here. A thorough discussion into the former cannot be included here, and is a subject for future research.

Chapter 2

Indirect Evidentiality: Data and Formal Semantic Approaches

In the previous chapter, I provided an introduction to Yup'ik and English evidentiality, whose evidential systems explicitly mark only indirect evidence types of inference and hearsay. The categorization of inference and hearsay as indirect evidence is non-controversial in the evidential literature, and is illustrated by the evidential taxonomy in Figure 2.1 of evidence/evidential types given by Willet (1988).

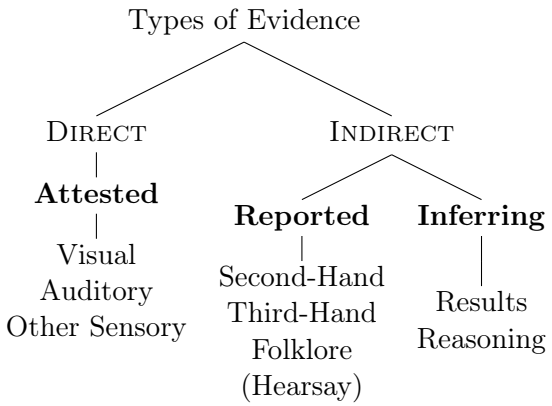

Figure 2.1: Willet's (1988) Evidential Taxonomy

(Willet 1988: 57)

In Figure 2.1, Willet labels both 'inferring' and 'reported' as indirect types of evidence, whereas 'visual', 'auditory', and 'other sensory' are categorized as direct. It is the latter categorization of 'other sensory' and 'auditory', that is sometimes controversial (Willet 1988,

Aikhenvald 2004).[1] The discussion in this chapter focuses on familiarizing the reader with indirect evidentiality and English and Yup'ik evidentials' place in the general indirect evidential paradigm. In this chapter I also discuss formal approaches to evidentials, focusing specifically on how these approaches formally model the evidential content, and whether these approaches capture the evidence expression of evidentials.

2.1 Inferential Evidentiality

There are two types of inference expressed by evidentials, the Inference from Results, or Apparent, and Inference from Reasoning, or Assumed. Yup'ik *llini* and English *apparently/evidently* are inferential evidentials of the APPARENT type, and English *presumably* is an evidential of the ASSUMED type. Yup'ik lacks an evidential of the ASSUMED type. Another evidential, the NON-VISUAL (NV-) SENSORY evidential, has been argued to be both indirect and direct depending on the language analyzed (Barnes 1984, Oswalt 1986, Willet 1988, Faller 2002). I discuss the NV-SENSORY evidential here for completeness.

Non-Visual (NV) Sensory Evidential and Inferential Evidentiality

Aikhenvald (2004) classifies NV-SENSORY evidentials as a type of direct evidential.[2] The NV-SENSORY evidential marks propositions which cannot be [visually] witnessed (e.g., hearing, tasting, smelling or feeling).[3] An example is provided below in (141), where the sense-predicate *smell* is marked with the Nganasan NV-SENSORY evidential *-münü-*.[4]

[1] It is not clear from Willet's categorization whether these are labels of evidential types (the linguistic expression), or evidence types (a non-linguistic concept), but this issue is the focus of the subsequent chapters.

[2] Aikhenvald is not entirely firm on this position, however, as she concedes that NV-SENSORY evidentials, may have an "epistemic extension", encoding some degree of belief or certainty, that should not to be taken to be their primary expression.

[3] Although "witnessing" can be non-visual, such as witnessing taste by tasting, in the evidential literature, and here, witnessing refers to visual witnessing only.

[4] The underlying form is listed as *-mInI-*, where I = vowel harmony [+high, ± back]

(141) NV-SENSORY EVIDENTIAL: *Nganasan*

Ma-tənu	*hihitextipaə*	*kolitextipa͡i*	*ńeluaj-**münü**-t'u*
house-LOC	boiled	fish	feel/smell-NVS-3sg

'There is a smell of boiled fish in the house.'

(Aikhenvald 2004: 47)

The Nganasan NV-SENSORY evidential *-münü-* indicates that the speaker senses there is boiled fish in the house by its odor alone; he does not see the frying. NV-SENSORY evidentials are generally not specific to a non-visual sense type, although an exception to this general rule is the AUDITORY evidential. AUDITORY evidential mark propositions learned by sound (non-hearsay).[5] Evidential systems that have AUDITORY evidentials, however, do not have an additional NV-SENSORY evidential. In these systems, all other non-visual sense evidence is marked with the ASSUMED or APPARENT (Aikhenvald 2004). The only non-visual evidence sense expressed by evidentials independently seems to be auditory, for the other senses, there is no known evidential system which has a distinct evidential for smell, taste or feel (Aikhenvald 2004: 64).[6] Aikhenvald summarizes how NV-SENSORY evidentials differ from the inferential evidentials APPARENT and ASSUMED in the following passage.

> The sensory evidential refers to information acquired by seeing, or to any sensory perception.[7] The inferred evidential typically refers to inference based on visible

[5] *Hearsay* is evidence for a proposition that is in the form of a previous assertion of that proposition.

[6] Locke (*An Essay Concerning Human Understanding*, eBooks@Adelaide 2004 version) makes a distinction between PRIMARY and SECONDARY qualities of objects. Primary qualities are properties of objects that are considered to be independent from the observer. These are things such as the shape, solidity, and an object's movement in space. Secondary qualities are properties that are generally thought to be subjective to the observer: color, taste, smell, and sound, such as "purple" or "spicy", which can be those qualities that are effects of primary characteristics, are not considered inherent to the object, and often involve only one sense. Primary characteristics can be discerned through a variety of senses. For example, I may be able to see and feel "round" but I cannot both see and feel "purple".

[7] The only sensory evidential in Aikhenvald's cross-linguistic typology of evidentials that is sensory and NOT non-visual sensory can be found in A4 systems, which only make the distinction between sensory and reported/hearsay evidence (see Table 3.1, p. 151); therefore this particular issue is not relevant here. Thus "sensory" here refers to NV-SENSORY. We can simply add this to the list of exceptions to evidential source-type labels.

or tangible results, or direct physical evidence. The assumed evidential is to do with assumption, or general knowledge.

(Aikhenvald 2004: 54)

An example of an evidential system that has all three evidential types, NV-SENSORY, APPARENT and ASSUMED is Tuyuca (Barnes 1984). The following example marks the proposition *He played soccer* with each of the evidentials NV-SENSORY, APPARENT and ASSUMED evidentials in Tuyuca.[8]

(142) NV-SENSORY, APPARENT and ASSUMED: *Tuyuca*

(a) NV-SENSORY

*dűga apé-**ti***

'He played soccer.' (I heard the game and him, but didn't see it or him.)

(b) APPARENT

*dűga apé-**yi***

'He played soccer.' (I have seen evidence that he played: his distinctive shoe print on the playing field. But I did not see him play.)

(c) ASSUMED

*dűga apé-**hĩgi***

'He played soccer.' (It is reasonable to assume that he did.)

(Barnes 1984:257f., cf. Faller 2002: 42-43)

Barnes (1984) gives the following description in (143) for the evidence signal of the NV-SENSORY, APPARENT and ASSUMED evidentials.

[8]Barnes does not provide glosses for the examples.

(143) Barnes' (1984) Nonvisual, Apparent and Assumed

(a) Nonvisual evidentials are used to report how someone, something, or some event smelled, sounded, tasted, or felt (smells, sounds, tastes, or feels). These evidentials are used if the person(s), thing(s), or event(s) referred to were not or are not visible due to a wall, dense forest, darkness, etc. (1984: 259-260)

(b) An apparent evidential is used when the speaker draws conclusions from direct evidence. (1984: 260).

(c) An assumed evidential is used when the speaker has prior knowledge about the state of things or about habitually general behavior patterns. (1984: 262)

In (142), in all instances the speaker did not visually witness the subject playing soccer. In the case of (142a), his vision was obscured in some way, but experienced the event through his other senses. The speaker was close enough to hear the game taking place, or at least in the vicinity at the time of the game, but not able to visually see it. This is not the case for the apparent and assumed, the speaker does not seem to be expressing the same type of reasoning. In these cases, the speaker seems to indicate that his presence and the event did not overlap, and in the case of the apparent, that his inference is after the fact.[9] The

[9]Another interesting pattern that seems to emerge with the nv-sensory evidential, when it does not have an auditory interpretation, is the event type of the predicate which it marks. In Aikhenvald's (2004) typology, in *D1* systems (languages with five evidentials), the sensory evidential always has an auditory interpretation. In all cases where a nv-sensory evidential marks a proposition which describes an event, such as *José played soccer*, the evidence source interpretation is that the speaker heard something. Aikhenvald also claims that inferences made from non-visual senses other than auditory are marked with the assumed in Tariana. For example, many propositions which are marked with a nv-sensory evidential (at least provided by Aikhenvald), contain *stative* event predicates, in which no action occurs in languages with fewer than five evidentials. Two examples are given below, one from Ngiyambaa (Australian: Donaldson 1980: 257-258) and one from Tuyuca, in (1).

(i) nv-sensory evidentials and stative predicates

(a) nv-sensory: *Ngiyambaa*

*dhagun-gir-**gara***	*ŋina*	*diŋga*	*ga-ɽa*
earth-nasty.with-sens.ev	this.abs	meat.abs	be.pres

'This meat tastes nasty with earth. (I have tasted it.)'

ASSUMED does not seem to indicate any kind of temporal sequencing or tense, but simply that given what is known, it is plausible that the event took place.

Further investigation of NV-SENSORY evidentials, however, must be left to future research, as neither Yup'ik nor English seem to have a NV-SENSORY evidential. From the few examples given, it does not appear that there is sufficient evidence to include the NV-SENSORY evidential in the same category of indirect or inferential evidentiality. This position on the NV-SENSORY is in keeping with the argument provided by Aikhenvald (2004).

2.1.1 Inferential Evidentials: Apparent and Assumed

A number of evidential systems have both an APPARENT and an ASSUMED evidential. An example of such a system is Tsafiki (Barbacoan: Dickinson 1999: 37-8; 2000: 407-409; 2001, cf. Aikhenvald 2004, where the APPARENT evidential is described as marking those propositions inferred from 'physical' evidence' (144a), and the ASSUMED as indicating those propositions inferred by general reasoning (144b).

(b) NV-SENSORY: *Tuyuca*
*yoáro susúhã-**ta***
'They smelled (of liquor) a long way off.'

(Donaldson 1980: 275-278, cf. Aikhenvald 2004: 34)

Additional evidence exists that may suggest that the connection between eventuality and evidential types is an issue which may warrant further investigation. The correspondence between evidentials and event predicates, has been previously noted in Aksu-Koç & Slobin (1986: 161), who report that when the present perfect *-mIş*, an indirect evidential with a hearsay or inferential interpretation marks a stative predicate, the inferential evidential interpretation fails to arise (only the hearsay interpretation does). There is unfortunately not enough data to fully test the hypothesis of the correlation between event-type and evidential. Some of the data above do provide argument against this hypothesis, but this deviation seems to be predictable as well; only those NV-SENSORY evidentials that are interpreted as AUDITORY mark non-stative predicates. The APPARENT and ASSUMED, on the other hand, are always used for eventitive predicates (that seem to be generally of the *accomplishment* and *achievement* type).

(144) Inferred & Assumed Evidentials: *Tsafiki*[10]

(a) inferred

Manuel *ano* *fi-**nu**-e*

Manuel food eat-INFR-DECL

'Manuel ate.' (the speaker sees the dirty dishes)

(b) assumed

Manuel *ano* *fi-**n-kiu**-e*

Manuel food eat-NOMN-VCLASS:do-DECL

'Manuel ate.' (he always eats at 8 o'clock and it's now 9 o'clock)

(Aikhenvald 2004: 54)

In both cases the speaker expresses the proposition *Manuel ate*. The meaning of the utterance is altered only by a single evidential morpheme from *nu* (apparent) to *n-kiu* (assumed). By marking the proposition with *nu* in (144a) above, the speaker infers that Manuel ate because she sees the observable result of eating, dirty dishes. When the proposition is marked with *n-kiu* in (144b), the speaker infers Manual ate based on his habits, that he generally eats at a certain time, and this time has passed. There does not need to be an observable result of Manuel's eating in order to felicitously use the assumed *n-kiu*, but that does not preclude observable evidence from being present.

Observational Evidence and the Apparent and the Assumed

It is not clear in some cases, what counts as observable evidence that can be felicitously marked with the apparent and what must be marked with an assumed. There are cases in which observational evidence is present, but the speaker expresses such observable evidence with the assumed and not the apparent. Shipibo-Konibo (Panoan, Valenzuela 2003: 35-7,

[10]In (144b), the verb *fi-* takes the nominalizing suffix *-n-* when used with the assumed evidential. Aikhenvald draws attention to this, but does not elucidate why this is important.

cf. Aikhenvald 2004: 55) has the APPARENT evidential *-bira* and the ASSUMED evidential *-mein* (in addition to the DIRECT/SENSORY evidential *-ra*, which was mentioned previously). Descriptions of these evidentials' inferential signals are similar to those normally given for these types: the inferential (APPARENT) evidential *-bira* expresses inference from observable evidence and/or reasoning, and the ASSUMED evidential *-mein* expresses inference from assumption and/or speculation. In the example below, however, Aikhenvald claims that the difference between the APPARENT inferential *-bira* and ASSUMED *-mein* marks the different types of reasoning that a speaker uses to express the proposition *He sprained his ankle*. Aikhenvald only provides an example with the APPARENT evidential *-bira* and does not provide the example with the same proposition marked with the ASSUMED evidential *-mein*.

(145) APPARENT EVIDENTIAL: *Shipibio-Konibo*

oa-rá	*taské-**bira**-ke*
DIST:ABS-DIR.EV	sprain-INFR-COMPL

'He must have sprained his ankle.'

(Aikhenvald 2004: 55, cf. Valenzuela 2003: 35-7)

According to Aikhenvald (cf. Valenzuela 2003: 35-7), in the case above where the person witnesses a soccer player fall during a game and people crowd around him, he could mark the proposition with the APPARENT evidential *-bira*.[11] The ASSUMED evidential *-mein*, however, would be used to relay the proposition *He sprained his ankle*, in the case where one sees a random, anonymous person limping. In both cases, the speaker makes an inference based upon an observation of a result of an accident. In the explanation provided by Aikhenvald, it is not clear how seeing a person limping does not count as an observable result of having a sprained ankle, and why in this case the observation only counts fits an evidential which marks assumption, and not one that marks reasoning from observation. It seems that there

[11]It is perhaps worth noting that both the DIRECT evidential *rá* and INFERENTIAL *bira* are included. It is not discussed by Aikhenvald what effect of the presence of the DIRECT evidential has, if any.

is no other description given for the APPARENT and ASSUMED that does not draw upon observable/non-observable distinction, as descriptions offered by Willet (1988) and Barnes (1984) follow similarly.

(146) WILLET'S (1988) APPARENT AND ASSUMED

(a) Inference from Results (APPARENT):
The speaker infers the situation described from *observable evidence* (i.e., from perception of the results of the causing event or action)

(b) Inference from Reasoning (ASSUMED):
The speaker infers the situation described on the basis of intuition, logic, a dream, previous experience, or some other *mental construct*

(Willet 1988: 96)

(147) BARNES' (1984) APPARENT AND ASSUMED

(a) An APPARENT evidential is used when the speaker draws conclusions from direct evidence.[12] (1984: 260).

(b) An ASSUMED evidential is used when the speaker has prior knowledge about the state of things or about habitually general behavior patterns. (1984: 262)

There seems to be no other way in which these two inferential evidentials are distinguished, which creates a problem for explaining scenarios where observations are present, and this is problematic not only for the data given here, but even for Barnes' own Tuyuca data for both the ASSUMED and APPARENT (also raised by Faller 2002). Take the following examples in (148).

[12]Barnes' "direct evidence" above is not direct evidence in same way as sensory evidentials, or visual witnessing evidence, but an observable result.

(148) Apparent Evidential: *Tuyuca*[13]

(a) *pisáñã mĩnĩmãkɨ́re nɛ́ɛ̃yahã-**yi***

'(Apparently) the cat caught and ate a bird.'

(Said while looking at feathers on the ground.)

(b) *bóahõã-**yu***

'(Apparently) it rotted.'

(Said of a plant after pulling it up to examine it.)

(c) *kõáhã-**yu***

'(Apparently) I threw it away.'

(Said with reference to a missing earring.)

(Barnes 1984: 260)

In (148a – 148b) there is undeniably some kind of observable evidence. In (148c), however, the observable evidence of throwing away, the lack of an earring, is less convincing as observable evidence of the earring having been specifically thrown away, rather than say, lost or stolen.[14] In other words, the evidential connection between a missing earring and having thrown it away, seems to be less obvious of an explanation than the explanation of the observation of a dead plant and inferring of its having rotted.

Examples of the Tuyuca assumed evidential are given in (149).

(149) Assumed Evidential: *Tuyuca*

(a) *Bogotápɨ nɨ́ĩ-**ko***

'She is in Bogota.'

(She left last week and said that was where she would be.)

[13]Barnes (1984) does not provide morphological glosses for her examples, only transcriptions and translations.

[14]Perhaps it is possible this utterance was given in a context where the speaker had been throwing things away, which would make the conclusion that she threw the earring away, rather than lost it, a likely explanation. This use is odd compared to English and Yup'ik apparent evidentials.

(b) *wĩmā́ra hóa-**hĩya***

'The children drew those pictures.'

(It is apparent that someone drew them, but it is assumed that the children did it.)

(c) *diágo tii-**kú***

'You are sick'.

(The way you are groaning, you must be sick.)

(Barnes 1984: 262)

The examples above present a problem for Barnes' definition of the ASSUMED.[15] The explanation of (149a) is problematic for Barnes' description of the evidence signal because the speaker uses the ASSUMED evidential to mark a proposition learned by hearsay, and not by reasoning based on the subject's habits or the speaker's general knowledge. Although hearsay evidence is not observable, it is not the case that the speaker has inferred the proposition *She is in Bogota* from either general knowledge or the habits of the subject, such as if the speaker knew the subject habitually traveled to Bogota. (Compare this is to Manuel example in (144b).)

We encounter a similar problem, when investigating what counts as observable evidence (and what doesn't), with the data in (149b) and (149c). In both examples there is observable evidence. In (149b), perhaps these are crudely-drawn or stick-figure families. In (149c), the speaker is very obviously observing that the person before them is moaning and groaning. Thus it seems that distinguishing the APPARENT and ASSUMED in terms whether observable evidence is present or not, is not the most fitting explanation or description of the data we see.

[15] Also raised in Faller (2002).

2.1.2 The Apparent and Assumed in Yup'ik and English

Recall from the discussion in the previous chapter, that *llini* is an indirect inferential evidential: if the speaker has directly witnessed an event, an utterance with evidential *llini* is infelicitous, as shown in (150a).[16] *llini* is used to mark those propositions which a speaker has learned by inference (150b), conjecture in certain constrained contexts (150c), but not basic conjecture (150d). *llini* also cannot mark propositions learned by deductive or eliminative reasoning (150e). For more examples and discussion, I refer the reader to the discussion in the previous chapter, section 1.1.3.

(150) Yup'ik Inferential Evidential *llini*

(a) Indirect Evidence Only

# *Aya-llru-**llini**-uq...*	*Tange-llru-aqa*	*ayag-cess-luku*
leave-PAST-INF-IND.3SG...	see-PAST-IND.1SG$_s$-3SG$_o$	leave-PAST-SUB.3SG

(Intended: 'Evidently she left... I saw her leave.')

(b) Inference from Results

Atrayaaq-uk	*imkut*	*ilak-ek*	*tayim'.*
get.down-IND.3PL	their	kin-REL.3PL	gone.

'When they got down their family was gone.'

Uni-llu-kek-am	*aya-**llini**-lri-it*
leave.behind-PAST-PART.3SG$_s$-3DUAL$_o$-REL.3DUAL	leave-INF-PART.3PL

'Evidently they had gone ahead without them.'

(Fienup-Riordan & Kaplan, 2007: 14)

[16] In its pure evidential sense. When used in mirative contexts, as we see in section 4.2.1, the inferential is not infelicitous when used while witnessing an event.

(c) Inference from Observation/Knowledge

*Ellallir-ciq-**llini**-uq* (*iral-ut* *tungu-ameng*)

rain-FUT-INF-IND.3SG (cloud-ABS.3PL black-REL.3PL)

'Evidently it will rain (because the clouds are dark).'

(d) Inference from General Knowledge/Conjecture

Context: You are the one designated to keep the box of wine bottles in your office for the department welcome party. You go to take the box to the party, but find that some wine bottles are missing. You have no indication of a possible culprit, except that you know that one of your colleagues, John, is quite the wine-lover.

\# *John-aq* *taangar-yungkeg-ami*,

John-ABS.3SG alcohol-lover-ABL.3SG

taangaq *nange-llru-**llini**-a*.

liquor-ABS.3SG drink-PAST-INF-IND.3SG$_s$-3SG$_o$

(Intended: 'Knowing that John is a louse, evidently he drank all the wine.')

(e) Deductive/Eliminative Reasoning

Context: Suppose you have lost your car keys. You have looked everywhere in your house, high and low, and they are nowhere to be found. Given you cannot find them anywhere you've looked, you've decided the last place they could possibly be is in your car.

\# *Kelucanka nunakuarcuute-mi uita-**llini**-ut*

keys car-REL.3SG be-INF-ABS.3PL

'Evidently the keys are in my car.'

The infelicity of (150e) in a deductive/eliminative reasoning scenario are not a quirk of *llini*. Some inferential evidentials are even more restrictive, such as that Stát'imcets sensory (inferential) evidential *lakw7a* (Matthewson 2011). Matthewson provides the following example to illustrate a "pure reasoning" scenario, a shell game in which *lákw7a* is infelicitous.

In this case, according to Matthewson, speakers volunteer the ASSUMED inferential evidential *k'a* as the felicitous alternative inferential evidential for the scenario in which there is what most would consider observable evidence, but not the kind that can license the use of the APPARENT evidential.

(151) SHELL GAME: St'át'imcets *lákw7a*

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

# *láti7*	***lákw7a***	*lh=as*	*legw*
there	SENSE	COMP=3SBJN	hide

'It must be under that one.' (Volunteered with inferential *k'a*.)'

(Matthewson (2011: 19)

As we see from the examples above, the APPARENT *lákw7a* cannot be used in the shell game scenario, although there is some type of observable evidence, and there should be only one place where the coin could possibly be, as two of the three have proven empty. For shell game scenarios, Yup'ik *llini* can be considered felicitous by some, as some consultants rate this example as "OK", but not "good", or something that they would say.

(152) Shell Game: Yup'ik *llini*

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

*Tuante-**llini**-uq*

under.there-INF-IND.3SG

'It is under that one.'

In the previous chapter, I provided data to illustrate that English *evidently* and *apparently* carry an inferential evidentiality similar to the Yup'ik *llini*. The use of *evidently/apparently* is infelicitous if one has direct evidence that the proposition is true.[17] *Evidently* and *apparently* behave similarly in the evidence scenarios given for Yup'ik above.

(153) English Inferential Evidentials: *Apparently* and *Evidently*

(a) Indirect Evidence

I know he left... # Evidently/apparently he left.

(b) Observable Results

(You walk outside and see that the street is wet.)

Evidently/apparently it rained.

(c) Observation/Conjecture

(Black clouds have suddenly moved overhead.)

Evidently/apparently it is going to storm.

(d) General Knowledge

Context: You are the one designated to keep the box of wine bottles in your office

[17]This is in the purely evidential sense. In the mirative reading, the evidence relation must be direct; I discuss this in 4.2.1.

for the department welcome party. You go to take the box to the party, but find that some wine bottles are missing. You have no indication of a possible culprit, except that you know that one of your colleagues, John, is quite the wine-lover.

Evidently/apparently John drank all the wine.

(e) Deductive/Eliminative Reasoning

Context: Suppose you have lost your car keys. You have looked everywhere in your house, high and low, and they are nowhere to be found. Given you cannot find them anywhere you've looked, you've decided the last place they could possibly be is in your car.

Standing in your living room, you say:

#Apparently/evidently my keys are in my car!

In the shell game scenario, however, *apparently/evidently* seems to be felicitous, although it is not something that speakers report that they would say spontaneously in this case.

(154) Shell Game: English *Evidently/Apparently*

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

Evidently/Apparently it is under that one.

A difference between *llini* and *apparently/evidently*, is that unlike Yup'ik *llini*, *apparently/evidently* can mark a proposition which can be uttered but then subsequently denied. In these instances of felicitous denial, *apparently/evidently* takes on a reportative evidence interpretation. The perfect of evidentiality (such as that discussed in Izvorski 1997) shares this same property, where the default evidence source interpretation is inferential. An

example from Turkish is given below, *-mIş* indicates that the speaker has indirect evidence for a proposition, and *-dI* indicates the speaker has direct, witnessing evidence.[18]

(155) *Turkish*

(a) PERFECT (INDIRECT)

*Amet gel-**miş***

Amet came-MIŞ

'Amet came/must have come.'

(b) DIRECT

*Amet gel-**di***

Amet came-DI

'Amet came [I saw him].'

(Aksu-Koç & Slobin, 1986: 159)

According to Aksu-Koç & Slobin (1988), Aksu-Koç (2000) and Izvorski (1997), when the proposition marked with Turkish *-mIş* (or the evidential perfect) is denied, the evidential takes on a reportative meaning only, and the inferential interpretation is not available.[19] It is not clear if there are other APPARENT-type evidentials that also have this interpretation (comprising a subtype of the APPARENT), or if English and the perfects of evidentiality are simply idiosyncratic in this regard.[20]

[18]The capital *I* in *-dI* and *-mIş* encode that the vowel is default [+high], and will show vowel harmony for [± back].

[19]Examples of this phenomenon do not seem to be provided, only mentioned.

[20]When the reportative interpretation is blocked, however, a denial of a proposition marked with *apparently/evidently* is impermissible when the evidence relation must be interpreted as an inference from observable results. For example, there are some cases where the inference interpretation of *evidently/apparently* is unavailable, and *evidently/apparently* can only have a reportative interpretation (in order to go through the discourse felicitously). One example is the 'good restaurant' case, given below.

(i) Say you and a friend are walking by a brand new restaurant that has just opened.
You say:
Apparently/evidently the food is good here.

As we see from the discussion above, *evidently/apparently* behave similarly to inferential evidentials of the APPARENT type. In the previous chapter I also discussed the evidential signal of *clearly* and *obviously*, which appeared to pattern somewhat similarly with *evidently/apparently*. In the case of *clearly/obviously*, the proposition marked must be one that is topical in the discussion in order for *clearly/obviously* to be felicitous. The same evidence scenarios given for *llini* and *evidently/apparently* are repeated here with *clearly/obviously* in (156). Additional restrictions on the context are provided in order to illustrate the requirement of the topical nature of the proposition in the context required for felicitous use of *clearly/obviously*.

(156) (a) INDIRECT EVIDENCE

I know it's raining... # Clearly/obviously, it's raining.[21]

(b) OBSERVABLE RESULTATIVE

Context: You [and a friend] walk outside and you see that the streets are wet.

i. Out of the blue:

? Clearly/obviously it rained.

ii. Debating whether or not it rained.

Clearly/obviously, it rained.

(c) OBSERVATION/CONJECTURE

Context: Dark, black clouds loom overhead.

(a) You read a great review.

(b) ? You see the restaurant is completely full, and there's a long line.

(c) # You have been to the chef's other restaurants and thought they were good.

(d) # You have tried the food.

[21]Interestingly, in the case when someone claims direct evidence for p (putting it into the common ground), *clearly/obviously* is OK.

(i) I see that it's raining... # Clearly/obviously, it's raining.

i. Out of the blue:

   # Clearly/obviously it is going to storm.

ii. Debating whether or not it will rain:

   Clearly/obviously it is going to storm.

(d) General Knowledge

Context: You have been designated to keep the box of wine bottles in your office for the department welcome party. As far as you know, the wine bottles are all still in the box. On the day of the party, you go to pick up the box to take it over to the party, but find that bottles are missing. One of your colleagues, John, you know is quite the wine-lover.

Clearly/obviously, John drank the wine.

(e) Deductive/Eliminative Reasoning

Context: Suppose you have lost your car keys. You have looked everywhere in your house, high and low, and they are nowhere to be found. Given you cannot find them anywhere you've looked, you've decided the last place they could possibly be is in your car.

Standing in your living room, you say:

#Clearly/obviously my keys are in my car!

In the case of the shell game, however, *clearly/obviously* seems to be permissible. Perhaps what makes this case felicitous is that the proposition is topical, as the speaker is asked to guess under which shell the coin is.

(157) Shell Game: English *Evidently/Apparently*

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

Clearly/Obviously it is under that one.

It seems that *clearly/obviously* fits the pattern of the APPARENT evidential when the additional requirement of the topical nature of the proposition is satisfied. Discussion of the finer points of the differences between *apparently/evidently* and *clearly/obviously* are not relevant here. I return to this issue later in section 4.4.

Also discussed in the previous chapter was the English ASSUMED evidential, the adverb *presumably*. Similar to *apparently/evidently* and *clearly/obviously*, *presumably* also marks propositions that the speaker does not know for certain, as *presumably* is infelicitous in the case where one has direct evidence. *Presumably* differs from *apparently/evidently* and *clearly/obviously*, however, in that it is felicitous in those scenarios where the speaker has only evidence from general knowledge.

(158) (a) INDIRECT EVIDENCE

It's raining... # Presumably, it's raining.

(b) OBSERVATION/CONJECTURE

(Black clouds have suddenly moved overhead.)

Presumably it is going to storm.

(c) SIMPLE CONJECTURE/GENERAL KNOWLEDGE

Context: You are the one designated to keep the box of wine bottles in your office for the department welcome party. You go to take the box to the party, but find that some wine bottles are missing. You have no indication of a possible culprit, except that you know that one of your colleagues, John, is quite the wine-lover.

Presumably, John drank the wine.

(d) DEDUCTIVE/ELIMINATIVE REASONING

Context: Suppose you have lost your car keys. You have looked everywhere in your house, high and low, and they are nowhere to be found. Given you cannot find them anywhere you've looked, you've decided the last place they could possibly be is in your car.

Standing in your living room, you say:

Presumably my keys are in my car.

Presumably is perfectly felicitous in the shell game scenario.

(159) SHELL GAME: English *Presumably*

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

Presumably it is under that one.

Summarizing the information from above examples, Yup'ik *llini* and English adverbs *clearly, obviously, evidently* and *apparently* are all examples of an evidential signal of the APPARENT, and *presumably* has an evidence signal of the ASSUMED type. As we see from the data, descriptions of 'inference observation from results' and 'inference from general knowledge' seem to be inadequate in describing the ways in which the inferential evidentials differ. If this were the case, then we would falsely predict that the APPARENT evidential would be felicitous in the lost-keys scenario and shell game scenario, as in these cases there is evidence that is observable, and yet we see that the evidential is infelicitous. The descriptions given for the APPARENT and ASSUMED do not entirely capture the types of inferences expressed by evidentials.

2.2 Reportative Evidentiality

The descriptions given for the evidence signals of reportative evidentials are less controversial. By uttering a proposition marked with a reportative evidential, the speaker indicates that they have either heard or read that proposition asserted by someone else, where that person is neither the speaker nor addressee of the current discourse context (Faller 2002; Murray 2010; Aikhenvald 2004).[22] This is the case for either the REPORTATIVE or QUOTATIVE evidential, as they do not differ in their evidence signal, only that in the case of the QUOTATIVE, the original speaker of the utterance can be marked.

(160) Aikhenvald's Reportative Evidential Distinctions

Reportative/Hearsay	For reported information with no reference to those it was reported by
Quotative	For reported information with overt reference to the quoted source

According to Aikhenvald, if a language has a QUOTATIVE evidential, it will also have a REPORTATIVE. There does not seem to be a language that has a QUOTATIVE evidential and not also a REPORTATIVE evidential. If a language where there is only one reportative evidential, it is usually of the REPORTATIVE type (non-speaker marking).[23] An example of a language that has both a REPORTATIVE and a QUOTATIVE evidential is Cora (Uto-Aztecan: Casad 1984; Willet 1988: 68-9). The reportative evidential *nūʹu* in Cora (161) indicates a secondhand report, and can often be found in narratives or folklore (Casad 1984: 197, cf.

[22] As we will see, this "quoting back" use of the reportative evidential may be permissible with English reportative adverbs.

[23] In Aikhenvald's evidential typology (2004: 65), there are only two evidential system types that have both a REPORTATIVE and QUOTATIVE evidential: one type of 4-evidential system (C3), and one subtype of a 3-evidential system (B5). Interestingly, these evidential system types do not distinguish different types of inference (i.e., between INFERENCE FROM RESULTS versus INFERENCE FROM REASONING).

Aikhenvald 2004: 57). The QUOTATIVE evidential *yée* marks 'secondhand direct discourse' (Casad 1984).[24]

(161) REPORTATIVE EVIDENTIAL: *Cora*

ayáa	*pá*	***nūˈu***	*tyú-huˈ-u-rɨ h*
thus	SUBJ	QUOT	DISTR-NARR-COMPL-do

'This is, they say, what took place.'

(162) QUOTATIVE EVIDENTIAL: *Cora*

y-é	*peh*	***yée***	*wa-híhwa*	*m^{w}áa*
here-TOP	you:SUBR	QUOT	COMPL-yell	you:sg
yáa	*pú*	*nūˈu*	*hí*	*t^{y}í-r-aa-ta-hée*
PROCOMP	SUBJ	REP	SEQ	DISTR-DISTR:SG-COMPL-PERF-tell

' "From right up on top here, you will call out loud and clear,"
that is what she called on him to do.'

(Casad 1984: 179; 1992:152, cf. Aikhenvald 2004: 57)

The REPORTATIVE evidential *nūˈu* (161) does not indicate the original speaker source. In (162), the QUOTATIVE *yée* does allow for overt specification an original source.[25]

Reportative evidentials are also distinguished by whether the propositional content marked with a reportative can be subsequently, felicitously denied. Murray (2010) characterizes reportative evidentials as to whether they are EPISTEMIC or ILLOCUTIONARY, where illocutionary reportative evidentials allow the speaker to felicitously subsequently deny the proposition marked. This act with an epistemic reportative evidential is infelicitous, and because of this, epistemic reportative evidentials are taken to commit the speaker to the

[24]The example above appears exactly how it is given in Aikhenvald, where the REPORTATIVE evidential *nūˈu* in (161), as "QUOT", although the QUOTATIVE evidential morpheme in Cora is *yée*. Glossing is updated accordingly in (162).

[25]I discuss what is meant by "marking" the original speaker of the proposition in more detail in section 2.2.1.

propositional content relayed with the evidential.[26] An example of an epistemic reportative evidential is St'át'imcets *ku7* (Matthewson et al. 2007).[27] The example provided in (163) illustrates the speaker's commitment to the propositional content marked with the reportative.[28]

(163) Epistemic Reportative Evidential (Reportative Modal): *St'át'imcets*

#um'-en-tsal-itás	***ku7***	*i*	*án'was-a*	*xetpqíqen'kst*	*táola,*
give-DIR-1SG.OBJ-3PL.ERG	REPORT	DET.PL	two-EXIS	hundred	dollar

t'u7	*aoz*	*kw*	*s-7um'-en-tsál-itás*	*ku*	*stam'*
but	NEG	DET	NOM-give-DIR-1S.OBJ-3PL.ERG	DET	what

'[reportedly] They gave me $200, but they didn't give me anything.'

(Matthewson, et al., 2007: 204)

Schenner (2008) argues that the German modal *wollen*$_{REP}$ can have a reportative interpretation, and may allow an original speaker to be marked like a quotative, although he does not argue this is a REPORTATIVE/QUOTATIVE evidential distinction explicitly. Schenner (2008: 552), provides the following example for *sollen*$_{REP}$ (164a), a modal which has a reportative evidential interpretation, and *wollen*$_{REP}$ (164b).

[26]Epistemic reportatives are also referred to as EPISTEMIC REPORTATIVE MODALS. It is not clear if there are epistemic reportatives that are not considered epistemic reportative modals.

[27]Another term for an epistemic reportative evidential is *epistemic reportative modal* (Matthewson et al 2007; Schenner 2008, 2010).

[28]*Sollen*$_{REP}$ is argued to be a reportative modal in German (Fabricius-Hansen & Sæbø 2004; Schenner 2008,2010). Unlike the St'át'imcets examples offered in (163), *sollen*$_{REP}$ can mark a proposition that the speaker can subsequently, felicitously deny. Schenner (2008) cites Mortelmans (2000:136), a corpus study which found that although *sollen*$_{REP}$ can be used in this manner, this usage is infrequent: 5 out of 137 tokens. This type of "skeptical" usage of the reportative evidential, as with all reportative evidentials, must be marked overtly. It is this requirement that is often overlooked for formal proposals for reportative evidentials.

(164) Reportative and Quotative Modal: *German*

(a) *Adam* ***soll*** *den Mt. Everest bestiegen haben*
Adam SOLL the Mt. Everest climbed have
'It is said that Adam climbed Mt. Everest.'

(b) *Adam* ***will*** *den Mt. Everest bestiegen haben*
Adam WOLL the Mt. Everest climbed have
'Adam claims that he climbed Mt. Everest.'

(Schenner 2008: 552)

It is not clear if $wollen_{REP}$ requires the speaker to believe the propositional content, and thus cannot subsequently denied. If this were the case, then this would be an example of a quotative epistemic reportative evidential, but without further data to illustrate this, we cannot make this conclusion.

Illocutionary reportative evidentials are argued to not commit the speaker to the propositional content. This type of reportative seems to be more common type of reportative. Several examples of illocutionary reportative evidentials are provided in (165) below.

(165) Illocutionary Reportative Evidentials

(a) *Yup'ik*
*Aya-llru-uq-**gguq** ...* *Aya-ksaite-llru-yuka-a*
leave-PAST-IND.3s-HRD leave-PAST-think.that-IND.3SG
'It is said she left... I don't think that she left.'

(b) *Cheyenne*
*É-hoo'koho-**nėse*** *naa oha* *ná-sáa-oné'seómaátsésto-∅*
3-rain-RPT.B.SG and CNTR 1-neg-believe$_B$-MOD$_B$-DIR
'It's raining, they say, but I don't believe it.'

(Murray 2010: 58)

(c) *Amdo Tibetan*

Lhamo	*wa* (*song*)	*gzig*/t^h*œ*	***ser***...
Lhamo	leave-PAST	IND/DIR	HRD...
onkyang	*khomo*	*ma-song* (t^h*œ*)	
but	NEG	leave-PAST.3S (DIR)	

'It is said that Lhamo left... but she didn't leave.'

(Krawczyk 2009: 13)

(d) *Korean*

Jin-i	*cip-ey*	*eps-**tay*** ...	*kuletkey*	*sayngkak*	*anh-hay*
Jin-NOM	home-LOC	not.exist-HRD	do.so	think	NEG-do

'[I heard] Jin is not at home... but I don't think she is.'

(Krawczyk 2009: 24)

(e) *Cuzco Quechua*

*Para-sha-n-**si***,	*ichaqa*	*mana*	*crei-ni-chu*
rain-PROG-3=REP	but	not	believe-1-NEG

p = 'It is raining, but I don't believe it.'

EV = speaker is/was told that it is raining

(Faller 2002: 194)

(f) *English*

Supposedly/Reportedly she left... but I don't think that she did.

In terms of QUOTATIVE evidentials and subsequent felicitous deniability, the QUOTATIVE seems to be an illocutionary reportative evidential. English *according (to X)* in example (166), which I argued to be a QUOTATIVE evidential in the previous chapter, allows for the propositional content to be subsequently, felicitously denied when marked with a QUOTATIVE.[29]

[29]There are no examples given in Aikhenvald (2004) with QUOTATIVE evidentials and denial of propositional content.

(166) According to Bill, John won the race... But I don't believe it.[30]

The fact that propositions marked with reportative evidentials can be subsequently denied is one of the more focal topics of the evidential literature. Much discussion concerns the use of the reportative and the implication of speaker doubt in the truth of the proposition.

> ...In other systems the reported evidential makes an implicit reference to the speaker's attitude to the information obtained from someone else. The speaker may chose to employ the reported evidential for two reasons. Firstly, to show his or her objectivity; that the speaker was the eyewitness to an event and knows about it from someone else. Secondly, as a means of 'shifting' the responsibility for the information and relating the facts considered unreliable.
>
> (Aikhenvald 2004: 180)

Reportative evidentials do not always implicate the lack of speaker belief in the proposition. For example, the reportative *-ronki* in Shipibo-Konibo lacks such implications of unreliability, but simply indicates that the speaker learned of the proposition by way of [verbal] report (Valenzuela 2003: 37-43). The reportative in Nganasan, particularly when used by shamans, carries the implication that the reported proposition is from a highly reliable source (Gusev, forthcoming). Murray reports that in Cheyenne, one must use the REPORTATIVE evidential in the case where the speaker is not an expert on the subject, as the use of the DIRECT evidential would be considered less felicitous (Murray, p.c.).

To summarize the data provided here, reportative evidentiality divides along two lines, neither of which concern the evidence signal of reportatives. Reportative evidentials can be categorized in terms of illocutionary or epistemic, whether speaker can felicitously utter a proposition marked with a reportative evidential and then subsequently deny belief in the

[30]We can also have '...But I don't believe him' in this case, which we can't have with the reportative: *#Supposedly John won the race... But I don't believe him.*

propositional content or not. Reportative evidentials are also categorized as either QUOTATIVE or REPORTATIVE in terms of whether they allow for an explicit speaker argument or not. Although additional data from German or another language with a reportative quotative may suggest otherwise, but given what we find at this time, it seems that QUOTATIVE evidentials are a variety of illocutionary reportative evidentials. The taxonomy of attested reportative evidentials is given in Figure 2.2 below.

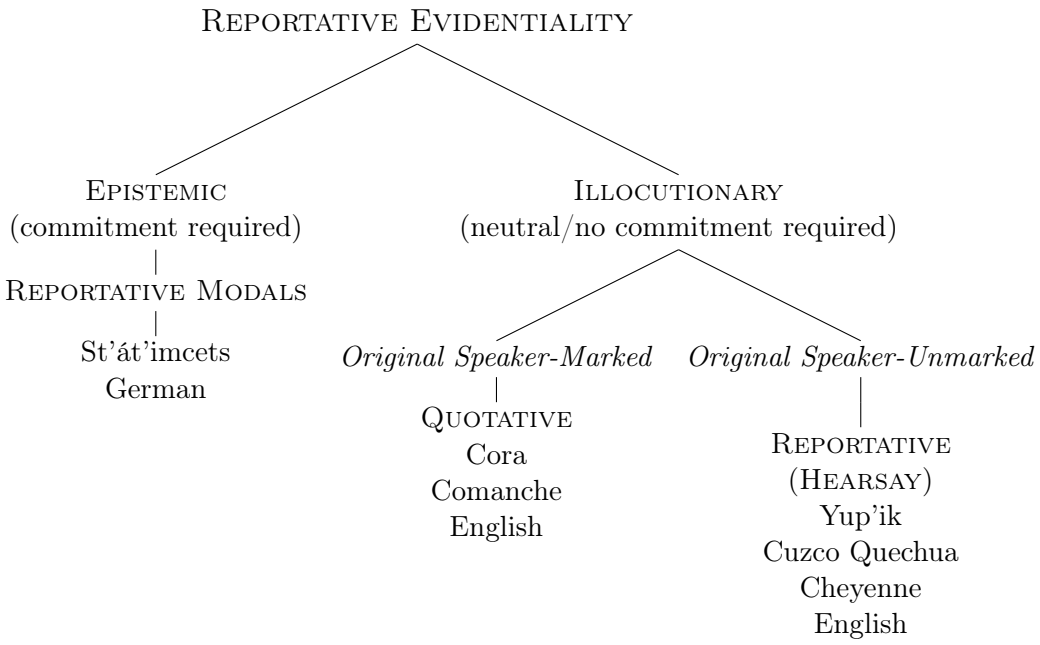

Figure 2.2: Taxonomy of Reportative Evidentiality

The discussion of remainder of the chapter, and the analysis provided herein, centers on illocutionary evidentials, as Yup'ik and English have illocutionary reportative evidentials. In the next two subsections I discuss the QUOTATIVE and REPORTATIVE evidential types in more detail.

2.2.1 The Quotative Evidential

As we saw earlier, Cora (Uto-Aztecan: Casad 1984; Willet 1988: 68-9) is an example of a language that has both a REPORTATIVE and a QUOTATIVE evidential. Comanche (Uto-Aztecan: Charney 1993: 188-91) is another language that also has a QUOTATIVE and a REPORTATIVE evidential. In Comanche, the REPORTATIVE evidential[31] particle *kɨ* indicates a "narrative that lies outside the speaker's personal knowledge– both folktales and events that the speaker learned of from others." (Aikhenvald 2004: 50). The QUOTATIVE *me* is employed "when there is direct quotation." (Aikhenvald 2004: 50) If the quoted utterance occurs in a narrative (remote past) context, then the reported material is doubly-marked with the QUOTATIVE and the REPORTED/HEARSAY with the form *me-kɨ*.

(167) Reportative Evidentiality: *Comanche*

(a) Quotative

hãã	***me****-se*	*sutɨ*$^{=}$	*patsi*
yes	QUOT-CNTR	that.one	older.sister

'The older sister said, "yes".'

(b) Reportative (+ Quotative)

sutɨ$^{=}$*-se*	'yes'	***me-kɨ***
that.one-CNTR	yes	QUOT-NARRATIVE.PAST

'He (Coyote) said, "yes", it is said.'

(Aikhenvald 2004: 50)

With the QUOTATIVE, the speaker makes reference to the original speaker of the proposition. In (167a) the sister said "yes", whereas in (167b) is a report of a report where Coyote said "yes". It is not entirely clear from the glosses and translations provided in (167), whether the proposition marked with the QUOTATIVE is quotation.[32]

[31] Charney calls *kɨ* the "narrative".

[32] An interesting question with respect to these evidentials' "direct quotation-ness" would be to see the meaning that the proposition takes on when in the following from Potts (2007: 15, via Christine Gunlogson, p.c.).

Original Speaker "Marking"

The term "mark" given for the description of the QUOTATIVE however, is rather non-committal in its terminology. We can make an effort to be more explicit here in terms of what is meant by "marking". In the case of the REPORTATIVE evidential, the explanation for what prohibits the original speaker from being marked is syntactic; there seems not to be an available argument position for the original speaker associated with the REPORTATIVE.

We do see that some REPORTATIVE evidentials can "become" QUOTATIVE evidentials. This is not an instance of a true QUOTATIVE evidential. According to Aikhenvald, the REPORTATIVE evidential in Jarawara "can be used as a QUOTATIVE; that is, the author of reported speech may be overtly stated." (Aikhenvald 2004: 84) One should be wary of this description, however, as in order for the reportative evidential in Jarawara to be used as a QUOTATIVE, "a reported suffix is followed by a clause with the verb 'say'." (Aikhenvald 2004: 84) Thus it is not clear whether the verb 'say' is supplying the argument position, or the QUOTATIVE morpheme is.

(168) Original Speaker Marking: *Jarawara*

(a) Reportative

$Kamo_A$	awi_o	*naboe-**himonaha***	*Faha.biri*	*jaa*
Kamo(m)	tapir(m)	kill-REP.m	Fahabiri	AT

'Kamo is reported to have killed a tapir at Fahabiri.'

(i) Q: When the officer asked him how much he had to drink, what did he say?

(a) Nothing.

(b) "Nothing."

To say *nothing* and to say "nothing" have two completely different meanings. In (1a), the officer is reporting the suspect's silence, that he did not say anything in response to the officer's question. In (1b), on the other hand, the officer is reporting that the suspect answered his question, tell him that he had "nothing" [to drink]. Thus, if quotative evidentials are quotational, then we would expect that when relayed with 'nothing' they should carry the meaning of (1b) and not (1a). (Unfortunately there are no examples I am aware of which disambiguate this issue.) As we see in the next section, the Reportative, at least in Yup'ik (and English and Cheyenne), is almost always interpreted as (1a) above.

(b) REPORTATIVE + 'SAY' ("QUOTATIVE")

Izaki$_A$	*Nanatoboto*$_o$	*mera*	*kejehe-<u>mona</u>*,
Izaki(m)	Nanatoboto(m)	3nsgO	trick-REP.m
<u>Tioko</u>$_S$	*hi-na-hare-**ka***		
Tioko(m)	Oc-AUX(say)IMM.P.1STH.m-DECL.m		

'Izaki is reported to have tricked Nanatoboto's people, Tioko said.'

(Aikhenvald 2004: 84)

As we see in the example above, it is not that the reportative takes on a quotative meaning, but rather that the reportative can co-occur with the verb 'say'. The argument position for the original speaker seems to be provided by the verb 'say', and this prohibits the conclusion that the QUOTATIVE evidential alone may allow for the speaker argument.

This type of construction of REPORTATIVE+'say' can also occur in Yup'ik. (169a) is an example of the construction with the REPORATIVE evidential *gguq*, without an indication of an original speaker. (169b) illustrates an attempt to simply "add" (topicalize), an original speaker argument, *John*; and the example is completely ungrammatical. Attempts such as these, are often met with complaints from native speakers of Yup'ik that the construction is "missing a verb." In order to indicate the original speaker of the REPORTATIVE-marked proposition in Yup'ik, the proposition is embedded under 'say', and the entire utterance is marked with the REPORATIVE evidential *gguq*. An example of this strategy is provided in (169c).[33]

[33]There are morphosyntactic constraints on *gguq*. It is not clear if the reportative *gguq* is actually under the scope of 'say' or not, making it a report of a report, or simply a report with an evidential for emphasis.

(169) Original Speaker and the Reportative Evidential: *Yup'ik*

(a) *Speaker-Unmarked*

*Bill-aq-**gguq*** *aya-llru-uq*

Bill-ABS.3SG=HRD leave-PAST-IND.3SG=HRD

'It's said Bill left.'

(b) *Speaker-Marked* [Attempted]

Joe-aq* *Bill-aq-gguq*** *aya-llru-uq*

Joe-ABS.3SG Bill-ABS.3SG=HRD leave-PAST-IND.3SG=HRD

(*Intended*: 'Joe said Bill left.')

(c) *Speaker-Marked*: Yup'ik Reportative + 'say'

*Joe-aq-**gguq*** *qanter-tuq* *Bill-aq* *aya-llru-uq*

Joe-ABS.3SG-ABS.3SG=HRD say-IND.3SG Bill leave-PAST-IND.3SG

'Joe said Bill left.'

The QUOTATIVE-REPORTATIVE evidential distinction is an indication of whether a reportative evidential morpheme licenses an argument position for the original speaker, and one which does not. Filling this argument position that is afforded by the QUOTATIVE is necessary in order to be grammatical, and this requirement can be illustrated with the English QUOTATIVE *according (to X)*. Adverbs *reportedly* and *supposedly*, which mark propositions learned by hearsay (170), cannot be marked with the original speaker. Similar to the objection raised by the Yup'ik speaker for (169b), it seems that (170b) is "missing a verb." In other words, the construction lacks an argument position for *Bill*.

(170) Speaker-Marking and Reportatives: *English*

(a) Supposedly/reportedly Jon won the race.

(b) *Bill supposedly/reportedly Jon won the race.

By adding the verb 'say', the REPORTATIVE can be manipulated into a quotative.[34]

(171) ENGLISH REPORTATIVE + 'SAY'

Bill said supposedly/reportedly Jon won the race.

Indicating the original speaker of a proposition learned by report is possible without the use of quotation marks or verb *say* is the function of the expression *according (to X)*. A construction with *according to* requires that its argument position be filled; the original speaker must be made explicit, as illustrated by the ungrammaticality of (172b).

(172) SYNTACTIC REQUIREMENTS OF THE QUOTATIVE EVIDENTIAL: *English*

(a) According to Bill, Jon won the race.

(b) *According, Jon won his the race.

Recall the Cora example in (162), where the proposition can be "doubly-marked" with a REPORTATIVE and QUOTATIVE evidential. This is also possible in English (173).

(173) DOUBLE-REPORTATIVE MARKING (REPORTATIVE+QUOTATIVE): *English*[35]

According to Bill, Jon supposedly/reportedly won the race.

We can conclude from the data above that the difference between a QUOTATIVE evidential and a REPORTATIVE is that the QUOTATIVE introduces an argument position for the original speaker, whereas the REPORTATIVE evidential does not. Further testing is necessary to ascertain whether the QUOTATIVE evidential is ungrammatical without the additional argument position or not in other languages. For cases where a REPORTATIVE evidential can take on a quotative interpretation when co-occurring with a verb 'say', it is the verb which introduces the argument position for the original speaker. How the morphological

[34]The same questions arise here as with Yup'ik. It is not clear if the reportative is actually under the scope of 'say' or not, making it a report of a report, or simply a report with an evidential for emphasis.

[35]Due to the fact that English evidentials are adverbs, there is not much syntactic restraint on where *reportedly/supposedly* can occur.

QUOTATIVE differs from the compositional REPORTATIVE+'say' may be a subject for further investigation at a later date, but is not addressed here.

2.2.2 The Reportative/Hearsay Evidential

As mentioned above, REPORTATIVE evidentials do not allow for the overt marking of the speaker of the reported utterance, and thus REPORTATIVE evidentials can encode second- or third-, or even n^{th}-hand reports. Some languages, such as Shipibo-Konibo, have specific REPORTATIVE evidentials to distinguish between second-hand and third-hand information (Valenzuela 2003: 42-3(21), cf. Aikhenvald 2004: 179), but this is not common. The number of intervening speakers/reporters in a report relay chain can be referred to as the degree of HANDEDNESS. An example of how reports can become altered by the number of intervening speakers is the game of "Telephone", where a high number of intervening speakers or an unknown original speaker, can call into question the veracity of the proposition and the reliability of the report.

Given the lack of overt indication of original source of the REPORTATIVE evidential, the report can be considered sourceless. There are consequences to such lack of source-specificity. According to Murray, the Cheyenne REPORTATIVE can mark a proposition which came from several sources, or one that no one actually explicitly said, was simply overheard or read about it somewhere he may not even remember. The evidence signal of the REPORTATIVE limited to the source of report, but as to the form of the report, whether it was written or oral, is not specified. The source of this report, however, can only be interpreted by the context, if it can be determined at all. In some cases this original source may not be easily identifiable; and in cases such as these, the addressee may apply a default "source-less" rumor interpretation. The Cheyenne REPORTATIVE is no different from either the Yup'ik or English REPORTATIVE evidentials, and I discuss such consequences of the lack of source-specificity here.

Same-source assumption

Due to the fact that the source of the REPORTATIVE is unmarked, the REPORTATIVE evidential, when used in consecutive utterances or narrative contexts, is generally interpreted as originating from the same speaker, or the speaker who is currently topical in the discourse (Murray 2010, following Bittner 2005, 2008; Bittner & Trondhjem 2008 for Kalaallisut *guuq*).[36] Murray argues that REPORTATIVE evidentials are "anaphoric" in the sense that the speaker of the proposition is interpretable from the discourse.[37] Murray offers the following from Faller (2002: 69), where the topical speaker of the discourse is the neighbor, who is introduced as an eyewitness to an event of hen-taking in the first clause.[38]

(174) TOPICAL SOURCE AS SOURCE OF REPORTATIVE EVIDENTIAL: *Cuzco Quechua*

(a) *Atuq-**chá*** *wallpa-y-ta* *apa-rqa-n*
fox=CONJ ben-1-ACC take-PAST1-3
'I concluded a fox took my hen.'

(b) *Ichaqa* *wasi* *masi-y* *riku-sqa*, *puma-**s*** *apa-n-man* *ka-rqa*
but house friend-1 see-SQA, puma-REP take-PAST-3-IRR be-PST-3
'But my neighbor (lit. 'house-friend') saw it [happen], and [he says] a puma took it.'

According to Faller, the Cuzco Quechua REPORTATIVE *si* carries a default interpretation that the neighbor is the source of the proposition *A puma took it* [the hen]. The neighbor

[36] According to Aikhenvald, Tariana tense-evidentiality enclitics are even dropped if the "time-evidence frame is set in the previous or following clause, or is clear from the context." (Aikhenvald 2004: 78)

[37] This is not in a pronominal/referential sense. Murray uses the term "anaphoric" very loosely and possibly incorrectly. The evidential does not introduce a referent to a previous discourse context that can be referred to in later discourse. The conversational context must be introduced explicitly.

(i) #Supposedly Bill won, but I don't believe him.

(ii) I talked to John yesterday. Supposedly Bill won, but I don't believe him.

[38] I have modified the original gloss as presented in Faller, with CONJ for conjectural *chá*, and REP for the reportative *si*.

is introduced as an eyewitness to the hen-taking event in the first clause, and thus the REPORTATIVE source is assumed to be the neighbor. This interpretation is not provided by anything inherent in the semantics of the evidential. In other words, there is nothing indexical to the source of the original utterance that is given by the REPORTATIVE. The identity of the original speaker is only implied by the context, and thus it is a conversational implicature that can be canceled. This is illustrated in the example in (175).

(175) CANCELLATION OF THE IMPLICATED ORIGINAL SPEAKER: *English*

(a) **A:** I talked to Bill yesterday. Supposedly Joe won trials.

(b) **B:** Is that what Bill said?

(c) **A:** Oh, no that's what his wife said. Bill couldn't care less about sports.

In (175b), speaker *B*'s assumption, that Bill is the source of the proposition *Joe won the race* is an implicature that can be canceled. *A* may be uncooperative here, as *A* has introduced a previous "conversational context" with Bill as the topical speaker. It seems that general assumptions and guidelines of the discourse dictate that all reported information that follows would be assumed to have come from Bill.[39] It seems that the default interpretation

[39] According to Murray, in Cheyenne, when a previous conversation context is introduced, such as a time where one was talking on the phone, in any following utterances, one is expected to mark propositions with the REPORTATIVE evidential; the use of the DIRECT evidential in this case is infelicitous.

(i) (a) *Tsé-h-méo-vóonaˈo* *ná-hkoˈéehe* *é-hoeéétse-∅*
DEP-PST-early-morning 1-mother 3-incoming.call-DIR
'Early this morning my mother called.'

(b) *NéhoˈéehE* *é-vóon-omóhtahe-**sėstse***
1.father 3-all.night-be.sick-RPT.3SG
'[She said] my father was sick all night.'

(c) # *NéhoˈéehE* *é-vóon-omóhtahe-∅*
1.father 3-all.night-be.sick-DIR
'My father was sick all night.'

(Murray (2010: 31(2.24))

According to Murray, the above examples illustrate of the "anaphoric" (how she uses the term) nature of the reportative evidential to the mother, and why the direct evidential in this case is infelicitous. The infelicity could be due to the fact that the speaker may have introduced irrelevant information.

must be explicitly canceled by the reporting speaker, however, or the default interpretation will remain.

Restriction on the REPORTATIVE *source*

The speaker of the original utterance is unmarked with the REPORTATIVE evidential (and can only be interpreted from context), but there are two people it cannot be: the speaker using the reportative evidential (1^{st} person) or the addressee (2^{nd} person). For example, one cannot reference a time when the original speaker himself, or the addressee asserted something. This restriction is indicated by the example from Faller (2002: 191-192) in (176). This is also the case for Yup'ik, English and Cheyenne (Murray 2010).

(176) ORIGINAL SPEAKER ≠ CURRENT SPEAKER OR ADDRESSEE[40]

(a) *Papa-ta-**s*** *apa-mu-wa-na-yki* *ka-rqa-n*
potato-ACC=HRD take-CIS-1O-NMLZ-2 be-PST1-3
p = 'You were going to bring me potatoes.'
EV = (i) # You told me that *p*
(ii) It is said that *p*

(b) *Papa-ta* *apa-mu-sa-yki* ni-spa *ni-wa-rqa-nki*
potato-ACC take-CIS-FUT-2 say-NMLZ say-1O-PST1-2
p = 'You said "I will bring you potatoes.'

(Faller 2002: 191-192)

The REPORTATIVE cannot be used to "quote back" something that was either asserted by the speaker or addressee, either. The verb 'say' must be used to do so, as indicated by the example in (176b). One may, however, "quote-back" with the English REPORTATIVE *supposedly/reportedly*, however this interpretation requires altered intonation.

[40]Note the term NMLZ is Faller's shorthand for *nominalizer* (2002: xiv).

(177) Reportative Evidential "Quote Back"

(a) Well, SUPPOSEDLY you were going to bring me potatoes. (You said this yesterday.)[41]

(b) Well supposedly you were going to bring me potatoes. (Someone else said this yesterday.)

Note that with *according (to X)*, this "quoting back" function seems to be extremely marked.

(178) ? According to you, you would bring the potatoes.

Due to the fact that this meaning is derived by altering the intonational contour of the utterance, this meaning should be considered to be pragmatic. It is not clear if such extended uses (with altering phonotactics) are available with other languages with REPORTATIVES, or if this is just the case of English.

Consolidation of multiple reports

According to Murray (2010) the REPORTATIVE evidential in Cheyenne can consolidate multiple instances of multiple reports when the reports that are expressed are similar in their propositional content (i.e., non-contradictory) with a single REPORTATIVE evidential; and the same is the case for Yup'ik and English. For example, you have talked to two of your friends who witnessed the finish of the Kuskokwim 300, a 300-mile sled dog (mushing) race that runs from Bethel to Aniak, Alaska and back. You were at work that day, so you were not able to see the finish of the race. Your friend Bill told you "Some guy in leopard-print snow suit won the race" and your friend James told you "The old guy won the race." You know that there is one guy, John, who wears flamboyant racing attire, and is 10 years older than the rest of the competitive field. Due to the fact that you know both these things,

[41] Some speakers report that this example is marginal, and would be even worse with *reportedly*, whereas other speakers find this example perfectly felicitous (with extreme emphasis on *reportedly*).

you assume the subject of each report has the same reference, *John*. In this case, you may simply relay the proposition with one instance of *gguq* to say it was John who won the race ("K300" is short for "Kuskokwim 300").

(179) Consolidating Non-conflicting Reports: *gguq*

*John-aq-**gguq***	*K300*	*qakvar-tuq*
John-ABS.3SG=HRD	K300	win-IND.3SG

'John won the K300.')

In the case that the reports are conflicting, a singular REPORTATIVE is not felicitous (338).

(180) Consolidating Conflicting Reports: *gguq*

# *John-aq-**gguq***	*K300*	*qakvar-tuq,*	*Bill-aq-llu*	*K300*	*qakvar-tuq*
John-ABS.3SG=HRD	K300	win-IND.3SG	Bill-ABS.3SG=and	K300	win-IND.3SG

(Intended: 'It's said that John won the K300 and Bill won the K300')

According to Murray for the Cheyenne REPORTATIVE, if there are two contradictory reports, a verb of 'say' must intervene between the conflicting reports (Murray 2010: 28).[42] According to Murray, the example below can only be interpreted as reporting two winners of two different races, however this is no way to relay conflicting reports about the winner of the same race.

[42] An issue with the example provided is that the speaker employs the conjunction *naa oha* 'and-CNTR' as an intervener, to signal two different reports. Note here Murray relays this as two separate propositions marked with two separate REPORTATIVE evidentials, with an intervening 'but'. Murray does not provide an example with an intervening verb 'say'.

(181) Consolidating Conflicting Reports: *Cheyenne*

*É-hó'tȧheva-**sėstse***	*Mókéé'e.*	(*Naa oha*)	*É-hó'tȧheva-**sėstse***	*Áméó'o.*
3-win-REP.3SG	Mókéé'e	(and CNTR)	3-win-REP.3SG	Áméó'o

'Mókéé'e won, I hear. (But,) Áméó'o won, I hear.'

[Different Races; # Same race]

(Murray 2010: 198)

Murray (following Bittner) argues that the reason that one REPORTATIVE cannot mark two conflicting reports is due to the fact that the REPORTATIVE evidential has the topical or same-source assumption, that the two reports come from one original speaker. This fact is curious, as REPORTATIVE evidentials in Yup'ik and Cheyenne are illocutionary, and the speaker is not committed to believing the propositional content marked with a REPORTATIVE of this type because they can deny felicitously subsequently deny it. One would should expect that a speaker could relay two conflicting reports marked with one reportative evidential without consequence, but this is obviously not the case. Thus this remains a puzzle for the semantics of the REPORTATIVE and the assumption of speaker neutrality.

Similarity of Propositional Form and Reportative Evidentials

One issue that still remains is what counts as similar in propositional form, that which must remain the same for the report to be marked with an evidential of the REPORTATIVE/HEARSAY or QUOTATIVE. Recall the example given in the previous chapter, where your friend who has stepped outside of the cafe where you are having coffee and returns to report that your bike is missing.

(182) Propositional Form and the Reportative

A to B: Your bike is missing from the rack.

(a) **B to C:** Supposedly/reportedly my bike is gone.

(b) **B to C:** # Supposedly/reportedly my bike has been stolen.

If your friend only tells you that your bike is missing, it is infelicitous to relay that you have heard a report that your bike has been stolen, even though it is the most obvious and logical explanation for why your bike is gone. It is only the case that you can use *supposedly/reportedly* to relay that your bike has been stolen is if someone actually tells you in a more specific way that *your bike has been stolen*, but not the exact string "your bike has been stolen." It is not the case that the original string and the reported string must be identical, as REPORTATIVE can be used with multiple reports, or reports where the referent is inferred (such as the K300 case). This is an additional issue that requires further investigation.

2.2.3 Interim Summary

As we see from the above discussion, there are two basic types of inferential evidentials, APPARENT and ASSUMED, and they are distinguished according to the type of inferential evidence expressed, although these descriptions are not specific enough to account for additional evidence contexts. In these cases the descriptions given to define the different types of inferences expressed by evidentials are not sufficient to determine whether the context is one which the speaker has evidence which correspond to an APPARENT or ASSUMED type.

Reportative evidentials are distinguished in two ways, but neither way is a matter of evidence source (they are both previous assertion). Reportative evidentials can be of the REPORTATIVE/HEARSAY and the QUOTATIVE evidential, which are distinguished according to whether the original speaker can be overtly indicated or not. Additional distinctions are made for reportative evidentials, and that is whether they are the type which requires speaker commitment of the propositional content (epistemic) and those which do not (illocutionary). There are a number of cases where given the description and what appear to be basic properties of illocutionary REPORTATIVE evidentials, where the behavior of the evidential does not fit its proposed semantics.

2.3 Formal Semantic Analyses of Evidentials

In this section I discuss some previous formal semantic proposals for evidentials in declaratives.[43] The overall schemata of formal approaches to evidentials in declaratives is represented in Figure 2.3.

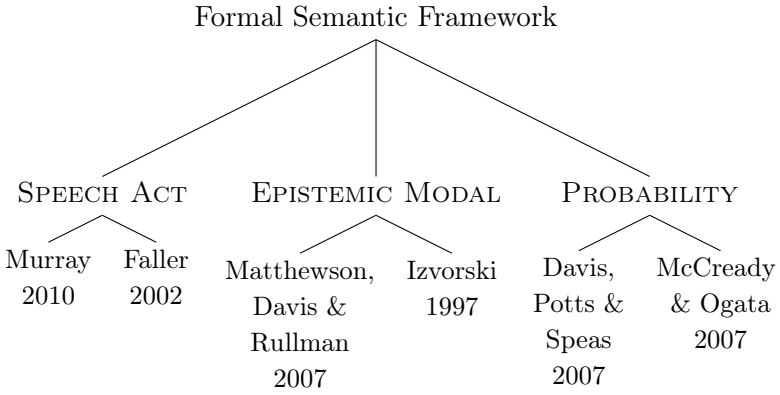

Figure 2.3: Formal Semantic Approaches to Evidentials

[43] I refer the reader to Murray (2010) for an analysis of evidentials in questions. When REPORTATIVE evidentials (or any evidential for that matter) appear in questions, the semantics of the evidential is altered. Instead of a non-at-issue assertion (discussed in this section), the evidential content is taken to be presupposed information by speaker, addressee or both (Aikhenvald 2004, Murray 2010). Take the following example of the Cheyenne REPORTATIVE evidential in a polar interrogative.

(i) *Mó=é-hó'tåheva-**sėstse*** *Andy*?
y/n=3-win-RPT.3SG Andy
'Given what you heard, did Andy win?

(Murray 2010: 41 (2.46))

In (1) above, the speaker/questioner asks whether the speaker knows if Andy won, based on what he has just heard on the phone. In this scenario, the addressee must answer the question using the REPORTATIVE evidential *-sėstse*. The use of the direct evidential in Cheyenne (-∅ DIR), is infelicitous in the above case, because it is common-grounded knowledge that the speaker (of the evidential declarative) only has reportative evidence of whether Andy won or not (Murray 2010: 41). In Cheyenne, when a speaker utters an interrogative marked with a reportative evidential, the felicitous answer that is expected is that which uses the corresponding (same) type of evidential. The role of the evidential content in interrogatives is to constrain the set of possible answers (Murray 2010: 41); I refer the reader to Murray (2010: 140-153) for more detail on her analysis of evidential interrogatives in Cheyenne.

In Figure 2.3, formal semantic analyses seem to organize themselves in terms of a modal or non-modal analysis depending on the type of reportative evidential (illocutionary or epistemic) which is found in the language of focus. With the exception of Davis et al. (2007), all proposals (Matthewson et al. 2007; Izvorski 1997; Faller 2002; Murray 2010; McCready & Ogata 2007) argue that inferential evidentials have a modal component. Faller (2002) argues that inferential evidentiality is the locus of the intersection of epistemic modality and evidentiality. In this section I discuss the speech act analyses of Faller (2002) and Murray (2010), the epistemic modal analyses of Matthewson et al. (2007) and Izvorski (1997), and finally the probabilistic approaches of McCready & Ogata (2007) and Davis et al. (2007). I focus particularly on how these approaches model the different evidence signals of evidentials and whether these approaches can provide more insight into how evidence and the evidential relate than the descriptions we find in the typological literature.

2.3.1 Faller's (2002) Speech Act Theory Analysis

According to Faller, Cuzco Quechua has the following evidentials: the DIRECT evidential *-mi*, the inferential CONJECTURAL evidential *-chá*, and the reportative evidential *si*, all enclitics (sentence-level affixes). Faller models evidentials in terms of Speech Act Theory, where every utterance is composed of a proposition, and illocutionary force (ILL), and sincerity conditions (SINC), which allow for the felicity of the illocution of the proposition in a given context. Evidentials affect the illocutionary force ILL and the sincerity conditions SINC of a proposition p. In non-evidential utterances, the illocutionary act is an assertion of p and the sincerity condition is simply that the speaker believe p.

(183) Cuzco Quechua Simple Assertion

Para-sha-n

rain-PROG-3

p= 'It is raining.'

ILL = ASSERT(p)

SINC = {*Bel*(s,p)}

(Faller 2002: 43)

Faller argues that evidentials alter the SINC component, which in turn has an effect on the ILL component of the speech act. The DIRECT evidential *-mi* has the added condition that the speaker has *Best possible grounds* (*Bpg*) for making an assertion, but this does not alter the illocutionary component. In this case, Faller alters the "strength" of the assertion, to be "+1".

(184) Cuzco Quechua Direct Evidential

*Para-sha-n-**mi***

rain-PROG-3-DIR

p= 'It is raining.'

ILL = ASSERT(p)

SINC = {*Bel*(s,p), *Bpg*(s,p)}

STRENGTH = +1

(Faller 2002: 43)

Where the DIRECT evidential is a stronger assertion than a simple non-evidential assertion, the inferential CONJECTURAL *-chá* is a weaker one. The illocutionary force of the CONJECTURAL *-chá* is a modal assertion of *possibly p*. The sincerity condition of *-chá* is also weaker than of a plain assertion, as the speaker need only believe *possibly p* and have a *reason for believing possibly p*, instead of simply *believe p*. Faller also encodes this in the strength of *-chá* as "-1".

(185) Cuzco Quechua Inferential Evidential

*Para-sha-n-**chá***

rain-PROG-3-CNJ

p='It is raining.'

ILL = ASSERT(◊p)

SINC ={*Bel*(s, ◊p), *Rea*(s, *Bel*(s, ◊p))}

STRENGTH = – 1

(Faller 2002: 44)

The REPORTATIVE *-si* is also weaker than a simple assertion, but in a different way. Here, the sincerity conditions of *-si* is that the speaker must have heard a previous assertion of *p* by someone other than himself or his addressee. In order to felicitously use *-si*, the speaker need not believe *p* or even *possibly p*. This change in sincerity conditions alters the illocutionary force entirely to that of presentation, as this evidential does not allow the speaker to assert the proposition.

(186) Cuzco Quechua Reportative Evidential

*Para-sha-n-**si***

rain-PROG-3-RPT

p='It is raining.'

ILL = PRESENT(p)

SINC = {$\exists s_2$[Assert(s_2,p) $\wedge$ $s_2 \notin$ {h, s}]}

(Faller 2002: 45)

In terms of the type of inferential evidential, *-chá* is of the ASSUMED type, which is felicitous in cases of reasoning from conjecture or general knowledge, those cases where evidentials of the APPARENT are infelicitous. Such as that which is given in (187).

(187) Cuzco Quechua Inferential: *-chá*

Context: Marya usually puts her keys in her backpack. Someone asks Marya where her keys are.

*Muchilla-y-pi-**chá***

backpack-LOC-CNJ

p = 'In my backpack.'

EV = speaker conjectures that p

(Faller 2002: 174)

According to Faller,

> The evidential requirement for *-chá* in all these cases is that the speaker arrived at a conclusion after a substantial amount of reasoning involving other propositions/premises than just the currently available direct evidence. I will call this mental process *reasoning*, which I intend to include reasoning from a set of premises as well as speculation.

(Faller 2002: 176)

This excludes reasoning that to a conclusion that the speaker takes as proven or true. (This is also the case for English *presumably, evidently* and *apparently*, and Yup'ik *llini*.)

> Thus, *-chá* cannot be used when the speaker believes (s)he has come to *know* something through his or her own reasoning. This is also the case for epistemic *must*... consider a logician who has worked hard to deduce a conclusion p from a set of premises and logical rules. Then (s)he would probably not use *must p* but *I know that p (because it is entailed by the premises)* or simply p, if (s)he is indeed convinced she made no mistake in the deduction.

(Faller 2002: 177, fn.4)

The inferential *-chá* is only felicitous in those cases where the speaker has reasoned something believed to be true, from either observation or general knowledge, however he is still not completely certain that *p* is true.

Issues for Faller's model of the evidence signal

The Cuzco Quechua inferential (CONJECTURAL) evidential *-chá* can be considered an inferential evidential of the ASSUMED type, as the evidence signal Faller proposes is not applicable for inferential evidentials of the APPARENT type.[44] One issue with the way in which the evidential signal is modeled is that the evidence in the case of the CONJECTURAL expresses only belief in possibly *p*, but not *p*. This changes the illocutionary relation of the CONJECTURAL to that of a modal assertion. Due to the fact that the force of the modal is epistemic, we would expect that the speaker could subsequently deny the proposition marked with a conjectural if it is an assertion of *possibly p*, as this is felicitous.

(188) I have reason to believe it is possibly raining, but I don't believe it.

The Cuzco Quechua CONJECTURAL, however, does not allow subsequent denial.[45]

> As with assertions containing direct *-mi*, attempts to deny that the speaker believes *p* to be a possibility embedded under *-chá* lead to Moore's paradox.
>
> (Faller 2002: 177)

This construction is also infelicitous for English *presumably*.

(189) # Presumably John won, but I don't believe it.

[44]Note that Cuzco Quechua has the expression *-chu hina*, which Faller claims focuses on the evidence that provides the trigger for reasoning, whereas *-chá* focuses on the reasoning itself. (2002: 176, fn 3) It's not entirely clear why Faller chooses to focus on *-chá* as the one inferential evidential.

[45]Faller gives an example (2002: 178), but it is not of the form '*p-chá*, but I don't believe *p*', as she gives for the direct, rather Faller gives the form '*p-chá*, but not *p-mi*', which is an entirely different type of denial.

The CONJECTURAL seems to require an additional component that this not provided by Faller's sincerity condition as formulated. Faller also draws attention to the fact that modeling the CONJECTURAL as an assertion of possibility has the effect of weakening her argument that all evidentials are of the same semantic category, and that evidentials and epistemic modals are distinct categories.

Unlike the CONJECTURAL and DIRECT, the Cuzco Quechua REPORTATIVE evidential *-si* does not require speaker commitment.

(190) *Para-sha-n=**si***, *ichaqa* *mana* *crei-ni-chu*
rain-PROG-3=REP but not believe-1-NEG
'It is raining, but I don't believe it.'
EV = speaker is/was told that it is raining

(Faller 2002: 194)

Similar to other REPORTATIVE evidentials discussed here, conflicting reports cannot be relayed with the REPORTATIVE evidential in Cuzco Quechua. For example, the following cannot be interpreted as two winners of the same race, only two winners of two different races.

(191) (a) *Marya-wan* *Pilar-wan* *llalli-rqa-n-**si***
Marya-INSTR Pilar-INSTR win-PST1-3=REP
'Marya and Pilar won.'
[#Same race; Different Races]

(i) EV = speaker has reportative evidence that Marya and Pilar won
(ii) speaker has reportative evidence that Marya won, and speaker has reportative evidence that Pilar won

(b) *Marya-**si*** *llalli-rqa-n.* *Pilar-**si*** *llalli-rqa-n*

Marya=REP win-PST1-3 Pilar-=REP win-PST1-3

'Marya won. Pilar won.'

[#Same race; Different Races]

EV = speaker was told that Marya won, and

speaker was told that Pilar won

(Faller 2002: 247)

The only sincerity condition on the REPORTATIVE evidential is that the proposition has been asserted by someone other than the speaker or his addressee. The previous assertion, we assume, was subject to the sincerity conditions of a simple assertion, that the speaker believe the propositions. Faller models the speech act of the REPORTATIVE as a function from speech acts to speech acts, taking one speech act *Assert*, and converting it to another, *Present*. This is shown in (192).[46]

(192) FUNCTIONAL MAPPING OF THE REPORTATIVE

$$\begin{array}{ll} \textsc{assert}(p) & \textsc{present}(p) \\ \textsc{sinc}=\{Bel(s,\ p)\} & \textsc{sinc}=\{\exists s_2[Assert(s_2,\ p) \wedge s_2 \notin \{h,\ s\}]\} \end{array} \rightarrow$$

(Faller 2002: 200)

It is not clear from Faller's functional mapping of speech acts to speech acts if the sincerity condition on the original report remains. That the previous assertion may have been insincere does not solve the infelicity of (191) in the case that the reports concern the same race. Recall that the REPORTATIVE can mark multiple reports that are similar but not exactly the same in terms of propositional content. Perhaps the speaker who asserted that Marya won believes Marya won, and the speaker who asserted Pilar won believes Pilar won. In both cases, the speaker was felicitous, but the report of two felicitous conflicting reports

[46] Assuming illocutionary acts are objects, see: Faller 2002, section 5.2.6.

is not felicitous. Perhaps if the two reports came from the same individual, then the reports would be considered insincere. In this case the infelicity of (191) in the case of the same race is due to the fact that the speaker reported an infelicitous assertion.

As the illocutionary force of the REPORTATIVE is that of presentation (and not assertion), the speaker is not required to believe those propositions he utters marked with the reportative. If sincerity conditions do survive functional mapping, however, then perhaps (190) would be considered infelicitous. This model of the REPORTATIVE as a simple previous report is problematic.[47]

As we can see from the above there seems to be something missing from the semantics given for the REPORTATIVE that can account for the seemingly conflicting properties of the illocutionary REPORTATIVE. Faller's proposal for the CONJECTURAL and the DIRECT does include a model of what it means to be evidence. In the case of the CONJECTURAL is used to mark the proposition, it indicates that the speaker has only a reason to believe p, in the case of the DIRECT is used to mark the proposition, it indicates that the speaker has the *best possible grounds* to believe p. The addition of the modal in the case of the CONJECTURAL seems to undermine this attempt to model the evidence expression, where she may have been able to let the variation in evidential signals do the work for her. A speaker can express either that he has the best possible grounds or a reason to believe p. In the case that the speaker only expresses they have a reason to believe p then the implicature should arise that they do not have the best possible grounds. Why the CONJECTURAL is a reason to believe *possibly* p and not simply p. It is also not clear why Faller does not give this type of an evidence connection for the REPORTATIVE, that perhaps the report affords the speaker a

[47]In terms of the semantics of evidentiality as a whole, analyzing *-si* a different speech act, classifies *-si* a different semantic type from the other evidentials. This move undermines Faller's argument that evidentials (in Cuzco Quechua at least) form a natural semantic class. In terms of Speech Act Theory, another issue for Faller's analysis is that it posits an entirely new speech act for one particle. It's not clear from Faller's discussion whether there are other constructions that also have the illocutionary force of presentation, which, if so, would argue positively for positing an entirely new speech act. In addition to these two issues, what effect the speech act of *presentation* has on the discourse is not made entirely clear by these analyses. One could also argue that von Fintel & Gillies' (2007) *proffering* or Portner's (2006, 2007) *common propositional space* may be a way to model presentation, although neither alternative has been discussed in detail.

reason to believe *possibly p*. Faller's analysis touches upon intuitions that are the focal point of the analysis here, as in terms of the explicit modeling of evidence sources Faller's is the most detailed and insightful.

2.3.2 Murray's (2010) Speech Act Analysis: Cheyenne

Murray (2010) also proposes that evidentials are complex speech acts, and assumes a model where assertions are proposals to update the common ground.[48] Murray models evidentials as proposals to update the common ground with additional structure that is not present in non-evidential proposals to update.[49] In Murray's analysis, an evidential utterance in Cheyenne is a speech act with three components: (i) a presentation of the at-issue proposition p, (ii) a non-negotiable update, which directly restricts the common ground, given by the evidential, and (iii) a negotiable update, which represents a proposal to update the common ground with p. Murray illustrates how this process works diagrammatically. In Figure 2.4, we begin with an non-intersected, initial common ground, c_0.

[48]Murray's model of assertion can be said to be more inline with Gunlogson (2001) or Ginzburg (1996), where the speaker makes a proposal to update the CG, which must be accepted by his interlocutor in order to update the CG. This diverges from a Stalnaker-type model of assertion, where an assertion made by a speaker updates the CG directly, unless it is blocked or rejected by his interlocutor.

[49]Murray's dissertation actually focuses more on evidentials in questions, for which she employs first a Hamblin (1973) semantics, and then Bittner's (2005) "Update with Centering" discourse model for Cheyenne evidentials.

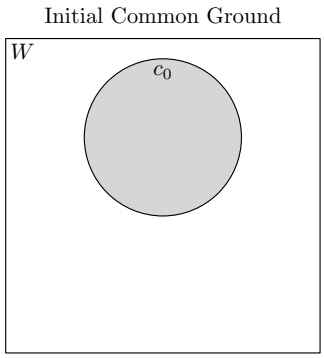

Figure 2.4: Murray's (2010) Initial Common Ground c_0

(Murray 2010: 92)

Murray proposes that the evidential utterance, *EVp* affects c_0 in two ways. By uttering *EVp*, the speaker introduces the proposition *p*, the AT-ISSUE CONTENT, which is represented by the dotted line. The evidential component of the utterance, *EV*, the NON-AT-ISSUE content is also presented, but it is non-negotiable and not available to be challenged by the addressee. The evidential update process is indicated by the solid line. The entire process at this stage is represented by the diagram in Figure 2.5.

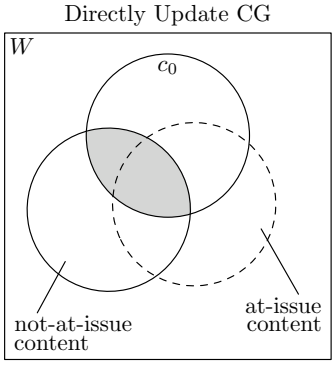

Figure 2.5: Murray's (2010) Update to c_0 with *EVp*

(Murray 2010: 92)

The evidential update functions to restrict the common ground to those relevant worlds in which the speaker has an evidence source of a particular type. The proposal to update takes place at the intersection of the three: the original common ground (c_0), the presentation of the at-issue content p, and the assertion of the not-at-issue evidential content EV. If this proposal is accepted, then the new common ground is the intersection, the darker-shaded section (c_1), and all other worlds are discarded. This final stage is presented in the diagram in Figure 2.6.

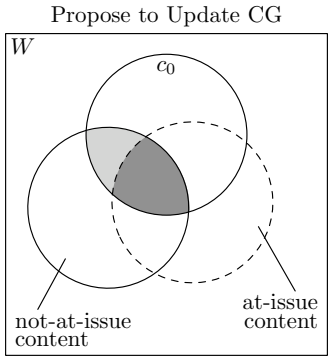

Figure 2.6: Murray's (2010) Proposal to Update to c_1

(Murray 2010: 92)

Murray summarizes the evidence signal of each of the Cheyenne evidentials as the following.

(193) (a) DIRECT = $CRT(i,\ p)$

The speaker i is certain (based on personal experience) of the proposition p that Floyd won. (2010: 96)

(b) CONJECTURAL (ASSUMED) = $CNJ(i,\ p)$

The speaker [i] has conjectural evidence for the at-issue proposition p. (2010: 100)

(c) REPORTATIVE/HEARSAY = $HRD(i,\ p)$

The speaker i heard the at-issue proposition p. (2010: 97)

In Murray's analysis it is only the speech act of the DIRECT evidential in Cheyenne (-∅), the declarative, that resembles the diagrams in Figures 2.4 - 2.6. The other two evidentials in Cheyenne are similar, but deviate slightly from this basic model.

The CONJECTURAL evidential in Cheyenne is used to express a "conjecture based on generally known facts, or specific, yet unspecified, evidence," and is similar to Cuzco Quechua (Murray 2010: 29). The CONJECTURAL is also the evidential used to mark third-hand reports. For example, an utterance made with a REPORTATIVE evidential must be marked with a conjectural when repeated (Murray 2010: 23).

The CONJECTURAL evidential in Cheyenne is not a single morpheme but a composition of three separate morphemes: a grammaticalized form of the interrogative question clitic *mó* 'cnj', modal agreement that occurs with negation *he* 'modA', and the interrogative mood suffix *he* 'y/n' (Murray 2010: 102). According to Murray, the morphological complexity of the evidential may be indicative of the source of the complex nature of the evidential restriction of the conjectural (Murray 2010: 102).

(194) CHEYENNE CONJECTURAL

***Mó**-hø'taheva-**he-he** Floyd.*

cnj+3-win-modA-y/n Floyd

'Floyd won, I take it.'/'Floyd must have won.'

(Murray 2010: 99(4.4))

Murray argues that the evidential restriction imposed by the conjectural construction $CNJ(i,\ p)$ actually imposes two restrictions on c_0, instead of the single evidential restriction imposed by $CRT(i,\ p)$. The initial state of the common ground and process of the speech act behaves similarly. We start again with the common ground c_0, and a presentation of the at-issue proposition p, indicated by the dotted line in Figure 2.7.[50]

[50]This model strays from her other evidential models, in that for some reason, the presentation of the propositional content comes prior to the evidential restriction.

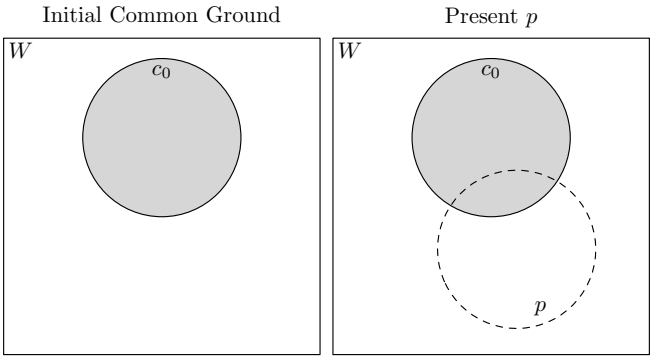

Figure 2.7: Murray's (2010) Initial Common Ground with CONJECTURAL

(Murray 2010: 110)

The not-at-issue content of the evidential $CNJ(i,\ p)$ is presented, restricting c_0 to those worlds where the speaker has conjectured that p. This step is shown in Figure 2.8.

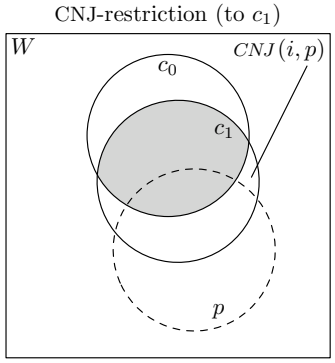

Figure 2.8: Murray's (2010) Proposal and Evidential Restriction of the CONJECTURAL

(Murray 2010: 110)

The next step is where the CONJECTURAL diverges from the model given for the DIRECT in Figures 2.4 - 2.6. Murray adds a second restriction in addition to the evidential restriction. Due to the fact that the speaker expresses he has only conjectural evidence, it carries the presupposition that the speaker is not certain, or doesn't fully know whether p or $\neg p$. The additional restriction imposed on the common ground is a presupposition given by

the CONJECTURAL, the epistemic modal expression *must*(p). Murray argues that because *CNJ*(i, p) presupposes that both $\neg p$ and p are not known, infelicitous discourses such as 'p-CNJ but $\neg$p-DIR' are ruled out, similar to the CONJECTURAL in Cuzco Quechua (Faller's Evidential Moore's Paradox). After c_1 is accepted, some $\neg p$ worlds will remain, since *must* p is weaker than p.[51] The restriction of the modal presupposition *must(p)* is indicated by the darker shading in Figure 2.9. The evidential restriction is indicated by the solid line and the proposal to update of the at-issue content, the dotted line.

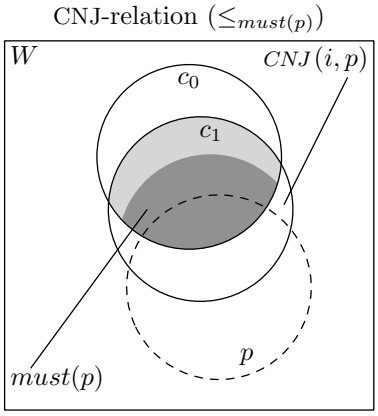

Figure 2.9: Murray's (2010) Proposal, Evidential and Modal Restriction of the CONJECTURAL

(Murray 2010: 110)

[51]The notations above the models refer to Murray's ordering analysis which she also offers (in a preliminary way) to model the evidential in terms of ordering, following standard proposals for modal ordering semantics (Stalnaker 1968; Lewis 1973, 1981; Kratzer 1981). In terms of ordering, *CNJ*(i, p) imposes an ordering on c_1 such that *must*(p) worlds are preferred over $\neg p$ worlds: $\neg p$-worlds: $\langle c_1, \leq_{must(p)} \rangle$. The worlds in which *must*(p) is true are the now top-ranked worlds, in the intersection shaded in a darker gray. Murray claims that the inclusion of a few worlds where $\neg p$ is true captures the speaker's partial commitment to the truth of p. Here, the effect of the acceptance of the proposal to add *must*(p) to c_1, is to then take the set of the top-ranked worlds in c_1 (the darker grey) as the new common ground (now presumably c_2). The new common ground should still contain $\neg p$-worlds, since the acceptance was of *must*(p), and not p. According to Murray, this captures the fact that even though the speaker believe p to be very possibly true, he is still uncertain; and that "this analysis of the illocutionary relation of the conjectural achieves the desired contrast in force with the direct evidential (as well as the reportative)." (2010: 102)

Where the CONJECTURAL is a more complex version of the evidential speech act, utterances with the REPORTATIVE are a simplified version. In Murray's model, the illocutionary relation contributed by a reportative evidential is actually not the proposal to add the at-issue proposition, but rather a signal for the interlocutor to "take note of the at-issue proposition *p*." Murray argues that "the reportative merely presents the at-issue proposition – it does not commit the speaker to the truth, or possibility, of the at-issue proposition." (2010: 98) The evidential speech act with a REPORTATIVE is actually a deficient speech act, only consisting of two parts: (i) the presentation of the proposition *p*, and (ii) the evidential restriction given by *HRD*(*i, p*). There is no step (iii), as there is no proposal to update the common ground.[52]

Murray offers the following representation of the REPORTATIVE evidential speech act, given in Figure 2.10. The evidential restriction of the REPORTATIVE is that the speaker has simply heard the proposition before *HRD*(*i, p*), which when intersected with the initial common ground c_0, creates the new common ground, c_1. The proposition is presented in c_1, but is not a proposal to update c_1; there is no change between the second and third box in Figure 2.10.

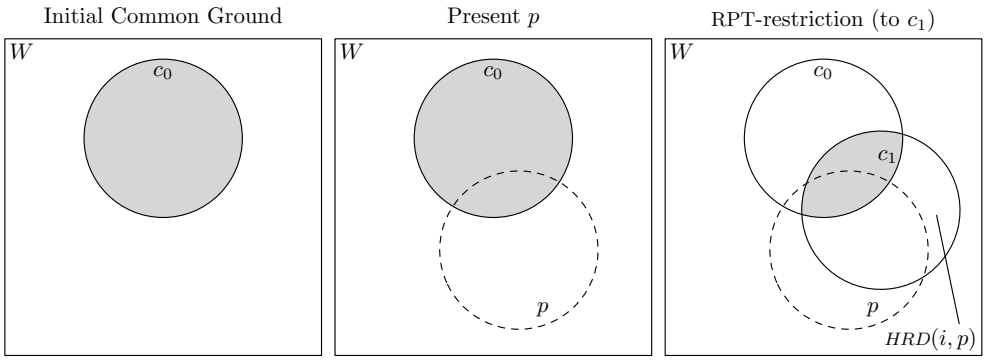

Figure 2.10: Murray's (2010) Model of the REPORTATIVE Evidential Speech Act

[52]Murray claims that a desirable aspect of her analysis does not require that the REPORTATIVE be an entirely new and different speech act type, which was an issue with Faller's proposal for evidentials in Speech Act Theory, "since the presentation of the at-issue proposition is part of all speech acts, it is part of the reportative. Therefore, it is not necessary to explicitly state an additional illocutionary relation." (2010: 98)

In Murray's analysis, the act of presenting the proposition serves to only restrict the common ground by the evidential restriction, where speaker i heard that p, and presents p, and no preference is given to p on the part of the speaker.[53] Thus the updated common ground only includes those worlds where the speaker has heard a report of p, which should also be compatible with those worlds where the speaker has heard a report of $\neg p$.

Issues for Murray's model of the evidence signal

One issue for the way in which Murray models the CONJECTURAL is that she never addresses the other evidence signal of the CONJECTURAL, where it is used to mark cases of third-hand reports, where a third-hand report is a report of and utterance marked with a REPORTATIVE evidential. It is not clear how an evidence signal of "the speaker conjectures that p" can include this use, as in this case the speaker did not conjecture that p. The speaker has a report of report in, and it is surprising that the REPORTATIVE is not used here. Murray's analysis does not provide any insight into why the REPORTATIVE is not used in this case; why evidential and evidence signal aligns in this way, such that there is some connection between conjecture and third-hand reports.

Faller modeled the evidence signal of the CONJECTURAL as believing *possibly p* because the speaker has a reason to believe *possibly p*. Murray's formulation seems to equivocate the modal expression of the CONJECTURAL evidential with the evidence signal of the CONJECTURAL; it's not clear whether the speaker actually need to have a reason he has conjectured that p, or that he simply does not know p but it is a reasonable assumption based on what he does know.

It is not clear what restriction of *CNJ(i, p)* does in Murray's model if she includes the additional restriction of *must p*. Presumably worlds in which the speaker has conjectured

[53]The notation above the figures refer to Murray's ordering analysis for the REPORTATIVE, where she proposes that the *presentation* ordering relation is a "trivial" one which ranks all c_0 worlds as equivalent ($\langle c_1, \equiv_{c_1} \rangle$). In other words, the REPORTATIVE evidential does not provide any indication of preference with respect to p or $\neg p$ on the part of the speaker. Aside from the evidential restriction, the effect of the REPORTATIVE evidential in Murray's approach has no effect on the discourse in terms of an update with respect to p.

must be those worlds where he does not know whether p or $\neg p$. There should be more worlds where *must* p is true than where the speaker has conjectured that p. The addition of the modal does not appear to decrease the area of the intersection of p, c_0, and *CNJ(i, p)*, and thus its inclusion seems redundant. Murray does avoid the issue raised for Faller's model of the evidence signal of the CONJECTURAL, which for Faller expressed epistemic possibility rather than epistemic necessity. Similar to Cuzco Quechua, one cannot subsequently deny belief in a proposition marked with the CONJECTURAL (Murray 2010: 100). It is not clear why both analyses chose to model the evidential as a modal in this case, and do not take advantage of the meaning expressed by the evidence type of inference or conjecture.

Murray's analysis of the REPORTATIVE is subject to the same issues as Faller's model of the REPORTATIVE. For example, there is no way to explain why conflicting reports when marked with the reportative are infelicitous, even though the speaker may subsequently deny a proposition marked with a REPORTATIVE in Cheyenne.

(195) CONTRADICTORY CONJUNCTIONS: CHEYENNE REPORTATIVE

*É-hó'tȧheva-***sėstse**	*Mókéé'e.*	(*Naa oha*)	*É-hó'tȧheva-***sėstse**	*Áméó'o.*
3-win-REP.3SG	Mókéé'e	(and CNTR)	3-win-REP.3SG	Áméó'o

'Mókéé'e won, I hear. (But,) Áméó'o won, I hear.'

[Different Races; # Same race]

(Murray 2010: 198)

Murray only offers a proposal for how to account for infelicitous conjunctions where the speaker uses a DIRECT evidential to mark a conjunction of two competing propositions such as in (196).

(196) CONTRADICTORY CONJUNCTIONS: CHEYENNE DIRECT

# (i)*É-hó'tȧheva-∅*	*Floyd*	(*Naa+oha*)	(ii)*é-sáa-hó'tȧheva-he-∅*
3-win-DIR	Floyd	but	3-NEG-won-*h(an)e*-DIR

'Floyd won, I'm sure, but I'm sure he didn't.'

(Murray 2010: 125)

According to Murray, (196) is infelicitous because it involves incompatible updates. The speaker proposes to update the common ground with both p and $\neg p$. The evidential functions to restrict the common ground (c_0) to those worlds he has direct, certain knowledge of p and direct, certain knowledge of $\neg p$. This explanation is not applicable for cases of the REPORTATIVE, where the speaker only presents the proposition, only proposing to update the common ground to worlds where he heard a report of p and a report of $\neg p$. There is nothing in Murray's model that should predict this to be infelicitous, as there should be worlds where a speaker has heard a report of p and $\neg p$, but perhaps not from the same person. Unlike Faller, however, the way in which the evidential content in Murray's model is structured does not provide that the original assertion need to have even been sincere. It is also not inherent to the semantics of the REPORTATIVE that the speaker is singular, as the REPORTATIVE can condense multiple reports, but just not mark two conflicting reports. In Murray's model, there is no restriction on what a speaker may present, and thus one should be able to present two contradictory propositions, or present one and propose to update with another without issue. This is a problem for any analysis which models the REPORTATIVE in this way.

2.3.3 Issues for Present or Neutral Models of Reportative Evidentials

Any model in which propositions marked with a REPORTATIVE do not affect the common ground, or express the implication of lack of speaker commitment in the semantics of the REPORTATIVE, seems miss some very basic facts with respect to the REPORTATIVE. In these cases, proposals for the REPORTATIVE seem to be too sensitive to the implicatures of the REPORTATIVE, but not the semantics of the REPORTATIVE and the general sincerity conditions present in a discourse context.

Implicature 1

The first implicature that arises is due to the fact that the REPORTATIVE evidential is unmarked for source. Unless it is indicated otherwise, the propositions that are subsequent to one which is marked with a REPORTATIVE evidential are assumed (by the discourse participants) to have come from the same original speaker (usually singular). Murray describes the infelicity that arises in (195) is due to this assumption, that the speaker reports a single speaker who has asserted a contradiction. To present contradictory statements should not be a problem for Murray's or Faller's model, given that presentation is not endorsement; it is not clear how Murray's or Faller's version of presentation can account for why attempts to present contradictory statements with reportative evidentials are infelicitous.[54]

Implicature 2

The second implicature that arises with the REPORTATIVE is that the speaker's evidence may be unreliable, or that the speaker may want to distance himself or remove responsibility from the utterance. This is an implicature that can be strengthened (197i') or weakened (197i'').

(197) Supposedly/Reportedly John won the race ...

Well, that's what Bill told me.

(i') And Bill was there to see it.

(i'') But we all know Bill does not always have the best info.

If neither is done, then the utterance will be assumed by the addressee to be endorsed by the speaker, as shown in (198). In this example the denial of the propositional content is performed past the window where denial of propositional is felicitous (e.g., after a turn).

[54]In Faller's model at least, the original speaker must be assumed to have made a felicitous assertion, that he has direct evidence for p. This would work if there were a further condition that the evidential is taken to be a singular source, but that is not part of the evidential's semantics, which Faller provides.

(198) Window of Deniability

(a) **A to B:** Supposedly/Reportedly John won the race ...

(i') **B to A:** That's good, he works hard.

(i'') **B to A:** Unbelievable! He must have had a huge sprint!
(He was way behind at the start.)

(b) **A to B:** #? Well I don't think he did.

An utterance of p with a REPORTATIVE evidential can license subsequent discourse that can only follow felicitously if it is under the assumption that the speaker believes p, or at least the addressee accepts p, which without a proposal to update, there is nothing to accept. Examples are given in (199 - 200).

(199) (a) **A to B:** Supposedly John won the race.

(b) **B to A:** Good for him.

(200) Reportative Evidence and Licensing Necessity

Context: You are on vacation and have checked your hometown weather report, which stated that there was a violent hail storm which resulted in massive damage for much of your town.

You say:

(a) Supposedly/Reportedly, there was a hailstorm back home.

(b) We should go back to see that the roof isn't damaged.

If an utterance with the REPORTATIVE were truly presentational it should not be able to be accepted as if the speaker had asserted the proposition marked with a REPORTATIVE, or license a continuation with modals *should* (200) or *must* (198). The acceptance of p by the addressee seems to indicate that the addressee assumes that in each case the speaker believes p, that *John won* or *It hailed*. If it were the case that the speaker were neutral with

respect to p, when marked with the REPORTATIVE, then the addressee would not continue the discourse in this way, such that it appears the common ground has been updated. For the speaker to express doubt in the proposition, and block the addressee from making this assumption, then he must cancel the implicature of endorsement it overtly.

Implicature 3

Another assumption in some analyses is that hearsay evidence of the REPORTATIVE is an evidence source that is weaker than the CONJECTURAL. A problem for a presentation type of analysis, is the following example from Faller (2002), known as the "Pedro's Hen" scenario. In this scenario, a farmer, Pedro, comes back to find that one of his hens is missing. There is a trail of feathers and some blood around the henhouse. Pedro knows that foxes sometimes steal hens. Pedro also runs into his neighbor, who informs him that she saw a puma take his hen. Pedro has two types of evidence sources with respect to the fate of his hen, which are listed in (201).

(201) PEDRO'S HEN SCENARIO: Evidence for the Evidential

(a) GENERAL KNOWLEDGE

Blood, a trail of feathers, and the knowledge that foxes eat hens

(b) PREVIOUS ASSERTION

A neighbor's eyewitness report, that she saw a puma leave with hen in mouth

These two evidence sources can be relayed with CONJECTURAL and REPORTATIVE evidentials, respectively (202).

(202) TWO EVIDENCE SOURCES, ONE PROPOSITION

(a) CONJECTURAL

*Atuq-**chá** wallpa-yki-ta apa-rqa-n*

fox-CNJ hen-2P-ACC take-PST1-3

p='A fox must/could have taken my hen.'

EV= speaker conjectures that p

(b) REPORTATIVE

*wasi-**si*** *wallpa-y-ta* *apa-sqa*

puma-REP hen-1-ACC take-PST2-3

p='A puma took my hen.'

EV= speaker was told that q

(Faller 2002: 68)

According to Faller, Pedro chooses to relay the eyewitness report, thus the REPORTATIVE evidential, over his inference, and thus the proposition marked by INFERENTIAL/CONJECTURAL evidential. This is illustrated in (203).

(203) TWO DIFFERENT CULPRITS: REPORT OVER CONJECTURE

(a) *Atuq-chá* *wallpa-y-ta* *apa-rqa-n*

fox=CNJ ben-1-ACC take-PAST1-3

'I concluded a fox took my hen.'

(b) *Ichaqa* *wasi* *masi-y* *riku-sqa*, *puma-**s*** *apa-n-man* *ka-rqa*

but house friend-1 see-SQA, puma-REP take-PAST-3-IRR be-PST-3

'But my neighbor (lit. 'house-friend') saw it [happen], and [he says] a puma took it.'

(Faller 2002: 69)

It's not the case, however, that Pedro is being infelicitous or confusing in the above. Rather, it seems that Pedro offers the hearsay evidence of the puma-witnessing as a better evidence source than his conjecture. In doing so, Pedro seems to indicate that he has canceled the proposal to update the common ground given by his conjecture. There is not

an analysis given that addresses how offering a potentially contradictory proposition with another evidential can indicate a cancellation of the previous evidential.

Faller (2002) explains why the above example is not infelicitous. Faller first assumes that any evidential discourse is subject to the EVIDENTIAL MAXIM, to base what you say on the strongest evidence available to you (Faller 2002: 76). Given that there are "best" and "better" forms of evidence, evidentials are ranked on a hierarchy. Ranking evidentials in a single hierarchy is extremely problematic, particularly for cases of the REPORTATIVE and the ASSUMED (Faller 2002).[55] To circumvent this issue, Faller proposes a split evidence hierarchy, based upon whether the evidence source type involves reasoning or human cognition, a PERSONAL EVIDENCE CLINE, or number of intervening speakers, the MEDIATED EVIDENCE CLINE.[56]

(204) FALLER'S EVIDENCE CLINES

(a) **Personal Evidence Cline**

PERFORMATIVE > VISUAL > AUDITORY > OTHER SENSORY > INFERENCE FROM RESULTS > REASONING > ASSUMPTION

(b) **The Mediated Evidence Cline**

DIRECT > SECONDHAND > THIRDHAND > HEARSAY/FOLKLORE

(Faller 2002: 70)

Assuming Faller's Speech Act analysis and evidential clines, the utterances given in (350a - 350b), are not ranked with respect to each other. In the split-hierarchy, (350a), that a fox took the hen, is evaluated on the personal evidence cline, whereas whether it was actually a puma, expressed in (350b), is evaluated on the mediated evidence cline. This explanation still does not account for why the preference for the neighbor's report over his own

[55]Problems included ranking evidentials and not evidence sources, and some languages which rank REPORTATIVE > INFERENTIAL/ASSUMED and some that rank INFERENTIAL/ASSUMED > REPORTATIVE.

[56]The reasons why this is necessary is discussed in the next chapter.

conjecture is the case, nor why a speaker would follow an assertion of *possibly p* (the illocutionary relation of the CONJECTURAL with a presentation of q (the illocutionary relation of the REPORTATIVE), and why this is felicitous. It seems that modeling the REPORTATIVE as presentation and not assertion, without any additional conditions on the speech act of presentation, is problematic.

2.3.4 Modal Analyses: Epistemic Necessity + Evidence Presupposition

Both Izvorski (1997) and Matthewson et al. (2007) analyze the evidentials in their respective languages of study as epistemic necessity modals that also carry a presupposition of an evidence source type.

Izvorski 1997

Izvorski argues that when a speaker utters a proposition marked with a perfect of evidentiality, such as the Bulgarian present perfect and Turkish *-mIş*, he makes a modal assertion of that proposition, $\Box p$, which carries with it the presupposition that the speaker has indirect evidence for p.

(205) Izvorski (1997): The interpretation of EVp

(a) Assertion: $\Box$p *in view of the speaker's knowledge state*

(b) Presupposition: *Speaker has indirect evidence for p*

(Izvorksi, 1997: 5)

Izvorski adopts Kratzer's (1991) possible worlds semantics, where modals are expressions which quantify over possible worlds, either existentially (at least one world) or universally (all worlds). In addition to quantification, modals also vary along two contextually-determined parameters: (i) a MODAL BASE, which assigns any possible world w, from the set of all possible worlds W, those propositions which are assumed to be true in w; and (ii)

an ORDERING SOURCE, which orders the possible worlds (that have been determined by the modal base). Izvorski's analysis adopts an EPISTEMIC modal base, with a STEREOTYPICAL ordering source. The stereotypical ordering source orders possible worlds with respect to how these possible worlds align with our assumptions about how events normally unfold.

One issue for Izvorski's analysis of the evidential signal of the evidential perfect is that the evidence source associated with the evidential perfect can either be inferential or hearsay, which we also see in the case of English *evidently/apparently*. In some cases only the hearsay evidence signal interpretation is available. According to Aksu-Koç & Slobin (1986), when *-mIş* marks a stative predicate, a habitual process, or statements about future events, only a reportative interpretation is available, shown in the examples given in (206).

(206) HEARSAY-ONLY EVIDENTIAL PERFECT: *Turkish*

(a) *Iksender bura- da- **ymış***
Iksender here LOC PE
'Iksender is here.'

(b) *Her gün koç- uyor- **muş***
every day run PRES PE
'(it is said that) He jogs every day.'

(c) *Yağmur yağ- acak- **mış***
rain[NOUN] rain [VERB] FUT PE

$$\begin{pmatrix} \neq & Inferred & it & will & rain \\ = & Reported & that & it & will & rain \end{pmatrix}$$

(Aksu-Koç 1986: 161)

In addition to the above cases, a proposition marked with the evidential perfect (PE) can be felicitously subsequently denied (as with English *evidently/apparently*). In this case, the felicitous interpretation of the evidence signal available is that the speaker has hearsay

evidence for the proposition. The default interpretation of the PE, that the speaker has inferential evidence, is not available as a felicitous interpretation of the evidential if the proposition it marks is subsequently denied.

Issues for Izvorski's model of the evidence signal

One issue with Izvorski's analysis, raised by Matthewson et al. (2007), is that if the perfect of evidentiality expresses a necessity modal, then Izvorski's analysis would predict the above to be an assertion of $\Box p$ *and not-believe* p, where utterances of this form should be infelicitous, but this is not the case with perfects of evidentiality.[57,58]

Izvorski's analysis of the evidence signal does not explain the hearsay-inference alternation of the perfects of evidentiality. The evidence signal, as formulated as expressing one has "indirect evidence", does not account for infelicitous scenarios either. According to Izvorski, the drunken wine scenario is infelicitous in the case where the speaker only has knowledge that John is someone who likes wine a lot. Izvorski argues that in this case, there is not "indirect evidence" that John drank the wine, but it is not clear from Izvorski how one determines when he has "indirect evidence" and when he does not. Izvorski does not clarify what is meant by "indirect evidence" that is intended to eliminate evidence of inference from general reasoning, as it must include observational result of an event and hearsay under a single evidential category. We would expect that these two source types must then be related in some way in which general reasoning is not, yet this is never made clear, and the evidence signal as expressed is less informative than Izvorski assumes it to be.

[57]This may depend on the details of the modal parameters.

[58]Matthewson et al. (2007: 211) argue that the way in which Izvorski has modeled the modal aspect of the evidential, to quantifies over those worlds compatible with the actual world, will also include the actual world in the set of possible worlds over which the modal quantifies. Matthewson et al. argue that this is problematic for both inferential and hearsay evidence cases, but reportative cases in particular, because Izvorski's analysis makes claims about the entailment relation between an assertion of a proposition and the truth of a proposition that are too strong. Matthewson et al. claim that Izvorski's analysis predicts that in all worlds where Mary said John drank the wine and Mary is reliable, then the proposition *John drank the wine* is true.

Matthewson, Davis & Rullman 2007

Matthewson et al. (2007) argue that since the St'át'imcets evidential utterances are only felicitous if the speaker believes the proposition, including the reportative *-ku7*, all of these evidentials carry the equivalent modal force of epistemic necessity. What makes St'át'imcets evidential modals distinct from non-evidential epistemic modals, is that St'át'imcets evidentials vary in terms of the source, and not force. For example, where the English epistemic modals *must* and *might* vary in terms of whether they quantify over all possible worlds or at least one world, St'át'imcets evidential modals quantify over all worlds in which the speaker has the particular evidence source type expressed by the evidential. All St'át'imcets are equivalent in terms of their force, which is universal by default.

According to Matthewson et al., there are three different evidence source types: *inference, perceived evidence*, and *hearsay*. Matthewson et al. adopt Willet's (1988) descriptions of the ASSUMED and APPARENT for St'át'imcets INFERRING and PERCEIVED EVIDENCE modals, respectively (see (228)). The list of the St'át'imcets evidential modals, descriptions of the evidence signal, and evidential classification is given in (207).

(207) St'át'imcets Evidential Modals

ku7	indirect reportative evidential (reportative) = REPORTATIVE
k'a	indirect inferring evidential (inferential) = ASSUMED
-an'	inferring evidential of result (perceived evidence) = APPARENT

(Matthewson et al. 2007: 204, 209)

According to Matthewson et al., the evidence signal of the evidential modal is expressed as a presupposition, which restricts the set of relevant worlds to those worlds where the speaker has that source type. Once restricted, the modal component of the evidential quantifies over the new relevant set of worlds with the modal force which is by default, epistemic necessity.

Their proposal follows Klinedinst's (2005) analysis of modals as existential quantifiers over pluralities of worlds. In Klinedinst's proposal, modals are interpreted with respect to a modal base B and a possible world w (the world of evaluation). $B(w)$, then, is the set of worlds accessible from w, determined by B. The formula below can be summarized as expressing that there is a set of worlds W, accessible from the evaluation world w, such that a proposition p is true in all worlds in W.

(208) KLINEDINST'S (2005) PROPOSAL (cf. Matthewson et al. 2007: 242)

MODAL(p) is true with respect to a modal base B and a possible world w iff:

$\exists$W[W $\subseteq$ B(w) $\wedge$ W $\neq \varnothing \wedge \forall$w'[w' $\in$ W $\rightarrow$p(w')]]

Matthewson et al.'s analysis of evidential modals modify Klinedinst's proposal in order to allow the modal quantify over specific possible worlds. According to Matthewson et al., the choice function f (following Reinhart 1997; Winter 1997; Kratzer 1998; Matthewson 1999), "will pick out a subset of the possible worlds that are accessible from the actual world" (2010: 243). Matthewson et al.'s model has a total of two contextually-determined parameters, a modal base B and the choice function f. B functions to initially select set of worlds accessible from the evaluation world, $B(w)$. f selects the subset of those worlds in $B(w)$ (where for any set of worlds W, $f(W) \subseteq W$). Both these parameters are contextually determined, and any evidential modal utterance must be evaluated with respect to a context c and world w.

(209) KLINEDINST-STYLE [EVIDENTIAL] MODALS (Matthewson et al. 2007: 243)

$[[\text{MODAL(p)}]]^{c,w}$ is only defined if c provides a modal base B.

If defined, $[[\text{MODAL(p)}]]^{c,w} = \lambda f_{<st,st>}.\ \lambda p_{<s,t>}\ .\ \forall$w'[w'$\in$**f(B(w))**$\rightarrow$p(w')]]

For Matthewson et al., the universal quantificational force evidential modals carry is only universal by default, but it can vary, expressing strong or weak necessity.

(210) VARIATION OF MODAL FORCE: St'át'imcets *k'a*

t'cum	***k'a***	*kw*	*s-John*
win(MID)	INFER	DET	NOM-John

'John must/may have won.'

(Matthewson et al., 2007: 244)

Matthewson et al. claim that the force associated with the evidential modal depends upon the size of the f-selected subset, $f(B(w))$, as "the larger the subset of $B(w)$) that f selects, the stronger the proposition expressed." (2007: 243)

The number of worlds selected by f may determine the force of the modal, but the primary function of the choice function f is to select those worlds in which the speaker has evidence of the corresponding type. Thus the variation in the source types of evidential modals is determined by the specific worlds which are in the selected modal base. In the case of the inferential evidential *k'a*, the modal base contains all those worlds where the speaker has "inferential evidence".[59]

(211) SEMANTICS OF INFERENTIAL EVIDENTIAL *k'a* [ASSUMED]

$[\![\text{k'a}]\!]^{c,w}$ is only defined if c provides a modal base B such that for all worlds w', w' $\in$ B(w) iff the inferential evidence in w holds in w'.

If defined, $[\![\text{k'a}]\!]^{c,w} = \lambda f\ \langle \text{st,st}\rangle.\lambda p\langle \text{s,t}\rangle.\forall \text{w'}[\text{w'}\in \mathbf{f(B(w))} \rightarrow \text{p(w')}]]$

(Matthewson et al., 2006: 245)

The semantics of the perceived evidential *-an'* and reportative *ku7* only change in terms of the composition of the modal base. In the case of the perceived evidential *-an'*, the modal base contains all those worlds in which the speaker has "perceived evidence". For the

[59]It should be noted that Chung (2005) argues similarly for the Korean perfect/indirect evidential *-ssa*.

reportative *ku7*, the modal base contains all the worlds where the speaker has "reportative evidence".

Issues for Matthewson et al.'s model of the evidence signal

One issue for Matthewson et al.'s analysis is that it does not reflect the relationship between the inferential *k'a* and the perceived evidential *-an'*. According to the description by Matthewson et al. (2007: 207) "*-an'* is usable in a subset of cases where *k'a* is." If those cases where *-an'* is felicitous are a proper subset of those cases where *k'a* is, then Matthewson et al.'s analysis would seem to predict that cases of *-an'* are always a subset of the cases of *k'a*, and thus the size of the set of worlds in the selected set of *-an* should be always be smaller than those cases with *k'a*. We would anticipate that in those cases where both *-an'* and *k'a* are true, and the proposition is marked with *k'a*, and implicature should arise. This is not reported, however, as Matthewson et al. claim that speakers do not give preference to *-an'* in those cases in which both *-an'* and *k'a* are felicitous (2007: 249, fn. 8).

Similar to Izvorski's analysis, it is not readily clear what counts as each of these evidence types as described, and thus how one determines what "inferential evidence" or "perceived evidence" truly are, or how those cases where "reportative evidence" is a report that the speaker believes are selected. Presumably, *-an'* patterns similarly with the APPARENT, but given that "observable indirect evidence", is not specific enough to account for those cases in which the APPARENT is infelicitous, neither is "perceived evidence". In cases such as the Lost Keys or Gross Food (disgusting soup) scenarios, there is what should count as "perceived evidence", but it is not such is able to license the felicitous use of APPARENT. Thus without further instruction on what counts as evidence, we would expect that the modal base would contain incorrectly-selected worlds. It seems that Matthewson et al.'s analysis assumes too much about the nature of and relationships between evidentials and evidence source types.

2.3.5 Evidentials as Conditional Probabilities

McCready & Ogata (2007)/McCready (2010) and Davis, Potts & Speas (2007) analyze evidentials as expressing a conditional probability update.

McCready & Ogata 2007/McCready 2010

McCready & Ogata (2007) provide the following list of Japanese modals they argue to be evidential (212).

(212) Japanese (evidential) modals

rashii	inference from senses (limited), hearsay
Infinitive+*soo-da*	inference from senses, world knowledge, subjective knowledge
mitai	inference from senses
yoo-da	inference from senses
S+*soo-da*	hearsay

Discussion of McCready & Ogata's analysis that is included here is limited. There are some issues with their analysis which go beyond the problems of the evidential signal, and thus the focus here is on their basic proposal for analyzing evidentials as conditional probability operators.

McCready & Ogata (2007; McCready 2008; 2010), argue that evidentials function as conditional probability operators, that the probability of p, given e, is higher than it is without e. McCready & Ogata argue that for an evidential update to occur, the context must be such that the proposition was less likely at some time before introduction of the evidence (213a); the speaker does not know the proposition to be true (213b); and finally, the probability of the proposition remained constant (did not decrease) in the time between acquisition of evidence and the evidential update (213c).

(213) $\Delta_a^i\varphi$ is true given a world w, time s, and probability function μ iff:

(a) φ was less likely at some time preceding s (before introduction of some piece of evidence i);

(b) φ is still not completely certain at s (given i);

(c) the probability of φ never decreased between the time the speaker became aware of the evidence i and s as a result of the same piece of evidence i (i.e., the probability of φ given i is upward monotonic).

(McCready & Ogata, 2007: 186(64))

McCready & Ogata model the evidential as the evidence predicate $\mathbf{E}_a^i(\varphi)$, which indicates that φ is evidence acquired via means i by agent a (McCready & Ogata 2007: 184). The way in which McCready & Ogata formulate the evidence predicate is somewhat confusing, but we can fix this by assuming that the evidence predicate takes a proposition ψ as an argument, as φ must be evidence for something. I have adapted the entry for the evidential update given in McCready (2010: 112) to reflect this change in (214) below.[60]

[60]In McCready & Ogata's formulation, a speaker a has learned something φ by i means, where the means is what we have been thinking as the evidential types: hearsay, inference, direct witnessing, etc. McCready & Ogata are somewhat inconsistent in their terminology and discussion, as sometimes $\mathbf{E}$ is evidence and φ is evidence. Here φ serves as evidence for another proposition ψ, a conditional probability update. The process, which McCready gives in a later paper (2010: 112) is provided below. Notice that the update affects a proposition ψ, but there is no ψ expressed by the evidential utterance, only the evidence predicate is expressed. The way in which McCready has formulated the evidential expression is such that the speaker utters the evidence predicate, and somehow another proposition is affected.

(i) $\mathbf{E}_a^i\varphi$

(a) changes the probabilities assigned to every proposition ψ (excluding φ itself) in the current information state σ by replacing them with the conditional probability of ψ given φ, if defined

(b) replaces the modal accessibility relation with one restricted to worlds in which φ holds.

(McCready 2010: 112)

McCready continues on to claim:

(214) Evidential Conditional Probability Update (Adapted)[61]

$\mathbf{E}^i_a\varphi(\psi)$ ...

(a) changes the probabilities assigned to ψ in the current information state σ, by replacing them with the conditional probability of ψ given φ, $Prob(\psi|\varphi)$, if defined

(b) replaces the modal accessibility relation to one restricted to worlds in which φ holds.

The introduction of the evidence proposition φ (acquired by i means by agent a), increases the probability of ψ. If φ is true, then the probability of ψ is updated to the new value given by the conditional probability, $Prob(\psi|\varphi)$.

It is not clear from McCready & Ogata what does the probability raising. One issue with conditional probabilities alone modeling evidence is that probabilities can increase conditionally with or without having an evidential or explanatory connection (Achinstein 1983).[62]

> Here conditional probability is defined in the standard way: the probability of the conjunction of the new information with the old divided by the probability of the old (where the probability of ψ is understood just as the proportion of the domain of worlds W in which ψ holds).
>
> (McCready 2010: 112)

He then provides the following:

$$(\phi|\psi) = \frac{\phi \cap \psi}{\phi} \tag{2.1}$$

Since ϕ and ψ are propositions, and not probabilities, the above formula is not well-formed, and must be modified.

$$Prob(\phi)|\psi) = \frac{Prob(\phi \cap \psi)}{Prob(\phi)} \tag{2.2}$$

[61] Original: McCready (2010: 112)

[62] Let us construct a toy example to illustrate that conditional probability increase and confirmation of evidence are not the same. We can use the lost-keys scenario. Imagine that the speaker takes the following conditional to be a rule of thumb.

(i) If my keys are not in my coat pocket, the jar by the door, or the kitchen counter, then they are in my car.

Our toy probability space holds the above four propositions as live options, and ascribe dummy probability values for them. For argument's sake, we can make the car perhaps the least likely based

McCready & Ogata argue that the conditional probability increase only applies to inferential evidential; and that the reportative evidential modals *S+soo-da* and $rashii_H$ do not update probabilities, and thus argue that reportative evidentials in Japanese are thus non-probabilistic. If this is the case, then there is no such thing as hearsay evidence if evidence is that which updates probabilities. McCready & Ogata propose the reportative evidentials are "simple tests for the existence of a past event of acquiring hearsay evidence for φ" (2007: 187), which is given in (215).[63]

(215) $\mathbf{H}_a\varphi$

Indicates that a has experienced an event of acquiring hearsay knowledge $\mathbf{E}^h_a\varphi$, at some past time.[64]

on its "last option" status. We provide the "before" probability space and the "after" probability space, as affected by the acquisition of evidence, where evidence E = *my keys are not in my coat pocket, the jar by the door, or the kitchen counter.*

(ii) Probabilities in Evidence-Acquisition Scenario

	Pre-**E** Probabilities	Post-**E** Probabilities
Keys in coat pocket	0.3	0.0
Keys in jar	0.3	0.0
Keys on kitchen counter	0.3	0.0
Keys in car	0.09	0.7
Keys dropped in snow	0.01	0.3
Sum of Probabilities	1.0	1.0

Given **E**, the first three propositions given in (2) are now valued at 0, because they are very clearly false. By definition of the probability calculus (PC), the probability space must sum to 1.0. By dropping the probabilities of the false propositions to zero, the speaker must then revise the value of the probabilities of the other live options, or those which were valued very low. Following the rule of thumb, the proposition *My keys are in the car* is now given a much higher probability. In this case, McCready & Ogata's model predicts that the use of the evidential should be felicitous: the probability of the proposition definitely increased due to some evidence, and the inferential evidential (such as the apparent) should be good– but it isn't.

[63]It is not clear what they mean by a "test". We can speculate that this is a way of saying that the evidential carries the presupposition that the speaker has heard the proposition before, but perhaps this is just our speculation.

[64]The reportative evidential does not alter the probability of a proposition φ, rather the above is simply a shorthand for $\mathbf{E}^h$, and is only a "test" of whether there is hearsay evidence for a proposition. Here again, McCready & Ogata are inconsistent with what is the proposition in question (or hypothesis in Bayesian terms) and what is the evidence proposition. Technically, the test of the hearsay evidence should be a test of having heard some assertion of ψ. The way in which the evidence predicate is formulated, φ is the evidence.

(McCready & Ogata, 2007: 187(67))

McCready & Ogata argue that the only effect of the reportative evidential $\mathbf{H}_a$ is to restrict the set of possible worlds to those worlds in which the hearsay evidence holds, when evaluating p. $\mathbf{H}_a$ cannot affect probability, and thus the speaker does not convey any probability change to the proposition marked with the reportative. According to McCready & Ogata, Japanese reportative evidentials are expressions that "have no modal meaning at all, and also involve no assertion on the part of the speaker" (McCready & Ogata 2007: 153).

It is here that McCready & Ogata equivocate what aspect of these expressions contribute to the probability update, the modal aspect of the or the evidential. Since Japanese reportatives are evidential but non-modal, it appears that the former is the case. In modeling the reportative evidentials as non-probabilistic, McCready & Ogata's analysis is similar to the "present"-type analyses discussed in the previous section, and thus subject to all of the same issues raised for Faller (2002) and Murray (2010) (see the discussion in section 2.3.3).

Issues for McCready & Ogata's model of the evidence signal

One issue for McCready & Ogata's model is how inferential evidence types correspond to probability values, whether they are also assigned by some natural law or real world knowledge or they are assigned by context. In either case, it is not clear how probabilities do the job of distinguishing each evidential signal. McCready & Ogata list many of the evidentials in (212) as having an evidence signal of 'inference from senses'. Each inferential evidential appears to have subtle differences in meaning, yet these subtleties are not captured in the definitions of the evidentials.

> According to Aoki (1986), *yoo-da* is used when the speaker has 'visible, tangible or audible evidence collected through his own senses' that is then used in making the inference to the content of the *yoo-da*-marked sentence. He has nothing to say about *mitai*, but it seems to be similar in this respect. There are differences,

however... These evidentials differ from *rashii* in being acceptable with evidence obtained through tactile and visual sources.

(McCready & Ogata 2007: 160-161)

How probability values can capture those differences between tactile, visual and audible evidence sources, which are not even distinguished in the descriptions of the evidentials, is not clear. The proposal of McCready & Ogata is interesting in that it attempts to combine the traditional Bayesian view of evidence and conditional probability update and the linguistic expression of such, however their formulation does not seem to meet their desired goals, or provide a better understanding of how evidence and evidentials align.

Davis, Potts & Speas 2007

Davis, Potts & Speas (2007) model the evidential contribution to an utterance as many others do, that an evidential-marked proposition commits the speaker to having a particular evidence type for that proposition.

(216) Uttering S[**ev**] commits the speaker to the existence of the situation in which he receives **ev**-type evidence for [[S]].

(Davis et al. 2007: 7)

The authors assume Potts' (2006) model of the discourse. In a discourse context, there is a CONTEXT THRESHOLD (c_τ), which is the minimum probability value at which a speaker must assert a proposition in the discourse context. We assume that c_τ is the minimum probability which a speaker must assign p in order to assert it, as in order to be felicitous, a speaker may only assert those propositions which they believe to be very probably true, following the definition of *Quality* given in Lewis (1976), rather than Grice (1975). To determine how one values the probability of p, Davis et al. model speaker belief in terms of a subjective probability distribution C of a speaker A in a context c. For details with respect to the construction of the subjective probability space, I refer the reader to Davis et al. (2007: 7).

(217) The subjective probability distribution for an agent A in context c:

$C_{A,c} \stackrel{def}{=} P(||\ \mathrm{Dox}_{A,c})$

in which P is a uniform distribution over W, i.e., $P(\{w\}) = \frac{1}{|W|}$ for all $w \in W$.

(Davis et al. 2007: 7)

Davis et al. provide some suggested values associated with $C_{A,c}$ from full belief to downright disbelief in (218).

(218) Sample Values of $C_{A,c}$

a.	$C_{A,c}(p) = 1$	A fully believes p
b.	$C_{A,c}(p) = .5$	A is unbiased about p
c.	$C_{A,c}(p) = .98$	A strongly suspects p
d.	$C_{A,c}(p) = 0$	A disbelieves p

(Davis et al. 2007: 7)

Thus, in any context, an agent A can only felicitously assert p if $C_{A,c}(p)$ exceeds the quality threshold c_τ. This is given in (219) below.

(219) (a) Every context c has a quality threshold $\mathrm{c}_\tau \in [0,1]$.

(b) An agent A can felicitously assert p in context c only if $C_{A,c}(\mathrm{p}) \geq \mathrm{c}_\tau$

(Davis et al. 2007: 8)

In most contexts, if A is unbiased about p, they cannot assert p given the value provided for indifference, $C_{A,c}(p) = .5$. In normal discourse contexts c_τ is assumed to be very close to 1. Thus, $C_{A,c}(p) \ngeq \mathrm{c}_\tau$.

The analyses of Davis et al. proposes that the evidential context is not a normal context. For Davis et al., evidentials are capable of manipulating the value of c_τ, allowing the speaker

to make assertions at variable quality threshold values that can be either lower or higher than the default value of c_τ. The new value assigned to the context is no longer that of c_τ but $\mu_c(\mathbf{ev})$, the evidential context threshold. This process is given in (220).

(220) Let φ_{ev} be the proposition that a situation in which an agent obtains **ev**-type evidence for p is also a situation in which p is true. μ maps context-morpheme pairs to probabilities:

$$\mu_c(\mathbf{ev}) = \mathbf{P}_c(\varphi_{ev})$$

(Davis et al. 2007: 9-10)

The above states that when there is a context in which a speaker has some type of evidence for a proposition, the probability given by the evidential ($\mu_c(\mathbf{ev})$), changes the value of the context threshold to a value at which the speaker can then assert the proposition ($\mathbf{P}_c(\varphi_{ev})$). The difference between evidentials and modals for Davis et al., is that modals such as *must*, according to Davis et al., are unable to manipulate the context threshold. Thus modals always assert under the value of the context threshold.

Change of context and context threshold occurs with all evidentials, regardless of the evidence type, be it hearsay or direct witnessing. Associated probabilities can also vary depending on evidence type and the evidence in a particular context. For example, hearsay evidence from a flaky friend would be considered rather worthless in terms of its evidentiary value. Hearsay can be considered an ultimate authority on the matter of truth, such as when children cite their parents, such as *Mom says X!* (Davis et al. 2007: 10).[65] Thus in one case $\mu_c(\mathbf{ev})$ may be lower than c_τ and in another case, $\mu_c(\mathbf{ev})$ may be higher than c_τ for the same evidence source type.

For Davis et al., all evidential declarative utterances are felicitous assertions, as they manipulate the context threshold to a value to one which the evidential probability value exceeds (or is equivalent to); the authors illustrate this process in Figure 2.11. How this

[65] I discuss the variable nature of hearsay evidence in Section 4.5.3.

change occurs, in terms of the ordering between the utterance of the evidential and the change in contextual-probability is not made clear in the Davis et al. account.

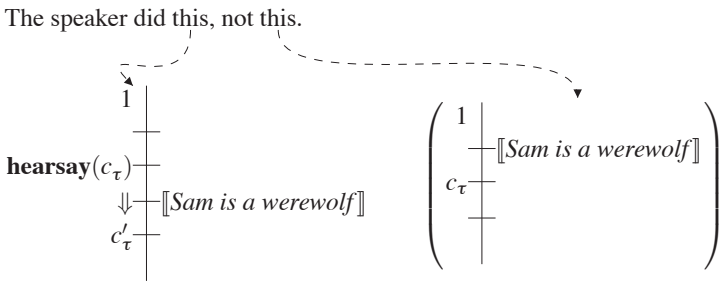

Figure 2.11: Davis et al.'s (2007) Manipulation of c_τ with S[**ev**]

(Davis, Potts & Speas 2007: 13)

Davis et al. are not explicit in the mechanics of the process which is pictured above. The order of the change from c_τ to $\mu_c(\mathbf{ev})$ and timing with respect to the evidential utterance (i.e., does the speaker use the evidential and then the context changes, or does the context change to an evidential context prior to the utterance with the evidential?), is not discussed in their proposal.

Issues for Davis et al.'s model of the evidence signal

Similar to McCready & Ogata's 2007 analysis is how one determines the probability values of evidentials, how $\mu_c(\mathbf{ev})$ is derived in case by case basis. It is not clear if evidence types can have a probability range, or they are always specific. This leads us to another issue. What informs the probability that associated with $\mu_c(\mathbf{ev})$, whether it is given by the evidence source type or the evidential utterance, is not clear from (216) or (220). In the case of good hearsay evidence, one does not always use the REPORTATIVE evidential but rather the DIRECT. An example of this comes from Cuzco Quechua (Faller 2002), and is provided in (221). In this example, the speaker has only one evidence source type: hearsay. Depending on how reliable the speaker judges Inés to be, the speaker can relay the proposition two

ways: with either the DIRECT evidential *-mi* or the REPORTATIVE evidential *-si*. I refer to the phenomenon this case as EVIDENCE PROMOTION.

(221) EVIDENCE PROMOTION: HEARSAY TO DIRECT

(a) INÉS IS RELIABLE

Paqarin	*Inés-qa*	*Qusqu-ta-**n***	*ri-nqa*
Tomorrow	Inés-TOP	Cuzco-ACC-DIR	go-3FUT

'Inés will go to Cuzco tomorrow [direct].'

(b) INÉS IS NOT RELIABLE

Paqarin	*Inés-qa*	*Qusqu-ta-**s***	*ri-nqa*
Tomorrow	Inés-TOP	Cuzco-ACC-REP	go-3FUT

'Inés will go to Cuzco tomorrow [hearsay].'

(Faller 2002: 96)

If it were the case that the speaker were restricted to only uttering the evidential which reflected the evidence source type he has for the proposition, then he would only be licensed to use the reportative evidential *-si* in both cases; it would not matter how reliable Inés is. The evidential a speaker may use in this instance, however, is not limited by the evidence source type he has for the proposition. This use of the DIRECT evidential in the case of hearsay evidence should be infelicitous in Davis et al.'s model, as the speaker does not have *ev-type* of evidence for *p*. Perhaps it is the case that the speaker has evidence that is valued at a certain probability, and that probability aligns with the probability encoded by another evidential type. Davis et al.'s model is not set up as such that would allow such probability matching in this way; evidence sources align directly with evidential types, not probabilities given by evidence with the probabilities given by evidentials. There are some issues which prohibit the current proposal from being adopted as it is currently formulated without additional investigation into the relation between evidence sources, probability values and evidential expressions.

There are some aspects of Davis et al.'s analysis that are quite appealing, and thus one should not disregard their approach entirely. One very appealing aspect of the analysis is that it posits all evidentials perform the discourse function and rely on the evidence type to vary the value associated with the evidential utterance. Another appealing aspect of their approach is that the INFERENTIAL and CONJECTURAL evidentials types are not modeled as modal assertions in addition to evidential assertions (modals and evidentials perform separate discourse functions). Davis et al.'s proposal is also one of the few presented here in which evidential utterances are all semantically uniform (comprising a natural semantic class), varying only according to type. For Davis et al., REPORTATIVE evidentials perform the same speech acts as DIRECT evidentials. This uniformity of evidential speech acts eludes the analyses of Faller (2002), Murray (2010) and McCready & Ogata (2007), and supports the intuition of Matthewson et al. (2007) and the proposal given here.

2.3.6 Previous proposals: A summary

As we saw from the discussion above, very few analyses pay much attention to the evidence aspect of the evidential. For many, the evidence signal of the evidential is not formalized, but listed as a description as "evidence type" in the descriptive literature. These formal models seek to explain evidentials' effect on a discourse context, but assuming a simple description of the evidence signal expressed by the evidential, these analyses include some redundant functions, particularly in the case of inferential evidentials. Problems also arise for analyses of reportative evidentials which remove all sincerity conditions of belief for reportative evidentials. There are many cases where attempts to extend these analyses to more specific evidence scenarios become problematic, such as the cases in the Lost Keys, Gross Food or Shell Game scenarios. It seems that without further investigation into what is meant by evidence and more detailed descriptions of what evidence source type is, theories such as those discussed above, will continue to fall prey to those issues raised here.

Chapter 3

Formalizing a Notion of Evidence

Evidence rarely comes to us with already established credentials regarding its relevance, credibility and force.[1]

In the previous chapter I focused on indirect evidentiality, and Yup'ik and English evidentials in particular. In this chapter we take a broader view of evidentials and evidence types, particularly indirect evidentiality. The aim of this chapter is to render a more accurate description of evidentiality and evidence in general, in order to formalize a semantics of *evidence* for evidentials. By acquiring a deeper understanding of the nature of evidence in terms of evidentials, we can provide a more powerful and insightful model of the semantics and pragmatics of evidentials.

3.1 Typology of Evidentials and Evidence Source Types

The generally-accepted view of evidentials, in both the typological and formal literature, is the source-only interpretation of evidentials, or "narrow" interpretation of evidentials. The narrow interpretation of evidentials is that evidentials are expressions of the particular source-type the speaker has for a proposition. The following review of Aikhenvald (2004) illustrates the pervasiveness of this view.

> The most important result of A[ikhenvald]'s crosslinguistic study has to do with the notional definition of evidentiality. A demonstrates beyond all doubt that the

[1] Schum (1994: 67).

> narrow conception of evidentiality in terms of the notion of 'source of information' is linguistically highly relevant. In other words, evidentiality defined narrowly as the indication of source of information is a linguistic notional domain, or 'category', 'in its own right'. The main argument for this consists in the many examples of narrow grammatical evidential paradigms, that is, morphosyntactically delimited systems of two or more grammatical items, the primary meanings of which can all be described as specifications of source of information.
>
> (Van Der Auwera & Boye 2008)

While the narrow source definition of evidentials is the generally-accepted view of the evidential expression in the literature, it is not the only view. Others argue for a broad definition of evidentials; that the evidential also expresses other information, such as reliability of an evidence source (Chafe & Nichols 1986; Rooryck 2001), or probability, precision and expectation (Mithun 1986). In the formal semantic literature, inferential evidentials are the locus of the intersection of evidentiality and modality, as the inferential evidential expresses belief or certainty (Faller 2002; Matthewson 2007; Izvorksi 1997; Murray 2010). Inferential evidentials have been modeled as expressing a modal or probabilistic component in addition to their evidence source expression (McCready & Ogata 2007; Matthewson et al. 2007; Murray 2010; Izvorski 1997).

There is no model of the semantics of evidentials which does not specify an evidence source type; the narrow view is very much at the heart of any formal semantic analysis of evidentials. The source type description exists at the most basic level of nearly every formal semantic definition given for the expression of the evidential content (section 2.3). Almost every semantic approach to evidentials seems to accept this particular aspect of the evidential signal to not warrant further investigation.[2] I provide a handful of examples

[2]Only Faller (2002), whose sincerity conditions are not specific to source (see section 2.3.1), discusses how the evidence, the proposition and the speaker relate.

of the formulation of the evidential signal which span over a decade of formal analyses of evidentials in formal semantics.

(222) Sample formal definitions of evidential content

(a) *Izvorki 1997*

Assertion: □p *in view of the speaker's knowledge state*

Presupposition: *Speaker has indirect evidence for p*

(Izvorski 1997: 5)

(b) *Davis et al. 2007*

Uttering S[**ev**] commits the speaker to the existence of the situation in which he receives **ev**-type evidence for [[S]].

(Davis et al. 2007: 7)

(c) *McCready & Ogata 2007*

$\mathbf{E}^i_a\varphi$ Indicates that φ is evidence acquired by i means by agent a

$\mathbf{H}_a\varphi$ Indicates that a has experienced an event of acquiring hearsay knowledge φ, at some past time.

(McCready & Ogata 2007: 184; 187)

(d) *Murray 2010*

i. Direct

The speaker i is certain (based on personal experience) of the proposition p that Floyd won.

ii. Conjectural (Assumed)

The speaker [i] has conjectural evidence for the at-issue proposition p .

iii. REPORTATIVE/HEARSAY

The speaker i heard the at-issue proposition p.

(Murray 2010: 96; 100; 97)

The descriptions of evidentials above assume much about the nature of evidence, but do not provide a description or model of *evidence*. It seems that most assume, that what counts as evidence can be easily determined by real-world knowledge, but discussion in the previous chapter, and in this chapter as well, illustrates that categorization of evidence and source type is not as straightforward as these analyses assume it to be. Perhaps a more complete view of evidence and evidential types may afford a better way to capture the semantics of evidence expressed by evidentials.

3.1.1 AIKHENVALD'S (2004) TYPOLOGICAL EVIDENTIAL SYSTEM CATEGORIZATION

Evidence source types that are expressed by evidentials are varied, but there seems to be an upper limit to the number of types expressed by evidentials. Languages with evidential systems vary with respect to the number of evidentials and the types of evidence sources that these evidentials encode. Aikhenvald (2004) provides a typological survey of evidentiality, and is perhaps the most comprehensive cross-linguistic study of evidentials to date. Aikhenvald categorizes with an alphanumeric coding system based on two criteria: (i) the number of evidence types that are morphologically expressed, and (ii) the particular source types within that system. In Aikhenvald's system, the letters *A*-*D* indicate the number of distinct morphological evidentials in a language, where an *A*-type evidential system has the fewest evidence distinctions, and a *D*-type has the most. These types are then further subdivided, and are given a number from *1-5*. It is important to note that there is no correlation of the numbers across types. For example, the *1* in an *A1* language has no relation to the *1* in a *C1* language. Aikhenvald's system distinguishes only within each of the basic types. For example, a *B1* system is a 3-evidential system that has DIRECT (VISUAL), INFERENTIAL and REPORTED evidentials, as opposed to a *B3* system, which has VISUAL, NON-VISUAL

SENSORY and REPORTED evidentials. In Table 3.1, the following shorthand is employed: (V) indicates 'visual', (NV) indicates 'non-visual', (A) indicates 'Auditory', (H) indicates 'hearsay', and (NH) indicates 'non-hearsay'.

System Type	Subdivisions and Evidence Sources Types				
A	**1** Firsthand Non-firsthand	**2** Non-firsthand 'everything else'	**3** Reported (H) 'everything else'	**4** Sensory Reported (H)	**5** Auditory (NH) 'everything else'
B	**1** Direct (V) Inferred Reported	**2** Visual Sensory (NV) Inferred	**3** Visual Sensory (NV) Reported	**4** Inferred Sensory (NV) Reported	**5** Reported Quotative 'everything else'
C	**1** Visual Sensory (NV) Inferred Reported	**2** Direct (V) Inferred Assumed Reported	**3** Direct Inferred Reported Quotative		
D	**1** Visual Sensory (A) Inferred Assumed Reported				

Table 3.1: Aikhenvald's (2004) Typology of Evidentials

Let us first discuss Aikhenvald's categorization of evidentials first, and then where Yup'ik or English fit within her typology.

The "Everything Else" Category and Defaults

Aikhenvald lists among the evidential types an 'everything else' category, which she considers to be a default category and not an evidential one. This issue is relevant for Yup'ik and English, as it is not clear how we best categorize simple declaratives in terms of evidentiality. Murray (2010), contrary to Aikhenvald, considers the -∅ morpheme of declaratives in Cheyenne to be a DIRECT evidential, Papafragou, Li, Choi & Han (2005) consider the Korean declarative marker *-e* to be a DIRECT evidential, and finally Ozturk & Papafragou (2007, 2008) and Papafragou & Ozturk (2007) assume that the Turkish indicative past tense morpheme *-dI* to be a DIRECT evidential as well, although morphemes such as Korean *(*-e) and Turkish *-dI* are not completely exclusive to situations where the speaker has direct evidence. For example, according to Asku-Koç & Slobin (1986, 1988), *-dI* can also be used to mark propositions that express encyclopedic knowledge or those known facts whose source is unspecified.

Analyzing the default or unmarked form as a DIRECT evidential has cross-linguistic implications that may be undesirable, particularly for languages with optional evidentials. For example, in Cuzco Quechua, propositions can either be unmarked with respect to evidence, or overtly marked with the DIRECT evidential morpheme *-mi* (Faller 2002). The non-evidential utterance is considered by Faller (2002: 43) to carry the force of an assertion with no "extra" assertive force, whereas with the DIRECT evidential *-mi* is an assertion with additional force. The extra force associated with the DIRECT is given by the sincerity condition that the speaker has *best possible grounds* (*Bpg*).

(223) Two Ways to Assert(p): *Cuzco Quechua*

(a) unmarked/no evidential	(b) direct evidential
Para-sha-n	*Para-sha-n-**mi***
rain-prog-3	rain-prog-3-dir
p=‘It is raining’	p=‘It is raining’
ill = assert(p)	ill = assert(p)
sinc = {Bel(s,p)}	sinc = {Bel(s,p), Bpg(s,p)}
	strength = +1

(Faller 2002: 43)

If we were to consider the unmarked form a direct evidential, then Faller would have to argue that Cuzco Quechua has two direct evidentials, a null evidential (-∅ morpheme) and phonologically overt direct evidential *-mi*. Faller does not argue this to be the case. It is not clear that a default category such as a declarative marker should be considered equivalent to a direct evidential, or simply carry the (conversational) implicature that a speaker has direct evidence.

A-type Evidential Systems

An *A*-type evidential system makes two evidence source distinctions, often only marking one evidence source distinctly, and all other types are indistinct, expressed by a default morpheme. Turkish is an example of an *A2* system,[3] only *-mIş* is used to mark propositions learned by either inference or hearsay, and the indicative past tense *-dI* mostly associates with direct evidence, but can also be used to mark encyclopedic knowledge or other known facts. In the example below, the use of the morpheme *-mIş*, indicates that the speaker has indirect evidence for the proposition *Ahmet came*, such as seeing his coat on the rack. The morpheme *-dI* implies that the speaker has actually seen Ahmet himself.

[3]If we consider *-dI* as default and not direct as Aikhenvald does.

(224) A2 System: *Turkish*

(a) Indirect

*Amet gel-**miş***

Amet came-mIş

'Amet came/must have come.'

(b) 'Everything Else'

*Amet gel-**di***

Amet came-dI

'Amet came [I saw him].'

(Aksu-Koç & Slobin, 1986: 159)

B-type Evidential Systems

B-type evidential systems mark three evidential distinctions. Cuzco Quechua is an example of a *B1* system, as it has three morphological evidentials: the direct *-mi*, the conjectural (inferential) *-chá* and the reportative/hearsay *-si*. As mentioned, Faller claims that evidential morphemes can be optional, and the unmarked form is considered non-evidential.

(225) B1 System: *Cuzco Quechua*

(a) Visual (Direct)

*Para-sha-n-**mi***

rain-prog-3-dir

p ='It is raining.'

ev = speaker sees that p

(b) Conjectural (Inference)

*Para-sha-n-**chá***

rain-PROG-3-CNJ

p ='It is raining.'

EV = speaker conjectures that p

(c) Reported (Hearsay)

*Para-sha-n-**si***

rain-PROG-3-REP

p ='It is raining.'

EV = speaker was told that p

(Faller 2002: 3)

C-type Evidential Systems

C-type evidential systems mark a four-way evidential distinction. An example of a *C1* system is Eastern Pomo (Pomoan: McLendon 2003: 101-2, cf. Aikhenvald 2004: 52-3), which has four evidential morphemes: the VISUAL evidential *-ámi*, the NON-VISUAL/AUDITORY evidential *-ásĩ*, the INFERENTIAL evidential *-ápĩ*, and the REPORTATIVE/HEARSAY evidential *-ápɨˈ*

(226) C1 System: *Eastern Pomo*

(a) Visual (Direct)

diâyɨ	*waˈî̂-re*	*yaha-**ámi***
dog	fish-TOP.NON.A/S	steal REC.P.VIS.3sgnf

'The dog stole the fish' (I saw it)

(b) Sensory (Nonvisual)

diâyɨ	*waˈî̂-re*	*yaha-**ásĩ***
dog	fish-TOP.NON.A/S	steal REC.P.NONVIS.3sgnf

'The dog stole the fish' (I heard the noise)

(c) Inferred

diâyɨ *waˈî-re* *yaha-**ápĩ***

dog fish-top.non.a/s steal rec.p.infr.3sgnf

'The dog stole the fish' (I inferred it)

(d) Reported (Hearsay)

diâyɨ *waˈî-re* *yaha-**ápɨˈ***

dog fish-top.non.a/s steal rec.p.rep.3sgnf

'The dog stole the fish' (I heard it from someone else)

(McLendon 2003: 101-2, cf. Aikhenvald 2004: 52-3)

D-type Evidential Systems

D-type evidential systems, have only one subtype, in which there are five distinct evidential morphemes. It's not clear how many D-type evidential systems there are, as Aikhenvald only notes the number to be "few" (2004: 60). An example of a *D1* system is Tuyuca (Barnes 1984, cf. Faller 2002: 42-43) in (227).[4] Tuyuca has five evidential morphemes, the visual *-wi*, the nonvisual/auditory *-ti*, the apparent (inferential) *-yi*, the reportative/secondhand *-yigi*, and the assumed (inferential) *hĩgi*.

(227) D1 System: *Tuyuca*

(a) Visual

*dɨ́ɨga apé-**wi***

'He played soccer.'

(I saw him play.)

[4]As noted in Faller (2002: 42, fn. 4), there are no morpheme-by-morpheme glosses available for Barnes' Tuyuca example.

(b) NONVISUAL

*dűga apé-**ti***

'He played soccer.'

(I heard the game and him, but didn't see it or him.)

(c) APPARENT (INFERRED)

*dűga apé-**yi***

'He played soccer.'

(I have seen evidence that he played: his distinctive shoe print on the playing field. But I did not see him play.)

(d) SECONDHAND (REPORTED)

*dűga apé-**yigi***

'He played soccer.'

(I obtained the information from someone else.)

(e) ASSUMED

*dűga apé-**hĩgi***

'He played soccer.'

(It is reasonable to assume that he did.)

(Barnes 1984:257f., cf. Faller 2002: 42-43)

The distribution of evidential categories across languages and evidential systems varies quite substantially. As the number of evidential distinctions increases, the variation of different types encoded decreases.

One issue of which we should be aware, is what seems to be a lack of cross-linguistic standards for categorization and classification of an expression as 'evidential' and the types of evidentials linguistically expressed. In terms of classification within Aikhenvald's typology, the categorization of the default as DIRECT evidential affects the system label, which undermines the goal of such a typology. For example, Central Yup'ik Eskimo could be categorized

as either a *B1* or an *A4* system, depending on how one labels the bare indicative past tense (and the SENSORY evidential in *A4*). If we choose to label the plain indicative past tense as DIRECT, like Murray (2010) does for Cheyenne, then Yup'ik could be considered a *B1* system, having three evidentials. If we choose to label the bare indicative as 'everything else' (and thus non-evidential), then Yup'ik is a *A4* system, having two evidentials. In some languages, such as Tuyuca, evidentials are obligatory, and thus there is no such thing as an unmarked assertion (Aikhenvald 2004). As mentioned above, Aikhenvald (2004) explicitly specifies that simple assertions are non-evidential, but only carry an implication that the speaker has direct evidence. It may not be fair, however, to make statements based on languages with obligatory evidentials about those in which evidentials are optional. In the case that all evidentials are obligatory, it is not clear if there are cases of unmarked assertions. Further investigation into the relation of DIRECT evidential and simple assertions cross-linguistically may prove to yield more insight into this matter.

Classification of Yup'ik and English Evidential Systems

We do find, however, that the types of evidentials found in Yup'ik and English do not seem to fit into Aikhenvald's typological categories given in Table 3.1, if we do not claim that the unmarked assertion is a VISUAL/DIRECT evidential. A summary of evidential types in English and Yup'ik is provided in Table 3.2.

Language	Expression	Evidential Type
Yup'ik	*-llini-*	Apparent (Inferred)
	=gguq	Reportative/Hearsay
	∅	'everything else' (direct)
English	*apparently, evidently*; *clearly, obviously**	Apparent/Inferred
	reportedly, supposedly	Reportative/Hearsay
	according (to X)	Quotative
	*presumably***	Assumed
	∅	'everything else' (direct)

*With additional constraints on the discourse context.

**Expression not thoroughly compared with Yup'ik (no assumed).

Table 3.2: Yup'ik and English Evidentials and Types

English in particular does not fit any of the above system classifications if we do not consider simple assertions to be phonologically null direct evidential morphemes, or perhaps if we are incorrect in considering *presumably* an assumed evidential. The latter option is a viable possibility, as *presumably* was not directly compared to Yup'ik (there is no assumed evidential in Yup'ik). If the former option is the case, however, then English is an example of a *D1* evidential system, the same classification as Tuyuca (Barnes 1984) and Tariana (Aikhenvald 2004), a very select group.

Language	Evidential Types	[Aikhenvaldian] System Classification
Yup'ik	Apparent/Inferred Reportative/Hearsay 'everything else' (direct)	*A4* or *B1* (if Direct)
English	Apparent/Inferred Reportative/Hearsay Quotative Assumed 'everything else' (direct)	*C3* or *D1* (if direct)

Table 3.3: Yup'ik and English Evidentials and System Classification

In terms of the evidential types that exist, we must rely on what has been gathered from the reports of descriptive linguists and evidential use is taken at face value. The goals in descriptive linguistics differ from those of formal semantics. This is not to say that one is necessarily better than the other, simply different. The focus in the descriptive literature is to accurately and fully describe a language, where the goals of formal semantics to accurately describe and model a phenomenon in Language. The issue with using description alone to inform semantic theory of evidentials was addressed by Faller (2002), who discarded the previous label of visual/witnessed (Weber 1986) for the Cuzco Quechua evidential *-mi* in favor of the label direct, as *-mi* is not limited to visual evidence alone. Much of the data that is available, then, is subject to researchers' labels, definitions, descriptions and categorization. Often what appears at first glance to be characterized by a simple description, proves to be more complex when we put evidentials in more types of contexts than what is normally offered in the descriptive literature.

3.2 Limitations of Evidence Source Type Definitions

We saw in the previous chapter that one issue with the evidence source type approach were descriptions given for the evidence signals of the APPARENT and the ASSUMED as the presence of observable evidence, such as Willet's (1988) and Barnes' (1984) below.

(228) Willet's (1988) Apparent and Assumed

(a) Inference from Results (Apparent):
The speaker infers the situation described from *observable evidence*
(i.e., from perception of the results of the causing event or action.)

(b) Inference from Reasoning (Assumed):
The speaker infers the situation described on the basis of intuition,
logic, a dream, previous experience, or some other *mental construct*

(229) Barnes' (1984) Apparent and Assumed

(a) An APPARENT evidential is used when the speaker draws conclusions from direct evidence.[5] (1984: 260).

(b) An ASSUMED evidential is used when the speaker has prior knowledge about the state of things or about habitually general behavior patterns. (1984: 262)

There are cases where there is "observable evidence", but not observable evidence that can be expressed with the APPARENT. Two example scenarios are repeated below, the Lost Keys (230a) and the Shell Game (230b) scenarios. In both cases, the speaker employs some type of deductive or eliminative reasoning, and is unable to express their inference marked with certain evidentials. A summary and brief description of the evidence scenarios discussed here is provided in (230).

[5]Barnes' "direct evidence" above is not direct evidence in same way as sensory evidentials, or visual witnessing evidence, but observable result of an event.

(230) Problem Cases for the Apparent/Assumed Classification

(a) Lost Keys (*Yupik, English*)

Context: Suppose you have lost your car keys. You have looked everywhere in your house, high and low, and they are nowhere to be found. Given you cannot find them anywhere that you have looked. You decide that they are in your car. Standing in your living room, you say:

i. # *Kelucanka nunakuarcuute-mi uita-**llini**-ut*

keys car-rel.3sg be-inf-abs.3pl

'Evidently the keys are in my car.'

ii. # Apparently/Evidently my keys are in my car.

(b) Shell Game (St'át'imcets *lákw7a*)

Context: I show you a coin and three small cups. I put the coin under one of the cups and then I mix them around and around very fast so you can't see any more which one it's under. I ask you to guess. You guess one cup, and I lift it up and show you that it's not under there. You guess a second one, the same.

You point to the last cup and say:

# *láti7*	***lákw7a***	*lh=as*	*legw*
there	sense	comp=3sbjn	hide

'It must be under that one.'

(Volunteered with inferential *k'a* (assumed).'

(Matthewson (2011: 19)

The above examples are not the only cases where the source-type description of evidentials fall short in terms of accounting for the data we see. The way in which Aikhenvald and other researchers categorize evidentials as expressing a particular source type suggests that that there is a simple, direct one to one mapping between source and evidential. This

is not the case, as it is not uncommon for multiple evidence sources to be reflected by a singular evidential, or that a certain evidence type does not always align to what should be its corresponding evidential. I discuss such cases below.

3.2.1 Evidence-Evidential Mismatch

The following cases illustrate instances where a speaker has a particular evidence source type for a proposition, but expresses this proposition with an evidential that is not reflective of the source type he has.

"Direct" Hearsay: Evidence Promotion

One example of evidence source type and evidential mismatch are cases of Evidence Promotion, where a speaker uses an evidential with an "incorrect" evidence source. An example from Cuzco Quechua (Faller 2002) illustrates this phenomenon. Relevant for the current example are the direct and reportative (hearsay) evidentials *-mi* and *-si*. The direct evidential *-mi* marks propositions for which the speaker has direct evidence, such as visual or witnessing evidence, but is not limited to only visual evidence, as it can also encode encyclopedic facts.[6] The reportative evidential *-si* is used almost exclusively to express that the speaker has heard a previous assertion of the proposition.

The motivating case is that which is given in (231). The speaker has only one evidence source type, hearsay, but he may use either the either the direct evidential or the reportative evidential to relay the proposition learned by hearsay. In this case, the source of the assertion, and the subject of the assertion are the same person, Inés. According to Faller, the evidential the speaker uses to report Inés' assertion depends upon how reliable the speaker judges Inés to be. If Inés is reliable, the speaker marks the proposition with the direct, and if she is unreliable, the speaker marks the proposition with reportative.

[6] In cases where visual evidence is unavailable, such as predicates of taste. To know how something tastes, one needs to actually taste it. Here, taste is the evidence type associated with the direct but is not visual witnessing evidence.

(231) Evidence Promotion: Hearsay to Direct

(a) Inés is reliable

Paqarin	*Inés-qa*	*Qusqu-ta-**n***	*ri-nqa*
Tomorrow	Inés-top	Cuzco-acc-dir	go-3fut

'Inés will go to Cuzco tomorrow [direct].'

(b) Inés is not reliable

Paqarin	*Inés-qa*	*Qusqu-ta-**s***	*ri-nqa*
Tomorrow	Inés-top	Cuzco-acc-rep	go-3fut

'Inés will go to Cuzco tomorrow [hearsay].'

(Faller 2002: 96)

We also see this alternation with English *reported/supposedly* and the English declarative. We see that in this particular scenario, where the original speaker and the subject of the proposition are the same, the quotative evidential *according (to X)* is highly marked, if not infelicitous.[7]

(232) Context: Anna has told you that she will be in Chicago tomorrow and cannot come to the party. Someone at the party asks where Anna is, and you answer:[8]

(a) Anna is reliable

i. Anna is in New York.

ii. # Supposedly/Reportedly Anna is in New York.

iii. # According to Anna, Anna is in New York

(b) Anna is not reliable

i. # Anna is in New York.

ii. Supposedly/Reportedly Anna is in New York.

[7]Evidence promotion exists in Yup'ik, but is slightly different. I discuss this in section 4.2.3.

[8]Note both mentions of "Anna" in this case are the same referent. It is not the case that there is one "Anna" saying something about another "Anna".

iii. ? According to Anna, Anna is in New York

If it were the case that the speaker were restricted to marking the proposition with the evidential that reflected the source type he has for the proposition, then he would only be licensed to use the REPORTATIVE evidential in both the reliable and unreliable cases. This is not the case; the evidential a speaker may use in this type of instance is not limited by the evidence source type he has for the proposition. The phenomenon of evidence promotion exists across evidential systems, and with hearsay evidence in particular (Krawczyk 2009; 2010). Cases such as evidence promotion motivate the need for further investigation into the process of evaluation of evidence.

This example suggests that the speaker's evaluation of his evidence is a multi-step process: he (i) determines the value of his evidence with respect to the proposition, and then (ii) selects the evidential that corresponds to his determined value. The Inés example illustrates an instance where Faller's strategy to shift her analysis of the DIRECT away from an evidence source type description of having visual or direct evidence, to that of having *best possible grounds* is descriptive of the facts we see above. Faller does not offer an explanation for how one determines that he has *best possible grounds* for a proposition. The analysis presented here expands upon Faller's intuition and proposes a model of this aspect of the evidential.

MIRATIVITY: EVIDENCE "DEMOTION"

MIRATIVITY is defined as the grammatical marking of speaker surprise, unexpected new information (DeLancey 1997, 2001) or unprepared mind (Aksu-Koç & Slobin 1986). Mirativity can be expressed through indirect/inferential evidentials, and the relation between mirativity and evidentiality has been a subject of some debate (DeLancey 1997, 2001; Dickinson 2000; Peterson 2010; Flaten 2009). According to DeLancey (2001), the particle *lõ* in Hare[9] (Athapaskan: Northwest Territories) is a non-evidential mirative particle. Hare does not seem to have an evidential system, and thus according to DeLancey, those uses of *lõ*

[9]Hare is a dialect of Slavey, also referred to as Dene.

are not "those of a true evidential." The felicitous use of *lõ* is not determined by whether the speaker has indirect evidence, but whether he has not only "indirect perception but the sudden (direct) perception of an unexpected fact." (2001: 376)

(233) MIRATIVE: *Hare*

ewé'	*ghálayĩda*	*lõ*
	work/2s	subj/IMPF

'I see you're working on hides!'

(DeLancey 2001: 376)

In other words, *lõ* seems to be limited to those cases where the speaker visually witnesses something surprising and unexpected, or according to one of DeLancey's Hare consultants, "*lõ* is there because you didn't know." (DeLancey 2001: 277)

DeLancey tested the evidential nature of *lõ* by comparing it to the indirect evidential in Lhasa Tibetan. Delancey argues that *lõ* is not a typical evidential particle because "the first examples that I found in connected texts could not be interpreted as inferential or hearsay," (2001: 376) and further testing of the evidential nature of Hare *lõ* illustrated that its behavior was divergent from the indirect evidential expressions in Lhasa Tibetan. This conclusion of DeLancey's, however, may not be correct. Recall that there are two types of inferential evidentials, the ASSUMED and the APPARENT. ASSUMED evidentials, such as Cuzco Quechua, can never take on a mirative interpretation (Faller 2002). It appears that indirect evidentiality in Lhasa Tibetan exhibits behavior which resembles the ASSUMED type of inferential evidential and not the APPARENT from the example in Garrett (2001).[10]

[10]Evidentiality in Lhasa is very complex and is expressed through different forms depending on the construction, whether it be copular, ELPA (Existential/Locative/Possesive/Attributive), or other (Garrett 2001).

(234) Lhasa Indirect Evidentiality

de.ring	*'dir*	*mchod.chang*	*spro.bo*	*zhe.drag*	***yod.red***
today	here	wine	tasty	very	[ind ELPA]

'The wine here today is very delicious [I've been told; I assume]'

(Garrett 2001: 39)

If it is the case that Lhasa Tibetan inferential evidentiality is of the ASSUMED type, then DeLancey's argument that *lõ* is non-evidential may not be valid. In fact, DeLancey (2001) also claims that the particle *lõ* in Hare bears a "striking resemblance" to Turkish *-mIs*, which is taken to be an inferential of the APPARENT type (Aksu-Koç & Slobin 1986; Izvoski 1997). In this case, DeLancey's conclusion that *lõ* is not an inferential evidential may be incorrect.

In languages with evidentials, however, the inferential (APPARENT) evidential is used to express mirativity. In the mirative case, a speaker has direct evidence, but relays the proposition with inferential evidential, reflecting a "demotion" of direct evidence to indirect. In the example below, the Yup'ik indirect evidential *-llini-* can give rise to two readings depending on the context of utterance: (235a) a normal evidential reading, or (235b) a mirative reading.[11]

(235) Two Readings of the Inferential Evidential

*ekua-lria-rtangqer-**llini**-uq*

fire-PART-for.there.to.be-INF-IND.3sg

'Evidently there's a fire.'

(a) Evidential Context:

The speaker feels heat or sees smoke, but not the fire itself (indirect evidence).

(b) Mirative Context:

The speaker actually sees the fire (direct evidence).

[11] Additionally the evidential can also have a metaphorical or sarcastic reading if the utterance in (235) is uttered in the context where people are moving in a very hurried fashion away from something where there is visibly *not* a fire. For more on evidentials and metaphorical interpretations, see Peterson (2010).

The mirative use of the indirect evidential is not restricted to Yup'ik, but can also be found in a number of other languages with evidentials, such as Gitksan (Peterson 2010), Turkish (Aksu-Koç & Slobin 1986; Aksu-Koç 1988), and Bulgarian (Izvorski 1997) and Georgian (Friedman 1986) perfects. What seems to concern linguists who investigate mirativity is the evidential to evidence source mismatch, that the speaker chooses to mark the proposition with an indirect inferential evidential in a context where he has direct evidence. In the case of direct evidence, such as visual witnessing, the speaker is expected to express the proposition with the "correct" DIRECT evidential (or simple indicative). As we see from the data above, a speaker's evidence source type and the evidential that they choose are not always congruent.

3.2.2 Evidence and Evidential Hierarchies

Evidential hierarchies are often provided for particular languages, yet prove to be problematic when applied cross-linguistically, particularly in the cases of indirect (e.g., inference, hearsay) evidence and evidentials (Faller 2002). Given examples of evidence source type and evidential mismatch, the speaker's evidential choice reflects a pre-determined strength-value for an evidence type as it corresponds to an evidential. The fact that evidence sources can be evaluated in such a manner is an issue for the source type definition of evidentials, which suggests that evidence or evidentials come with pre-determined, fixed values of strength.

This strength value is not taken to reflect degrees of credence. Matthewson et al.'s (2007) analysis exemplifies the argument that evidentials express a default degree of credence, and variation only comes from the evidence source type: visual, sensory, inference from reasoning, inference from results or hearsay. This view is also held by Oswalt (1986: 43, cf. Faller 2002: 59), who argues that evidentials mark only those propositions in which the speaker is "certain".

> It might be noted that, despite the hierarchy, all propositions with the Kashaya evidentials are presented by the speaker as certain and true. However, the evi-

> dentials themselves are at the top of a continuing hierarchy of modals expressing increasing uncertainty on the part of the speaker. These include a Suppositional suffix ('I suppose that...'), a Speculative ('I wonder if...'), an Optative ('I hope or wish that...') and others.
>
> (Oswalt 1986:43)

Faller (2002) argues that there is a flaw with Oswalt's argument; that if evidentials reflect certainty, or those propositions known to be true, it is not clear why they are on a continuing hierarchy of modals, which express uncertainty.

Faller argues that the problem with evidential hierarchies is that they attempt to rank evidentials, because the argument is that variation of strength comes from variation of source type. The intuition is that evidence source types provide the ranking, and thus some evidence sources are considered better or stronger than others. For example, one who has witnessed an event is usually considered to have "better" evidence that the event took place than someone who has only seen the results of the event. In terms of evidence source types and evidentials which would be used to encode them, such as in Cuzco Quechua, a speaker in the former would use a DIRECT evidential and the speaker in the latter, a CONJECTURAL evidential. Faller argues that when a speaker uses one evidential, it conversationally implicates that he could not have used another (better) evidential, and that he did not have an evidence source which warranted a higher-ranked evidential. Faller argues that this implicature is derived by the EVIDENTIAL MAXIM (2002: 76), which is a combination of Gricean Quality and Quantity (Grice 1975: 45-46), as illustrated in Figure 3.1.

Maxim of Quantity		*Maxim of Quality*
Make your contribution as informative as is required (for the current purposes of the exchange)	+	Contribute only what you know to be true. Do not say false things. Do not say things for which you lack evidence

=

Evidential Maxim
Base what you say on the strongest evidence available to you

Figure 3.1: Faller's (2002) Evidential Maxim

Dividing hierarchies: Degrees of Inference and Handedness

If degree of strength is not equivalent to degree of belief or credence, then evidentials, or the evidence source they encode, must be ranked in a hierarchy according to an alternate standard. Faller (2002) proposes that the best way to represent the hierarchy of evidence source types is to first draw a distinction between evidence source, the non-linguistic concept, and the evidential, the linguistic expression. Ranking evidentials on a single linear hierarchy, however, proves to be problematic for evidence sources of the indirect type of evidentials, the reportatives (e.g., REPORTED, HEARSAY, SECONDHAND, QUOTATIVE) and inferentials (e.g., INFERRED, ASSUMED, APPARENT). For example, hearsay evidence is sometimes considered more indirect or weaker than inferential evidence. In some proposed hierarchies, reportative evidentials, such as a QUOTATIVE or REPORTATIVE/HEARSAY evidentials, are ranked the lowest. An example of such an ordering is Oswalt's (1986) proposed evidential hierarchy for Kashaya, where the QUOTATIVE is ranked lower than the INFERENTIAL.

(236) Evidential Hierarchy: *Kashaya* (Oswalt 1986)

Performative[12] > Factual-Visual > Auditory > Inferential > Quotative

(Oswalt 1986, cf. Faller 2002: 60)

[12]The PERFORMATIVE is a first-person evidential that is used at the beginning of a discourse, but then is replaced by the FACTUAL-VISUAL. De Haan (2001: 203-204) argues that the Kashaya PERFORMATIVE evidential is not a true evidential "because it is limited to first person subjects and it occurs only at the beginning of a conversation, after which it is replaced by the Factual-Visual evidential."

The evidential hierarchy given for Tuyuca by Barnes (1984) proposes an alternative ranking in terms of the indirect types of reportative and inferential evidentials. In Barnes' hierarchy, the (SECONDHAND) reportative evidential is not lowest-ranked, but the ASSUMED [inferential] evidential is.[13]

(237) EVIDENTIAL HIERARCHY: *Tuyuca* (Barnes 1984)

VISUAL > NONVISUAL >	APPARENT >	SECONDHAND > ASSUMED
(direct)	> (indirect)	> (absent)

(Barnes 1984)

Neither of these proposed rankings captures the variable strength of hearsay evidence; hearsay evidence can expressed with a DIRECT evidential (section 3.2.1, example (231)). Hearsay evidence can also be preferred to one's conjecture and thus the CONJECTURAL evidential (an example that supports Barnes' hierarchy). Faller's (2002) "Pedro's Hen" scenario, illustrates this type of case, where hearsay evidence is taken to be better than conjectural evidence (section 2.3.3). According to Faller, Pedro prefers the eyewitness report as an evidence source over his conjecture. The example is repeated in (238).

(238) TWO DIFFERENT CULPRITS: REPORT OVER CONJECTURE

(a) *Atuq-chá* *wallpa-y-ta* *apa-rqa-n*
fox=CNJ ben-1-ACC take-PAST1-3
'I concluded a fox took my hen.'

(b) *Ichaqa* *wasi* *masi-y* *riku-sqa*, *puma-**s*** *apa-n-man* *ka-rqa*
but house friend-1 see-SQA, puma-REP take-PAST-3-IRR be-PST-3
'But my neighbor (lit. 'house-friend') saw it [happen], and [he says] a puma took it.'

[13]In the case of indirect evidentials, Barnes argues that both evidentials indicate that a speaker was 'absent' [from the scene of the event], as opposed to expressing 'indirect' evidence.

(Faller 2002: 69)

Pedro's Hen and the Evidence Promotion (hearsay → DIRECT) example motivate Faller's move away from ranking evidentials on a single, linear hierarchy. Faller argues that the evidence types of hearsay and inference are actually not ranked with respect to each other because they reflect different types of evidential reasoning systems. Faller proposes that rather than a single, linear hierarchy of evidence, evidence should instead be ranked with respect to two separate hierarchies (or *clines*), based on the type of reasoning employed. One of Faller's hierarchies ranks evidence sources that involve reasoning or human cognition, the PERSONAL EVIDENCE CLINE. The other hierarchy, the MEDIATED EVIDENCE CLINE, ranks the number of intervening speakers, or handedness, of reportative evidence.

(239) FALLER'S EVIDENCE CLINES

(a) **Personal Evidence Cline**

PERFORMATIVE > VISUAL > AUDITORY > OTHER SENSORY > INFERENCE FROM RESULTS > REASONING > ASSUMPTION

(b) **The Mediated Evidence Cline**

DIRECT > SECONDHAND > THIRDHAND > HEARSAY/FOLKLORE

(Faller 2002: 70)

Faller's hierarchy renders inference and hearsay incomparable, as they are ranked on completely separate hierarchies. For example, inference from results evidence is evaluated on the personal evidence cline, where "direct-ness" of evidence in (239a) is "measured in terms of the amount of inference involved in reaching the conclusion conveyed by the utterance" (2002: 70) Hearsay evidence, however, is ranked on the mediated evidence cline (239b), where "directness is measured in numbers of intervening speakers" (2002: 70). Faller's idea of "directness", *Best possible grounds* (or *Bpg*), is inherently vague and able to encode those cases where the speaker has best possible grounds given by direct hearsay or visual.

It is not always the case that direct, first-hand reports are considered *Bpg*, and this may be problematic for Faller's proposed clines. The speaker can relay a first-hand report with either the DIRECT or REPORTATIVE in (231); and in the case that the speaker uses the REPORTATIVE to mark a first-hand report, then direct hearsay is not taken to be *Bpg*. Circumstances of the context that are independent of the handedness of the report seem to determine whether the speaker will use the DIRECT or REPORTATIVE evidential.

From the data, it seems that fixed clines of evidence or evidentials, as given by any of the proposed hierarchies, are too rigid to reflect how evidentials are actually used. Any ranking tacitly assumes that certain source types come with a pre-determined value, which is counter to Faller's own intuition about evidentials. For example, in the case of determining whether something is fuzzy or not, the most direct evidence type would be sensory, and it's not the case that visual or witnessing evidence is always best. Source-monitoring literature in child developmental psychology targets this type of reasoning. In Robinson & Whitcombe (2003), children were asked to identify a hidden toy, which varied in texture (fuzzy vs. hard/smooth) or color (red vs. blue).[14] Children's responses were compared with their adult pair's response. The child and the adult had only one mode of experience with the object, either 'see' or 'feel'; whichever mode of experience (evidence) that the child had with the object, the adult's was the inverse (e.g., if the child felt it, the adult saw it). The child was asked which toy he had based on his mode of experience, and was also informed of what the adult's (who had the alternative interaction type) response was at the time of reporting. Robinson & Whitcombe found that 3- and 4-year olds would change their response, and accept the adult's report on the color of the toy if the adult had visual evidence and the child only sensory in the color (red/blue) condition. In the case of the feel (fuzzy/smooth) condition, children did not change their responses, and did not accept the report of their adult pair, if they had felt the object and their adult pair had only seen it. In this case sensory evidence is better evidence than visual evidence, but no hierarchy given above can reflect this case.

[14]In Whitcombe & Robinson (2000), the general experimental design was the same for the two, but varied in additional questions concerning doubt, recall and suggestibility of children.

In order to reflect that in some cases non-visual sensory evidence is better than visual, any of the hierarchies given (including Faller's), must allow for ranking of evidence source types to be determined contextually. One may argue that Faller's *best possible grounds* in this case avoids the conundrum, but this is not the case. If *Bpg* is determined by the hierarchies given by Faller, then visual always outranks sensory; it's not the case that any hierarchy can be re-ranked with respect to non-visual sensory and visual in these cases. The hierarchies as proposed are not model how one determines that he has evidence that is *Bpg*. In fact, Faller (2002: 70) argues that the process of determining what is *Bpg* and what isn't, which is central to her discussion, is outside the purview of linguistics.

> . . . the speaker evaluates all evidence available to him or her, decides which proposition to believe in the case of conflicting information, and then chooses to mark the type of evidence that (s)he considers to be the strongest. The details of this evaluation process are very complex, and require further study, although probably not within the field of linguistics. Two things seem to play a decisive role. The first is the trustworthiness of the source in the case of reportative evidence, and strength of evidence in the case of inferential evidence, both of which might be said to be subsumed under Willett's criterion of reliability. The second is the subjective likelihood that the proposition is true.
>
> (Faller 2002: 70)

The data in this section illustrate that how evidence is evaluated and expressed by evidentials, however, is not outside the scope of linguistics. The source type description does not fully capture the behavior of evidentials, nor does *Bpg* paired with the evidential clines. These data seem to indicate that we must acquire a more specific understanding of what it means to be evidence, prior to giving an analysis of how evidence is expressed.

3.3 The Evidence Signal of Evidentials and Epistemology

If we take a bird's eye view of evidence and evidential types, we find that they do not seem to fit easily into a conceptual natural class. For example, some evidence source types directly refer to sensory perception, *vision* (sight), *audition* (hearing), *gustation* (taste), *olfaction* (smell), and *tactile stimulation* (touch).[15] Some of these senses have evidentials of their own, such as sight and touch, which are expressed with the VISUAL and AUDITORY evidential. Other "lower" sensory types fall under the umbrella of NV-SENSORY.[16] Some evidential types do not even refer to sensory types explicitly, but rather the inference that is provided by these senses, such as the inferential evidentials of the ASSUMED and APPARENT.[17] Lastly, there is the evidential type of hearsay, which is not linked to a particular sense or inference, but to the existence of a more abstract concept, a previously-asserted proposition.[18] In this sense, evidential labels seem to reflect two types of "evidence": (i) what we perceive and (ii) what we have inferred based on perception or knowledge.

3.3.1 The Problem of Perception

Epistemology is the philosophical study of knowledge. In epistemology, there are two approaches to the problem of perception, *Sense-Data Theory* and *Naïve* (or *Direct*) *Realism*.[19,20] Sense-data Theory was the predominant theory of perception throughout

[15]There are additional sensory modalities: *vestibular sense* referring to movement/balance, and *proprioception*, which is the "relative position of neighbouring parts of the body and strength of effort being employed in movement" (Glanze & Mosby: 1994: 1285).

[16]Recall that sometimes only auditory evidence can be expressed with NV-SENSORY, and others fall under an inferential APPARENT or ASSUMED heading.

[17]This categorization can also sometimes be reflected by the DIRECT, when the DIRECT marks inference from a sense or certain knowledge.

[18]We could try to categorize hearsay as a particular type of audition, but in languages with written orthography, hearsay includes those propositions which have been read, or asserted in written form.

[19]For other perceptual theories not discussed here, I refer the reader to Huemer (2011) or Bonjour (2011).

[20]The terms naïve and direct realism seem to be used interchangeably; from the literature, it seems that direct realism refers to the theory in epistemology, whereas naïve realism is a blanket term which is covers those theories from cognitive science to physics, that assume a direct realist-like view. The term *naïve realism* seems to suggest that those who take this hypothesis have not thought

the early 20^{th} century, whereas the theory of Direct Realism, as an approach to the epistemological problem of perception is more recent, although versions of naïve realism had been in existence for some time.[21]

According to Sense-Data Theory, that which we perceive is not the actual object itself, but a mental construct. Sense data are taken to have the following basic properties: (i) they are that which we perceive directly, (ii) they are dependent on the mind, and (iii) they have the properties that can appear to us perceptually (Huemer 2011).[22] Sense data are how objects in the external world appear to be; when one becomes aware of an object, he becomes aware that what is before him appears to him to be of an ovoid shape, small, and orange in color. Orange, ovoid, and small are properties that are perceptible, the inference that *This object that appears before me is a kumquat* is not perception; it is constructed from sense-data, but not part of the perceptual sense-data itself.[23]

The theory of Direct Realism eliminates the representation of the actual object as a mind-object. In some ways, direct realism is seen as a response to sense-data theory (Huemer 2011; BonJour 2011; Pollock & Cruz 1999). In Direct Realism, perception of the physical object and the physical object itself are not considered distinct, such that perception of the actual object occurs without representational intermediary or mental abstraction.

---

of some of the deeper issues surrounding perception, including what it is that can be objects of perception and the problem of justification, which plague epistemologists.

[21] An additional note to the reader: the hyphenated 'sense-data' refers to the theory, unhyphenated 'sense data' is simply sensory input, such as that from sight, smell, taste, feel or audition.

[22] Perception can be awareness that is either direct or indirect. An example of acquisition by indirect means is perceiving the amount of gasoline in the tank of a car. I cannot know the value of this amount directly (without removing the tank itself). My perception of the amount of gasoline in the tank is by way of my perception of the gas gauge first. Only by becoming aware of the gauge do I then become aware of the amount of gas in the tank. The perception of how much gasoline is in the tank may be incorrect, as the instrument of measurement could be broken. This is not to say that the perception of the gauge is incorrect.

[23] In Sense-data Theory, argues that what can be perceived is dependent on the mind. Perception in this case may be inaccurate, or not bear an accurate reflection of the actual object. If one were to take Sense-Data Theory to an extreme, two potential problems could arise. One is *phenomenalism*, that those objects which we take to appear before us may not actually exist in the actual physical world at all. The other is *skepticism*, or extreme solipsism, which is that our knowledge is limited to the self, and how and what the self perceives (Huemer 2011).

> . . . in most ordinary situations, it is material objects and situations that are the primary and usually the exclusive objects of the perceiver's explicit awareness and thought, with no hint that this awareness has been arrived at via any sort of transition from anything else. . . such objects and situations seem to be simply present in their own right in experience.
>
> (BonJour 2011: 23)

The majority of the literature on evidentials suggest that linguists tacitly assume a naïve (direct) realist approach to perception.[24] While we may at most times trust what we perceive to be the case, we are, on occasion, reminded that the mechanism of perception can be faulty.

3.3.2 Epistemological Theory and Evidentials

McCready (2010) also raises the issue of what evidence is in the case of evidentials, and investigates this issue from an epistemological perspective. McCready adopts the proposal of Williamson (2000), who argues that only propositional knowledge can be considered actual knowledge; all S's evidence is equivalent to all of S's knowledge, or $E{=}K$.[25] Williamson is careful to note that $E{=}K$ is not a definition of evidence, but rather an equivalence relation of the concepts of evidence and knowledge.[26] Perception data, Williamson argues, is not propositional, and thus is not knowledge. The following summarizes Williamson's proposal.

> . . . equates the extensions of the concepts *knowledge* and *evidence* in any possibly situation. . . By itself, E=K does not equate the concepts themselves; nor is it to be read as offering an analysis of either the concept of *evidence* or the concept of *knowledge*, or as making one concept prior to the other in any sense.

[24] The assumptions of the linguistic literature on evidentials do not stop at perception. The sensory object and how it relates to a belief update about another proposition are taken to be one and the same. An example of a place where this confound becomes truly problematic for a linguistic analysis is Peterson's (2010) proposal for the mirative, which I discuss in section 4.2.2.

[25] S can be an individual or a collective, Williamson (2000: 185).

[26] McCready (2008, 2010) assumes it to be a definition, of evidence, which is not quite accurate.

(Williamson 2000: 186 [italics in original])

Yet not all knowledge is evidence for a given hypothesis. Williamson models that which can be considered evidence as that knowledge which increases the probability of h more than simply that of h alone (240).

(240) Williamson's EV

e is evidence for h for S if and only if S's evidence includes e and $\mathrm{P}(h|e) > \mathrm{P}(h)$[27]

(Williamson 2000: 187)

Williamson's shorthand $E{=}K$ does not work both ways, as not all propositions in K are relevant to be considered evidence for h, but all propositions that are evidence for h must be in K. One can only use true, propositional knowledge as evidence, such that only inferences S makes in true, non-altered worlds are valid inferences from evidence. Williamson argues that in cases where S's evidence is false, he cannot be considered equally rational as if his evidence were true; it is not the case that false evidence can license a rational conclusion.

McCready (2008; 2010) takes Williamson's thesis and attempts to apply it to Japanese evidential modals, asking the question: do evidentials reflect evidence that is in the form of perception data or true, propositional knowledge? In order to answer the question whether non-factive mental states allow for felicitous uses of evidentials, McCready devises the following scenarios in which judgments are made based on faulty perceptual input: a "skeptical argument" and a Gettier-style (1963) scenario. I have summarized McCready's scenarios in (241).[28]

(241) McCready's (2010) False Evidence Scenarios

[27]Williamson claims that a consequence of EV is that e is evidence for h only if e is evidence for itself (2000: 187). According to Williamson, EV is concerned the "evidence-for relation", and thus on "the nature of the first relatum e of the evidence-for relation rather than its relation to the second relatum h" (2000: 189).

[28]Note: McCready does not provide data or particular examples, just discussion.

(a) *Gettier-style Scenario*

An agent Bob looks up to the hill and sees what he perceives to be a horse, and hears what he thinks to be a neigh. Bob is unaware that he is actually looking at a dead tree that is in the shape of a horse, and what he thinks to be a neigh is actually just the wind. In this case, there is actually a horse on the hill, behind the tree that looks like a horse (but Bob does not see that).

(b) *The Skeptical Argument*

An agent John has a dream in which he walks outside and finds that the streets are wet. He reasons then that it has rained, based on the wet streets. Soon after, John awakens to find that he was dreaming.

McCready reports that in the Gettier case (241a), Japanese speakers accept the use of the inferential evidential marking the proposition *There is a horse on the hill* by the Gettiered individual, Bob. According to McCready, native speakers consider Bob to have drawn a reasonable conclusion based on what he perceives. McCready's Japanese consultants report that the evidential is not felicitous from those observers who are distinctly aware that Bob is pointing to the tree and not to the actual horse. For the skeptical argument in (241b) McCready did not obtain clear results. McCready reports that native speakers did not accept the proposition *It rained* marked with an inferential evidential in the case of the skeptical argument, and often struggled with the scenario.

McCready concludes from these findings that the data validates Williamson's proposal that all evidence is knowledge ($E{=}K$), but that this knowledge is indexical to a judge. The latter point seems to be due to the fact that speakers seem to allow utterances of an evidential-marked proposition from a Gettiered individual, but not the others. This latter point is important, but it seems that McCready perhaps has misinterpreted Williamson's thesis slightly, or that he has constructed the test in such a way that it equivocates two factors. It is not clear that McCready's informants accept the utterance by the Gettiered

individual (Bob) because the proposition just happens to be true, or because speakers evaluate the evidential in terms of Bob's reasoning from his "evidence". If it is the latter case, and Bob's evidence is false, what Bob has is not propositional knowledge, but perception data, and thus McCready's interpretation is not correct.

When the Gettier scenario is tested in Yup'ik, we find the latter to be the case. When McCready's Gettier scenario is tested in Yup'ik for the indirect evidential *llini*, speakers seem to accept Bob's utterance as felicitous from Bob, not because it is true, but because they consider Bob reasoning process to be rational, based on what he thinks to be true.

(242) Gettier-Style Scenario: *Yup'ik*

*Kuunir-tangqe-**llini**-uq*	*peng-um*	*qai-ngani*
horse-be.now-INF.IND.2SG	hill-REL.3SG	top-LOC.3SG

'Evidently there is a horse on the hill.'

Speaker's Comment:

(a) *When asked if the above is acceptable from Bob*:
"Yes. He is describing what he sees as he knows it to be."

(b) *When asked if the above were acceptable if she knew Bob was pointing at the tree (and <u>not</u> the horse)*:
"If I knew it was a dead tree I would tell him what it was."

What the above illustrates is that speakers will accommodate the use of an evidential in the case that one's evidence is false but his conclusion based on his evidence is reasoned in a normal, reliable manner.[29] The value of this data is not entirely clear, as what aspect of

[29] Another scenario can be given to highlight the problems of perception and the agent of perception and evidentials. (Thanks to Angelika Kratzer for raising this issue.) Let's say Bob had experimental brain surgery that has left him prone to hallucination. Sometimes, by pure chance, the actual world and Bob's perception of the world align, but he doesn't know when this happens. Due to his condition, Bob always travels with his friend Fred, who constantly informs him of the state of the actual world. In the case where Bob relays a proposition using a direct or inferential evidential, the utterance is considered in felicitous– it is common ground that Bob's reasoning is faulty. In this case, speakers

the evidential and the reasoning processes are being evaluated by the native speakers is not obvious.

In terms of evidence and evidentials, it is not clear what we gain by adopting epistemological theory, nor does it seem that data from evidentials inform an epistemological thesis such as Williamson's. The application of a complex theory to evidential data does not seem to be a fruitful area of research for further understanding of the semantics of evidentials, but rather seem to only further obfuscate the issue of what is evidence. Rather than asking what evidence is in the existential sense, perhaps a direction that may be more informative is how evidence is generally modeled.

3.4 The Evidence Signal of Evidentials and Conditional Probabilities

Williamson's thesis concerns the epistemological relation of evidence and knowledge, but this is not his entire thesis. Since not all knowledge is relevant in terms of a particular hypothesis, he argues that the knowledge that can be considered evidence is that knowledge which increases the probability of a given hypothesis (repeated in (243)).

(243) Williamson's *EV*

e is evidence for h for S if and only if S's evidence includes e and $\mathrm{P}(h|e) > \mathrm{P}(h)$

(Williamson 2000: 187)

Conditional probabilities have been the predominant way to model evidence, to quantify the degree of certainty of a proposition given the inclusion of another (Hacking 1975, Schum 1994, Achinstein 2003). Most theories which investigate the contribution of evidence are concerned with those cases where the evidence supports a conclusion, but does not make it certain or entail its truth, such as those cases of indirect evidence.

> ...if this evidence is to any degree inconclusive, we are not entitled to say that this evidence entails the factual occurrence or truth of the event. Stated another

only accept the cases where Bob relays Fred's report, which is not a product of Bob's faulty reasoning processes (Lisa Matthewson, p.c., for St'át'imcets).

> way, *evidence about some event and the actual occurrence of this event are not the same*, and we may be misled if we take them to be... under a stipulation that all evidence is inconclusive to some degree, this inference can only be expressed in probabilistic terms.
>
> (Schum 1994: 18[Italics in the original.])

Perhaps the most common, or well-known conditional probability equation is Bayes' Theorem, given in (244). Bayes' theorem investigates the relationship between one conditional probability $Pr(e|h)$ and the inverse conditional probability $Pr(h|e)$.

(244) BAYES' THEOREM

$$Pr(h|e) = \frac{Pr(e|h)Pr(h)}{Pr(e)}$$

Table 3.4 I provides the definitions for each term in Bayes' theorem.[30]

Term	*Description*
$Pr(h\|e)$	The POSTERIOR PROBABILITY, or the conditional probability of h, given evidence e
$Pr(h)$	The PRIOR PROBABILITY of hypothesis h, or the initial probability of h before evidence e was included
$Pr(e\|h)$	The LIKELIHOOD, or CONDITIONAL PROBABILITY of e given h, or the degree to which h is predictable based on e, which is also argued to express the *inferential strength* of the evidence (Schum 1994: 49-50)
$Pr(e)$	The NORMALIZING CONSTANT, which ensures that the entire probability space sums to 1

Table 3.4: Bayesian Terms & Definitions

I provide a very simple example using Bayes' theorem to evaluate evidence in terms of conditional probability. Imagine a scenario where you and a friend see someone with short hair crossing the campus of a private high school. The uniforms at this school are rather

[30]Note: according to Schum (1994: 49-50), determining prior probability values is a source of controversy regarding this rule.

androgynous, both boys and girls wear the school polo shirt, navy sweater, brown shoes and khaki pants. The person you see has short hair and is wearing a baggy sweater. You want to ascertain how likely it is that this person who is walking across the campus is a girl (g), given that this person has short hair (e). Boys at this school are required to keep their hair short (100%), but only 10% of the girls keep their hair short. To simplify the arithmetic, let us assume that the school has 100 students, and is 60% girls and 40% boys.[31] The probabilities associated with the terms of Bayes' are given in (245).

(245) Saturation of Bayesian Terms: *A Girl* (g), *given Short Hair* (e)

$Pr(g)$	The prior probability of a student being a girl = 0.6
$Pr(e\|g)$	The likelihood that a girl will have short hair = 0.1
$Pr(e)$	The normalizing constant, that a person will have short hair = 0.46

When we put this into Bayes', we find that the probability that the short-haired individual we saw was a girl is 13%, as illustrated in (246).

(246) Conditional probability: *A Girl* (g), *given Short Hair* (e)

$$Pr(g|e) = \frac{Pr(g)Pr(e|g)}{Pr(e)} = \frac{(0.6)(0.1)}{(0.46)} = .13$$

The prior probability is given by the objective fact that the school is 60% girls.[32] The prior probability that the person you saw was a girl was 60%, and after the addition of the condition of short hair was added, the conditional probability is lowered from 60% ($Pr(g)$) to 13% ($Pr(g|e)$). Thus, short hair is not evidence that the person crossing the campus was female.

[31] The likelihood of short-haired girls x % of girls + the likelihood of boys with short hair x the % of boys: (0.1 x 0.6) + (1.0 x 0.4) = 0.46)

[32] The usefulness of Bayes' and subjective probabilities become stickier when we assign priors based on beliefs. One issue that is raised with respect to the usefulness of Bayes' Theorem for evaluating whether to accept something as evidence often concerns the value that is assigned to the prior probability, and how *informative* or *uninformative* it is (Schum 1994).

In the case that your hypothesis is that you saw a boy (b) given short hair (e), however, then short hair in this case is evidence. We change the probability from 10% to 100%, since all boys have short hair.

(247) Conditional probability: *Boy* (b), *given Short Hair* (e)

$$Pr(b|e) = \frac{Pr(b)Pr(e|b)}{Pr(e)} = \frac{(0.4)(1.0)}{(0.46)} = .86$$

We see that in (247) the conditional probability of $Pr(b|e)$ is a substantial increase, to 86% ($Pr(b|e)$) from 40% ($Pr(b)$). Therefore, short hair can be considered evidence that a student is a boy.

Explanation and Positive Probability Increase

A complaint often raised for modeling evidence with conditional probability increase alone is that it is not always the case that a rise in probability of h given e confirms that e is evidence for h. Probability can increase for a variety of reasons that are not always evidential.

> When I walk across the street I increase the probability that I will be hit by a 1970 Cadillac; but the fact that I am walking across the street is not evidence that I will be hit by a 1970 Cadillac. When Mark Spitz goes swimming he increases the probability that he will drown; but the fact that he is swimming is not evidence he will drown... What these examples show is that for e to be evidence that h it is not sufficient that e increases h's (prior) probability.
>
> (Achinstein 1978: 152)

Achinstein (1978/1983, 2003) uses the example given above to illustrate that conditional probability formulae lack what he refers to as the "explanatory connection" between evidence

and the hypothesis or unknown proposition. Achinstein gives the following in (248) for what he calls POTENTIAL (or INDICATOR) EVIDENCE.[33]

(248) ACHINSTEIN'S (1978/1983, 2003) ASSUMPTIONS

Assumption 1: For any hypothesis h and putative evidence e there is some number k greater than or equal to zero such that if e is a good reason to believe h, then $p(h|e) > k$.[34]

Assumption 2: For any e and h, if e is a good reason to believe h, then e cannot be a good reason to believe the negation of h ($\neg h$).

(249) ACHINSTEIN'S (1978/1983, 2003) PROPOSAL FOR POTENTIAL EVIDENCE

e is **potential** evidence that h if and only if

(a) e is true,

(b) e does not entail h,

(c) p(h,e) > k,

(d) p(there is an explanatory connection between h and e, h&e) > k.[35]

(Achinstein 1983: 158-159)

According to Achinstein's proposal for evidence, the presence of e increases the probability of h, in addition to having what he refers to as an "explanatory connection", which excludes accidental probability increase in cases where e actually has no relation to h from being considered evidence.[36]

[33]For Achinstein, there are actually two types of evidence, POTENTIAL EVIDENCE (*indicator* evidence), or that evidence which does not entail the hypothesis but only points to it. VERIDICAL EVIDENCE (*confirmational* evidence), is that which confirms that a hypothesis is true.

[34]Achinstein (2003) admits that problems with this assumption of k are two-fold: (i) k doesn't have to be consistent across hypothesis, and (ii) there is no restriction on k– it could possibly be zero.

[35]The term "h&e" indicates that h and e are compatible.

[36]An example of which is Achinstein's (2003: 148) "Wheaties" argument.

Schum (1994) argues that instead of using conditional probability models such as Bayes' Theorem to model probabilistic reasoning, we should instead use it as a tool which can allow us to make claims in regard to the strength of evidence and probabilistic inferences drawn from that strength (Schum 1994: 51). For more discussion on Bayes' Theorem and its theoretical foundational validity, I refer the reader to discussion in Schum (1994).

3.4.1 Bayes' Theorem and Evidentials

The addition of the explanatory connection does not save conditional probabilities for modeling the evidence expressed by an evidential, as there are some cases where there is evidence, conditional probability and explanatory connection, but it cannot be reflected by an evidential. Conditional probabilities such as Bayes' have been applied to evidentials by McCready & Ogata (2007); McCready (2008); McCready (2010), see section 2.3.5). It does not seem that Bayes' can be applied directly to evidentials, e may evidence for h in terms of Bayes', but that which is evidence for Bayes' is not necessarily evidence for evidentials. Let us return to our example of the student of unknown gender. Recall that short hair was considered evidence for the hypothesis that the student was a boy (247), but not evidence for the hypothesis that the student is a girl (246). The inferential evidential is infelicitous in both cases, shown in (250).

(250) Context: You see a student at the school walking across the school quadrangle. You notice that the student has short hair (e). You know that at the school all the boys have short hair, although some girls do too. You have two hypotheses: that the student is a girl (b) or the student is a boy (b). According to Bayes, the probability that the

(i) Wheaties Example (2004: 148)
H: Michael Jordan eats Wheaties and will not become pregnant.
e: Michael Jordan eats Wheaties.
b: Michael Jordan is a male basketball star.

According to Achinstein, H entails e, with or without the inclusion of b, thus the conditional probability of H given e is very close to 1. Achinstein argues that it would be rather silly to call eating Wheaties evidence for Michael Jordan's not becoming pregnant, even if it is entailed by e. In this case, the eating of Wheaties and the ability to bear children do not bear an explanatory connection.

student is female, given the short hair ($g|e$) is 13%, and the probability that it is a boy given that condition ($b|e$) is 86%.

You then say:

(a) #Apparently/evidently that is a girl.

(b) #Apparently/evidently that is a boy.

Curiously, if we alter the scenario by adding the extra condition that you and a friend have been debating about whether this individual student is male or female, the adverbs *clearly/obviously* are felicitous when marking the hypothesis that the student is male.

(251) Context: You see a student at the school walking across the school quadrangle. *You and a friend are debating whether that person is male or female.* You notice that the student has short hair (e). You know that at the school all the boys have short hair, although some girls do too. You have two hypotheses: that the student is a girl (b) or the student is a boy (b). According to Bayes, the probability that the student is female, given the short hair ($g|e$) is 13%, and the probability that it is a boy given that condition ($b|e$) is 86%.

You then say:

(a) # Clearly/obviously that is a girl.

(b) Clearly/obviously that is a boy.

Whether *clearly/obviously* can be considered a true evidential is still a matter of debate, as its use seems to be sensitive to additional factors with respect to context that are independent of evidence. In the example with *evidently/apparently*, however, even though the speaker has evidence that supports the hypothesis that the student is male, the speaker cannot express this type of evidence in this context with an evidential. This is not to say that in cases where evidentials are felicitous one does not have evidence that increases the probability of a given hypothesis, which is marked by the evidential. It is not the case that evidentials can be modeled as expressing a simple conditional probability increase alone.

3.5 The Evidential Value of Hearsay

In the previous chapter, i discussed McCready & Ogata's (2007) proposal where they treated Japanese reportative evidentials and hearsay evidence were non-probabilistic, such that the inclusion of hearsay evidence did not increase the probability of the proposition marked with the evidential. This approach to hearsay evidence or reportative evidentials is also present in Faller's (2002) and Murray's (2010) analysis as well. Yet as we saw in examples such as Pedro's Hen (238) and Evidence Promotion (231), hearsay evidence, when marked by evidentials, does appear to increase the probability that a hypothesis is true, and thus can be considered evidence.

One field which concerns the evidence value of a previous assertion is legal scholarship in criminal law. The *United States Federal Rules of Evidence* give (252) as the basic rule of *relevant evidence*.[37]

(252) **Federal Evidence Rule 401** Definition of Relevant Evidence

> *Relevant evidence* means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.

Hearsay evidence has its own rule.[38] *The Hearsay Rule* is generally regarded as "one of the most fundamental, and at the same time most confusing, rules of evidence" (Choo 1996). The United States Federal Rules of Evidence gives the following definition of *hearsay* (which includes, oral, written or even non-verbal statements/assertions).[39]

(253) Definition of Hearsay Evidence

> *Hearsay* is a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted.

[37] Published by the Legal Information Institute, Cornell Law School, December 2009. For decisions interpreting the rules plus state evidence materials, visit the LII Evidence page: http://www.law.cornell.edu/topics/evidence.html

[38] It's not clear if this then is a tacit assumption that hearsay is not probabilistic.

[39] This rule is for *criminal* cases only (civil cases have different rules).

Exceptions to the Hearsay Rule

That which makes the Hearsay Rule so complicated are its exceptions. It is not the case that all hearsay evidence is inadmissible. These exceptions are divided into two categories: *Federal Rule of Evidence 803: Declarant Available*, when the source of hearsay is able to take the stand, and *Federal Rule of Evidence 804*, when the source of hearsay is unable to take the stand. I list some examples of each category in Tables 3.5 and 3.6.[40]

[40]What is listed here is by no means comprehensive (see the complete *Federal Rules of Evidence*, (2011)); text can be found online at: http://federalevidence.com/rules-of-evidence.

Present sense impression	A statement describing or explaining an event or condition made while the declarant was perceiving the event or condition, or immediately thereafter.
Excited utterance	A statement relating to a startling event or condition made while the declarant was under the stress of excitement caused by the event or condition.
Then existing mental, emotional, or physical condition	A statement of the declarant's then existing state of mind, emotion, sensation, or physical condition (such as intent, plan, motive, design, mental feeling, pain, and bodily health), but not including a statement of memory or belief to prove the fact remembered or believed unless it relates to the execution, revocation, identification, or terms of declarant's will.
Public records and reports	Records, reports, statements, or data compilations, in any form, of public offices or agencies, setting forth (A) The activities of the office or agency, or (B) Matters observed pursuant to duty imposed by law as to which matters there was a duty to report, excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel, or (C) In civil actions and proceedings and against the Government in criminal cases, factual findings resulting from an investigation made pursuant to authority granted by law, unless the sources of information or other circumstances indicate lack of trustworthiness.
Statements in ancient documents	Statements in a document in existence twenty years or more the authenticity of which is established.

Table 3.5: Federal Rule of Evidence 803: *Declarant Available*

Former testimony	Testimony given as a witness at another hearing of the same or a different proceeding, or in a deposition taken in compliance with law in the course of the same or another proceeding, if the party against whom the testimony is now offered, or, in a civil action or proceeding, a predecessor in interest, had an opportunity and similar motive to develop the testimony by direct, cross, or redirect examination.
Statement under belief of impending death	In a prosecution for homicide or in a civil action or proceeding, a statement made by a declarant while believing that the declarant's death was imminent, concerning the cause or circumstances of what the declarant believed to be impending death.
Statement against interest	A statement that: (A) A reasonable person in the declarant's position would have made only if the person believed it to be true because, when made, it was so contrary to the declarant's proprietary or pecuniary interest or had so great a tendency to invalidate the declarant's claim against someone else or to expose the declarant to civil or criminal liability; and (B) Is supported by corroborating circumstances that clearly indicate its trustworthiness, if it is offered in a criminal case as one that tends to expose the declarant to criminal liability.
Statement of personal or family history	(A) A statement concerning the declarant's own birth, adoption, marriage, divorce, legitimacy, relationship by blood, adoption, or marriage, ancestry, or other similar fact of personal or family history, even though declarant had no means of acquiring personal knowledge of the matter stated; or (B) A statement concerning the foregoing matters, and death also, of another person, if the declarant was related to the other by blood, adoption, or marriage or was so intimately associated with the other's family as to be likely to have accurate information concerning the matter declared.

Table 3.6: Federal Rule of Evidence 804: *Declarant Unavailable*

As we see from the selected list of exceptions in Tables 3.5 – 3.6, there are several common themes to the exceptions. One common theme seems to be the effect of immediacy of the utterance. In some cases, a speaker is considered to have not had enough time to intentionally assert a falsity, such as with *Present sense expression, Excited utterance*, and *Statement under belief of impending death.*[41] Another common theme is the exception regarding statements about the self, such as in *Then existing mental, emotional, or physical condition* and *Statement of personal or family history* (and perhaps *Statement against interest*). Lastly, *Former testimony*, a statement has been asserted under the sworn oath of truth; in such cases lying is not simply insincere, but criminal.

These exceptions parallel the alternation pattern of the REPORTATIVE/HEARSAY and DIRECT evidentials to mark hearsay evidence. For example, the exceptions of *Then existing mental, emotional, or physical condition* and *Statement of personal or family history* seems to be reflected in evidentials in Evidence Promotion cases, where statements from trustworthy individuals about themselves are considered direct evidence, and are relayed with a DIRECT evidential (and not a REPORTATIVE). It is also not surprising that *Public records and reports* and *Statements in ancient documents* are exceptions to the hearsay rule, as for centuries, ancient texts were the only source of evidence (Hacking 1975), and data from evidentials also reflect this hearsay rule exception. The Turkish indicative past tense marker (DIRECT evidential) *-dI* (Aksu-Koç & Slobin 1986), the Cheyenne DIRECT evidential -∅ (Murray 2010), and the Cuzco Quechua DIRECT evidential *-mi* are all used to relay encyclopedic facts or information from authoritative texts. The parallels between the exceptions to hearsay in the law and the use of evidentials should not be taken to be accidental.

We can conclude from the discussion that we must separate our notions of hearsay evidence and reportative evidentials. Evident from the above discussion is that hearsay as an evidence source is variable, as it can be as good as direct evidence or not even evidence at

[41] Here the speaker is unlikely to recant, although one can imagine a case where there may be an exception.

all. Whether the REPORTATIVE/HEARSAY evidential retains that same variability of quality of the hearsay source as well, remains an open question; we still do not have a good account for how evidence relates to evidentials.

3.6 Evidence Contexts and Reasoning

We have discussed many aspects of specific evidence source types and their associated values, but the discussion thus far has proved to be somewhat unenlightening in terms of what is evidence for evidentials, what constitutes evidence that allows for felicitous evidential use. Perhaps a more informative line of questioning is to ask about evidentials concerns the types of contexts where evidentials are uttered and how these contexts differ from those when they aren't. The majority of the descriptions of the evidence signal of evidentials are those where we find evidentials, but as we saw from the previous chapter, when we attempt to apply these descriptions in new contexts that involve what should be the right evidence type, these descriptions prove to be uninformative. The evidential in these cases is found to be infelicitous, yet there is nothing offered in the description of source type that can explain the infelicity.

We have collected a number of key scenarios throughout the dissertation that illustrate those instances where definitions of evidence source types, particularly for the APPARENT, are uninformative. I provide a summary of these scenarios and their descriptions in Table 3.7.

Scenario		*Description*	*Evidential*
Wet Street		The speaker walks outside to find the street is wet and infers that it has rained.	Apparent
Drunken Wine		The speaker been keeping wine bottles in his office, but discovers that bottles are missing from the box.	
	A	You know John likes wine.	Assumed (# Apparent)
	B	You know John likes wine *and* you find empty wine bottles in John's office.	Assumed; Apparent
Lost Keys		The speaker has misplaced his keys, he has looked multiple places without success, and infers that they are in his car.	Assumed (# Apparent)
Shell Game		The speaker is told that a coin is hidden under one of three shells, and he has been shown it is not under two of the shells, and infers that it is under the third.	Assumed (# Apparent)
Gross Food		The speaker walks by a restaurant window and sees a plate of food that looks unappetizing, and he infers that it would taste disgusting.	Assumed (# Apparent)
Evidence Promotion		The speaker has been told by someone that she is planning on doing something.	
	A	She usually does what she says she will do.	Direct (# Reportative)*
	B	She usually does not do what she claims.	Reportative #Direct
Mirative		The speaker has direct evidence for a proposition that he is surprised to find is true, such that he does not use the direct evidential (evidence demotion).	Apparent (# Assumed)
Pedro's Hen		A farmer, Pedro, returns to find that one of his hens is missing and a trail of bloody feathers, he infers that a fox took his hen. His neighbor then reports that she saw a puma take it	Reportative ≥ Assumed

*In some languages, only the reportative is the felicitous (Krawczyk 2009).

Table 3.7: Evidence Context Types, Summary Descriptions & Felicitous Evidentials

The evidence source type approach to evidentials could not predict the infelicity of the APPARENT evidential in cases where there appeared to be observable evidence (such as in the Lost Keys, Shell Game, Gross Food, and even Drunken Wine). Any approach that argued that evidential utterances committed speakers to specific evidence source types (such as McCready & Ogata 2007; Davis et al. 2007), could not account for cases such as Evidence Promotion (or the Mirative/Evidence Demotion). Additionally any analysis which overtly specified that the REPORTATIVE evidential utterance was weak could not account for the felicity of the REPORTATIVE in Pedro's Hen scenario, such that it seemed to cancel the inference relayed with a CONJECTURAL evidential.

We have yet to discuss a mechanism or theory that appropriately models these evidence source types of evidentials. Evidentials seem to diverge from the descriptions given of their evidence signal and assumed source types, and they cannot be modeled in terms of conditional probabilities alone. Investigation from the perspective of the evidence source type of the evidentials seems to be routinely uninformative. Here we shift the investigation away from source types, and investigate what exists in all contexts listed above that makes for felicitous and infelicitous use of the APPARENT and REPORTATIVE evidentials.

It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.[42]

3.6.1 Evidence Context

One theme present in all of the contexts in which we find felicitous uses of evidentials, is that in each case the speaker of the evidential does not know the truth of the proposition prior to the acquisition of evidence. This seems like a rather basic observation, but it is an essential one. Take the following from Austin (1962).

[42] Arthur Conan Doyle's character Sherlock Holmes, *The Adventures of Sherlock Holmes*, p.163

> The situation in which I would properly be said to have evidence for the statement that some animal is a pig is that, for example, in which the beast itself is not actually in view, but I can see plenty of pig-like marks on the ground outside its retreat. If I find a few buckets of pig food, that's a bit more evidence, and the noises and smell may provide better evidence still. But if the animal then emerges and stands there plainly in view, *there is no longer any question of collecting evidence; its coming into view doesn't provide me with more evidence that it's a pig, I can just now see that it is.*
>
> (Austin 1962: 115 [emphasis mine])

Yet it is not descriptive enough to note that the truth-value of the proposition in question is unknown, as there are many propositions we don't know to be true or not. An additional property that we must ascribe to this unknown proposition is that knowledge of whether this proposition is true or not is relevant and important to the context. Thus there are two basic properties that exist in all evidence-gathering contexts: (i) the truth-value of the proposition in question is unknown; and (ii) resolving the truth of this proposition is important for the task at hand. Since our main concern here involve discourse contexts and declarative utterances, we assume the main task at hand is information exchange.[43] We can call this particular type of discourse context an EVIDENCE CONTEXT, summarized in (254), which we assume to be in a non-faulty context (i.e., not a context in a demon's world).

[43]I remain agnostic in terms of what model of the discourse is adopted, and only assume what exists is some type of information state/context.

(254) Evidence Context

A context C, composed of a speaker-agent a and interlocutor i, is an evidence context C_{EV}, if and only if

(a) there is a proposition p that is unknown to a;

(b) a assumes that i also does not know p; and

(c) the truth value of p is relevant to the discourse

In the proposal given for the evidence context, the first and last items ((254a) and (254c)) follow from the previous discussion. The second item in (254b) warrants some further discussion. Recall the discussion in McCready (2010) (section 3.3.2), where both Japanese and Yup'ik native speakers accepted the use of the inferential evidential from a Gettiered individual, who had reasoned a proposition to be true based on false evidence. McCready concluded that judgments such as these indicated that a judge of evidence is necessary in determining what is evidence. In the case of evaluating evidence for evidentials, it is only the judge, speaker-agent a, who is necessary for determining what is evidence.[44]

Let us imagine a case where an interlocutor i is present, and this interlocutor i knows p, $p \in K_i$. If it is common knowledge that i knows p, such that $(p \in K_i) \in K_a$ (and thus $p \in \{K_i \cap K_a\}$), then a would have no reason to assert, propose or present p. In this case, the conditions in (254a) and (254c) are not met, as p is in the common ground and thus the truth-value of p is not relevant.

If we alter this case slightly, such that $p \in K_i$, but a does not know that $p \in K_i$ ($(p \in K_i) \notin K_a$), then the above conditions are met. In the case that a were to utter the evidential-marked proposition and i were to either deny or confirm the proposition to be true based on i's certain knowledge, i's actions would be considered quite infelicitous.

(255) Context: Ben, Phil and John are friends. Ben and Phil are going to a movie. Ben wants to see if John wants to come too, so he decides to stop by John's house. John's lights

[44] With the exception of *clearly/obviously*.

are out, his car is missing, and when Ben knocks on the door, no one answers.

Ben returns to the car to inform Phil:

Ben to Phil: *Evidently John is not at home.*

Phil to Ben: *Yeah, he's at a race today.*

Ben to Phil: *So why did you let me go look for him?!*

As we see in the example above, it is not that Ben's utterance is taken to be infelicitous, but rather Phil's lack of indication that the third component of the evidence context, that it was not the case that the truth-value of p was unknown. A discourse context such as this, where an interlocutor obscures relevant knowledge, can be considered a disingenuous discourse context. Thus, we can further specify where evidence contexts are true, felicitous evidence contexts in (256).

(256) True Evidence Context

A context C, composed of a speaker-agent a and interlocutor i, is an evidence context C_{EV} if and only if

(a) there is a proposition p that is unknown to a;

(b) s assumes that i also does not know p; and

(c) the truth value of p is relevant to the discourse

C_{EV} is a felicitous evidence discourse context if and only if $p \notin K_i$

It is not the case that Ben's reasoning in the above context is false, as it is evident that John is not at home, and it happens to be true that John is not at home.[45] It is simply that Ben's assumption about the discourse context was false, and thus his utterance was redundant since p was known to one of the members of the discourse. Yet Phil's knowledge that p, or even his presence, does not have any impact on Ben's use of the evidential; in this case Ben could have uttered the evidential expression felicitously to himself. In this case, i

[45]This would satisfy Williamson (2000).

and a have the same referent, $i = a$.[46] Ben reasoned correctly from what he observed given what he knew to be true.

3.6.2 Reasoning Types and [Indirect] Evidentials

We have seen that all evidentials seem to reflect some type observation-based reasoning.[47] Hearsay evidence could be said to be an observation of a previous assertion. All cases can be described as reasoning which is prompted by observation. Reasoning can be commonly categorized into three basic types: deduction, induction, and abduction. The latter two reflect non-monotonic, defeasible reasoning, reasoning to a conclusion that goes beyond the logical premises (that is, the addition of new information in non-monotonic reasoning may render inference invalid). An example of defeasible reasoning is where I have reasoned that it has rained based on the fact that the street is wet. When I turn the corner, I see that a street sweeper has been spraying water as it drives down the streets. In this case, my conclusion that it rained has defeated my inference that it rained due to the fact that I now also know there is another cause for the wet street. (Logical) Deduction is reasoning that is not defeasible. Logical deduction is monotonic, that is the conclusion follows from logical premises (the addition of new information does not affect the validity of the conclusion).

Deductive Reasoning

Faller claims that the Cuzco Quechua inferential CONJECTURAL (ASSUMED) evidential *-chá* marks those propositions which the speaker has "acquired" by reasoning, and this includes "mere speculations, assumptions, hypotheses, as well as inferences, that is, deduction, abduction, and induction." (2002: 2) An example of a deductive inference is given in (257).

(257) Example: Deduction

If John is a good rower, then he is tall.

[46] Perhaps split personalities could pose a problem, although perhaps each personality could receive its own index.

[47] Exceptions may exist in the case of the ASSUMED evidential.

John is a good rower.

Therefore, John is tall.

It is not the case that both types of inferential evidentials (the APPARENT and ASSUMED) can express the conclusion in (257). We can illustrate this with English *apparently/evidently* and *presumably*, as shown in (258).

(258) EVIDENTIAL DEDUCTIVE REASONING

If John is a good rower, then he is tall.

John is a good rower.

(a) # Apparently/Evidently, John is tall.

(b) Presumably, John is tall.

In the above example, the ASSUMED seems to be felicitous, but the APPARENT is not. Faller claims that propositions deductively inferred can be marked with the ASSUMED *-chá*, and argues that inferential evidentials, similar to epistemic modals such as *must*, do not mark propositions that have been reasoned from *logical* deduction. I repeat the relevant passage below.

> Thus, *-chá* cannot be used when the speaker believes (s)he has come to *know* something through his or her own reasoning. This is also the case for epistemic *must*... consider a logician who has worked hard to deduce a conclusion p from a set of premises and logical rules. Then (s)he would probably not use *must* p but *I know that* p *(because it is entailed by the premises)* or simply p, if indeed (s)he is convinced she made no mistake in the deduction.
>
> (Faller 2002: 177, fn.4)

Non-logical deduction seems to be the type of inference that is argued to be expressed by inferential evidentials, as De Haan (2001) defines inferential evidentiality, either the

ASSUMED or APPARENT, as "the grammaticalized way of showing that the speaker makes his or her statement based on a deduction from facts, and not on a direct observation of the action itself." (2001: 193) Additionally, because inferential evidentials are argued to have an epistemic modal component, similar to *must*, we expect the inference expressed by *must* and the evidential to be similar.

> It is clear that it is the notion of deduction or inference from known facts that is the essential feature of *must*, not just the confidence of the speaker, which is expressed by the adverbs *certainly, definitely,* etc.
>
> (Palmer 2001: 35)

It is not clear why Palmer separates deduction from inference, but in either case, these descriptions do not reflect both types of inferential evidentials, only the ASSUMED (CONJECTURAL) types.

Non-logical deduction, which I will call *pseudo-deduction* and eliminative reasoning cannot be expressed felicitously with the APPARENT, but can with the modal *must*, as was shown in the Lost Keys and Shell Game scenarios. Neither of these cases are examples of monotonic inferences, since (i) the conclusion is not entailed by what is known in the speaker's information state, and (ii) the introduction of new data can render the conclusion false.[48] Cases where propositions are reasoned to a certainty are infelicitous when marked with an inferential evidential is illustrated in example (259).

[48]This is along the lines of the complaint raised by Karl Popper (1959, 1963) for inductive reasoning being the model of scientific reasoning, as some conclusions made by induction are not falsifiable.

(259) Evidential Calculations (*Yup'ik*)

Context: You are paying your monthly bills (gas, electric and water). You add each, which comes to a sum of $30.

You say the following:

# *akilit-arkau-**llini**-apuk*	*yuinaq*	*qul-mek*	*cipluku.*
pay-supposed.to-INF-IND.3SG$_s$-1DU$_o$	twenty.ABS.3SG	ten-ABL-MOD.3SG	remainder

(Intended: 'Evidently we owe thirty dollars.')

In the example in (260), the inferential APPARENT evidential *llini* is not felicitous in the case that you have added all bills and they come to an amount consistent with that you normally pay. In the case that this amount is an abnormal amount compared to what you usually pay, then the utterance with *llini* is felicitous, as this case is an example of the mirative use of the inferential evidential.

This is also the case for Cuzco Quechua *-chá*.

> If it [*-chá*] were a pure evidential, we would expect it to be felicitous in a situation in which the speaker makes a deduction, and has no reason to doubt his or her conclusion. For example, I might have bought a certain kind of potatoes for 50 cents a kilo last week, and now they cost 1 Sol. In this situation, I can deduce that the price of this kind of potato has doubled beyond doubt, but I could not use *chá* to convey this deduction without also indicating that I do have doubts that I calculated right. One can imagine that a child in school would give an answer to a math problem using *chá*.
>
> (Faller 2002: 177)

Similar to *-chá* if the speaker were to use *llini* in this case, he would be taken to indicate that he believes his calculation may be incorrect. Like *-chá*, *llini* does not express step-by-step reasoning to a valid conclusion. The same is the case for *evidently/apparent* and *presumably*.

(260) Evidential Calculations (*English*)

Context: You are paying your monthly bills (gas, electric and water). You add each, which comes to a sum of $30.

You say the following:

(a) # Evidently/Apparently we owe $30.[49]

(b) # Presumably we owe $30.

Inferential evidentials, if they do reflect deductive reasoning, must be to a deduction that is to some degree uncertain, which is not logical deduction, but reasoning that is non-monotonic. It may be the case that logical deduction can be expressed with direct evidentials (direct; nv-sensory), but direct evidentials are never discussed in terms of the reasoning they express. We also saw, however, that pseudo-deductive and eliminative reasoning is also not expressed with the apparent inferential evidential, either.

Non-Monotonic Reasoning

Inductive reasoning is non-monotonic. There are two types of inductive arguments (Vickers 2010).

(261) Forms of Inductive Argument

(a) *From general premises and particular conclusions*:

All observed emeralds have been green.

Therefore, the next emerald to be observed will be green.

(b) *Valid deductions with particular premises and general conclusions*:

New York is east of the Mississippi.

Delaware is east of the Mississippi.

[49] Similar to what we find with *llini*, in the case that this amount is surprising, the evidential here is felicitous.

> Therefore, everything that is either New York or Delaware is east of the Mississippi.
>
> (Vickers 2010[2011])

For the discussion here, I focus on the first type of inductive reasoning, given in (261a).[50] CD Broad famously referred to inductive reasoning as "the glory of science and scandal of philosophy," since standard logic systems cannot model inductive inference.[51] How children acquire knowledge about the world has been compared to scientific reasoning.

> The child-as-scientist metaphor is typically taken to mean that children and scientists are similar in the manner by which they acquire knowledge about the world. . . forming, testing, and revising causal theories about the world. Through such processes, it is supposed that children and scientists acquire an increasingly adequate understanding of the world.
>
> (Amsel & Brock 1996: 523)

If one witnesses multiple instances of a particular event, then one may then extrapolate to a general rule. Yet the fact that every emerald that you have seen is green, does not prove that in fact all emeralds you will see are green. There are exceptions, as emeralds can have a hue that's closer to yellow or blue than green. The question is then whether the evidence scenarios given in Table 3.7 reflect this type of reasoning. The answer to the question seems to be negative in the case of the English APPARENT evidential, but acceptable in the case of an ASSUMED evidential.

(262) EVIDENTIAL INDUCTIVE REASONING

All observed emeralds have been green.

Therefore, the next emerald to be observed will be green.

[50] Discussion of the second type is not included here, and consider the later a type of deduction in terms of the very basic discussion with respect to reasoning types here.

[51] The quote was taken from a 1926 lecture on "The Philosophy of Francis Bacon," and reprinted in Broad (1952).

(a) # Apparently/Evidently, the next emerald to be observed will be green.

(b) Presumably, the next emerald to be observed will be green.

There is no case that we have discussed which fits this type of reasoning (see Table 3.7). In fact, ASSUMED and APPARENT evidentials split in terms of inductive reasoning.[52] We see that the ASSUMED is felicitous in both the pseudo-deductive/eliminative reasoning cases as well as the inductive cases. The inference expressed by the APPARENT evidential does not seem to fit this form of induction, but it does seem that the ASSUMED is not specific to a type of reasoning; and thus it is not surprising that those who research evidential systems with ASSUMED evidentials have not further investigated the reasoning expressed by their inferential evidential. Agnosticism with respect to the type of reasoning expressed by evidentials, however, cannot be afforded for analyses with the APPARENT.

Abductive Reasoning

Abductive reasoning is reasoning about specific cases using general knowledge. Abduction as proposed by Charles Sanders Pierce (Collected Papers (CP), 1931-1958) is taken to model the reasoning process which proceeds from the data at hand to the "best-fit" hypothesis which explains the data (Walton 2004). The best-fit explanation is that which is the most simple, straightforward and ordinary. The best-fit explanation is the product of what Peirce calls the "guessing instinct," guided by the Principle of Economy (CP 6.477). Pierce's conception of abductive reasoning has been argued to have the logical form of "inverse *modus ponens*",[53] the backward reasoning from the consequent to the antecedent (Wirth 1998). Pierce argues that abduction is taken to be a form of the scientific method, claiming that "every single item of scientific discovery which stands established today has been due

[52] The discussion of induction here was limited. Please see Hawthorne (2011) and Vickers (2010[2011]) for more discussion on induction.

[53] *Modus Ponens*: If P, then Q. Q. Therefore P.

to Abduction." (Pierce 1965V: 106, cf. Walton 2004: 8). The Peircian abductive argument is given in (263), which he refers to as "retroductive reasoning" (CP 1.74, cf. Wirth 1998).[54]

(263) Peirce's Retroductive Reasoning

The surprising fact C, is observed.

But if A were true, C would be a matter of course.

Hence, there is reason to suspect that A is true.

(CP 5.189, cf. Walton 2004: 13)

An example of an abductive inference is given in (264).

(264) Example: Abduction

[Surprisingly] The street is wet.

When it rains, the streets become wet.

Therefore, it rained.

In the case of abductive reasoning, the English APPARENT (and ASSUMED) evidential is felicitous, as shown in (265).

(265) Evidential Abductive Reasoning

[Surprisingly] The street is wet.

When it rains, the streets become wet.

(a) Apparently/Evidently, it rained.

(b) Presumably, it rained.

Previous descriptions of the inferential APPARENT evidential were not entirely incorrect in arguing that an evidential such as the inferential APPARENT required "observable evidence" to be present. These arguments were perhaps misled in assuming that only the APPARENT

[54]Pierce claims that the above is a valid form of inference because it is of a "a perfect definite logical form" (CP 5.188), but this is not how abductive reasoning is usually viewed (Douven 2011.

had this requirement. In all felicitous evidential cases, there needs to be a specific instance, usually an observation, that must be explained (not just in the case of the APPARENT). In the case of the APPARENT, however, it is not enough that simply an observable trigger is present; as discussed, observable evidence can be said to be present in many cases where the ASSUMED is felicitous, such that there is often an observable trigger present in many cases of the ASSUMED as well. The difference between felicitous and infelicitous cases of the APPARENT is that in the case of the APPARENT, the explanation must be a best-fit explanation. To illustrate that abduction is the type of reasoning that fits, rather than focusing on felicitous uses of the APPARENT, we explain infelicitous cases of the APPARENT.

The following scenarios were found to be either infelicitous with the APPARENT, or where speakers did not consider the APPARENT (or any evidential really) their first-choice expression: Lost Keys, Shell Game, Gross Food, and Drunken Wine A. I have repeated the relevant portion of the of Table 3.7 in Table 3.8.

Scenario		*Description*	*Evidential*
DRUNKEN WINE		The speaker has been keeping wine bottles in his office, but discovers that bottles are missing from the box.	
	A	You know John likes wine.	ASSUMED (# APPARENT)
	B	You know John likes wine *and* you find empty wine bottles in John's office.	ASSUMED; APPARENT
LOST KEYS		The speaker has misplaced his keys, he has looked in multiple places without success, and infers that they are in his car.	ASSUMED (# APPARENT)
SHELL GAME		The speaker is told that a coin is hidden under one of three shells. He has been shown that it is not under two of the three shells, and infers that it is under the third.	ASSUMED (# APPARENT)
GROSS FOOD		The speaker walks by a restaurant window and sees a plate of food that looks unappetizing, and he infers that it would taste disgusting.	ASSUMED (# APPARENT)

Table 3.8: Infelicitous Contexts of the APPARENT Evidential

Recall that another component of abductive reasoning is that it is reasoning to a best-fit explanation, which is informed by a guessing instinct that is economic in its consideration of possible explanations that could be given to account for the observation. In each of the cases above, the infelicitous use of the APPARENT can be explained by the fact that the speaker offers an explanation that is not the best-fit.

Drunken Wine A

In the case of the Drunken Wine A scenario, the speaker-agent observes that there are wine bottles missing from a box. He must explain how these wine bottles are missing. It is a likely explanation that one of his colleagues has taken some of the wine bottles, but it is also possible that someone outside the department helped himself to some wine. Of the people in the department, he knows that John has a particular taste for wine, and is known to finish a bottle by himself, but other colleagues drink wine too (just maybe not as much). In Drunken Wine A, the speaker expresses that John drank the wine, given what he knows. The APPARENT evidential in this case is entirely infelicitous, as the *John drank the wine* is not the best-fit, most economic explanation given the number of other viable explanations that exist. Given what the speaker knows, a student could have been swiping the bottles from his office, and there is nothing given in the scenario which renders this a less-viable hypothesis. In the case of Drunken Wine B scenario, however, the speaker has an additional observation that requires explanation, as some of those wine bottles have been found in John's office. In this case *John drank the wine* is the single best-fit explanation given the two observations. A competing hypothesis may be that perhaps the explanation that a student has been pilfering the wine and hiding the bottles in John's office is too far-fetched, involving less-economic reasoning, violating Occam's Razor by making more assumptions than are necessary in order to explain the observation, than the proposition *John drank the wine* does.

Lost Keys/Shell Game

We can explain the infelicity of the evidential in the case of the Lost Keys. Here the speaker cannot locate his keys, and he has looked throughout his house, exhausting his typical places, his first round of best guesses: the table by the door, the couch cushions, his jacket pockets, and his pants pockets. His observation has changed now to be that (i) his keys are missing and (ii) they are not in their usual places. There are multiple places which he has yet to look. He has been known to leave his keys in the ignition of his car, but he has also been known to forget them in the lock of the front door, or drop them while he struggles to open the front door holding groceries. Thus he has at least three viable options, the most likely of which he reasons to be his car. All three options explain his observation that his keys are missing and not in their usual places; it is not the case that the fact that they are in the car is the best-fit explanation for this observation as all three could explain both (i) and (ii) equally well. In addition to this fact, if the car ignition were an extremely probable explanation, then it perhaps would not be a place he looked after he exhausted all the places inside the house. In this sense, "outside" is a last resort, but there are still a number of places the keys could be outside of the house. Thus the speaker cannot mark the proposition *my keys are in the car* with the APPARENT evidential, it is simply not the best-fit explanation given his guessing instinct.[55]

In the case of the Shell Game, it seems that St'át'imcets speakers are more dubious of the individual running the game than perhaps English speakers are. Recall that in this case, your observation is that the coin is not under two of the three shells. There are two possible explanations: (i) the coin is under the third shell, or (ii) the coin was never under any of the shells, and the speaker is the victim of a ruse. These two possibilities, if they are considered live options by the speaker, are equally probable, it is just as likely that the coin is under

[55]Note that some English speakers accept the use of *apparently/evidently* to be felicitous in this case of the Lost Keys. For these speakers, it seems probabilities do not redistribute once the initial likely options have been proven false. For these speakers, the other options are either not considered or simply rendered to have an extremely low probability, such that the car is the best-fit for them. This is not the predominant judgment of the evidential in this scenario.

the third shell as it is not there at all. It seems that English and Yup'ik speakers who judge the use of the APPARENT to mark the proposition *It is under the third one* to be felicitous assume that the game is legitimate and not a ruse.

Gross Food

In the Gross Food case, the speaker has the observation of what appears to be an unappetizing dish that is placed in front of an anonymous diner in a restaurant window. In this case, the proposition *That dish tastes disgusting* does not explain why the food has an unappetizing appearance, even if it were true that the dish is disgusting. One does not explain the other, and this is surprising. Here the speaker requires an observation indicative of disgusting taste, and disgusting appearance does not suffice for felicitous use of the APPARENT. This is not to say that the speaker's inference in this case is completely preposterous, it is simply not one that is at all explanatory of his observation.

When we alter the scenario slightly, and the speaker observes the diner take a bite, wince, and spit out the food, the APPARENT in this case is felicitous in marking the proposition *That dish tastes disgusting*. In this case the speaker has an additional observation, that the diner has an adverse reaction to the food once he tastes it. In this case, the best-fit explanation for why someone would spit food out should be *That dish tastes disgusting*, and is a case of an observation indicative of disgusting taste. It does not matter how the dish appears, it could look extremely appetizing, yet the best-fit explanation would be the same. Thus, appearance has no effect in terms of the felicitous use of the evidential.

Abductive reasoning seems to target an element of the semantics of the APPARENT evidential that was missing from previous formal and typological descriptions. The data seem to support the proposal that evidentials mark those propositions which are inferred by abductive reasoning.[56]

[56]It may be important to note that evidentials mark the product of abductive reasoning and not the reasoning process, as in each case, the evidential marks the explanation the speaker has chosen based on his reasoning. See Alisedeh 2006 for discussion about abductive process versus abductive product.

Abduction, Hearsay and Propositional Form

I mentioned briefly at the beginning of the section that hearsay can be considered to be an observation of an assertion. The relation between a previous assertion of a proposition and the truth of that proposition has been argued to be an example of an abductive inference. For example Harman (1965), Adler (1994), Fricker (1994), and Lipton (1998) (cf. Douven 2011) argue that the fact that we generally trust a reliable person's testimony is reflective of abductive reasoning. Adler (1994, 274f) argues that the best-fit explanation for why someone would assert p is that he believes p, and by asserting p, he may intend that his addressee believe p as well. This assumption is the result of the conditions on felicitous discourse, such as Grice's (1975) Conversational Maxims.

(266) Grice's Conversational Maxims

Quality	Do not say false things.
	Do not say things for which you lack evidence.
Quantity	Make your contribution as informative as is required
	for the current purposes of the exchange.
Relevance	Be relevant.
Manner	Be clear. (Avoid ambiguity, opacity, prolixity, and non-sequiturs.)

Assuming Gricean conversation maxims are in place and adhered to by discourse participants, the best-fit explanation for why someone would assert p is that p is true.[57] If the speaker asserting the proposition is being uncooperative and infelicitous, often asserting falsities, then that p is true is not the best-fit explanation for why an uncooperative speaker would assert p (see Bach & Harnish 1979; Dascal 1979; Hobbs 2004).

We can perhaps use abduction to explain the infelicity of the following example, repeated here from section 1.2.4, where we saw that the felicity of the reportative evidentials *supposedly* and *reportedly* were sensitive to the content of the original content. If the report

[57] Alternatively we could describe this in terms of Stalnaker (1978) sincerity of assertion.

expresses something similar, such as *Your$_i$ bike is gone*, it is not felicitous to relay the proposition *My$_i$ bike has been stolen* with the reportative.

(267) Propositional Form and the Reportative

A to B: Your bike is missing from the rack.

(a) **B to C:** Supposedly/reportedly my bike is gone.

(b) **B to C:** # Supposedly/reportedly my bike has been stolen.

In this case B has an observation of A's report that B's bike is missing, and a possible reason to explain why B would report that A's bike is missing is that his had been stolen. It is not clear that this explanation is the best-fit explanation of why B would only report that the bike is missing. If the reporting speaker believed it to be true that B's bike had been stolen, or has very good evidence of this fact, then if B were being entirely cooperative (adhering to Quantity) he would have asserted that it had been stolen, not simply missing. Since A did not assert *your bike is stolen*, he conversationally implicates he is not certain it was stolen, that all he can assert, felicitously assert is the bike is missing. In this case, *the bike has been stolen* is not the best-fit explanation for why someone would assert that the bike was missing.

Abduction gives us a powerful way to talk about the evidence signal of evidentials, and in the next section I discuss how we apply abduction to model the evidence signal of evidentials.

3.7 Best-fit Explanations and Evidential Evidence Relations

When you hear hoofbeats behind you, think horses, not zebras.[58]

As discussed previously, the best-fit explanation is the one that (i) explains the observation at hand, and (ii) is the one that is the most simple, where simplicity is given by that which is most common and most likely to occur. One example of abductive reasoning is the

[58]Version of the now well-known aphorism in medicine attributed to Dr. Theodore Woodward (March 22, 1914 – July 11, 2005), University of Maryland School of Medicine (Sotos 2006).

process of determining a medical diagnosis. When a doctor is presented with a patient, he takes a note of symptoms. Multiple diseases could explain these symptoms, yet some are more rare or preposterous than others. In such a case, the doctor's diagnosi8s should be that disease which is more typical than exotic, the horse and not the "zebra."[59]

Evidentials seem to mark horses, not zebras. Take the normal inferential evidential example in (268).

(268) EVIDENTIALS: HORSES, #ZEBRAS

Context: You have been in a windowless basement room studying for hours. You did not check the weather forecast before you came to campus, and the sun was out when you went inside. You decide to take a break outside and grab a coffee. When you walk outside you observe that the streets are wet.

You say:

(a) Evidently/Apparently it rained.

(b) # Evidently/Apparently there was a flash hailstorm, and the hail has now melted.

Evidentials target the most common explanation. In the case that new facts were to come to light, then perhaps the "zebra" is the best-fit. In the cases that all the "horses" are exhausted, then the "zebras" become plausible.[60] In this case, the zebra does not become more common, but an explanation that fits all of one's observations, assuming all observations are accurate and not perceived in a faulty context.[61] In the next section I discuss abduction is applied to a model of evidence for the evidential.

[59] *Zebra* is medical slang for an uncommon, rare or exotic disease.

[60] This perhaps explains some people's acceptance of the APPARENT evidential in the Lost Keys case. For some, the car appears to be the only remaining explanation.

[61] One example in medicine is given in Groopman (2007). In this case, the patient presents with some pain in his knee. The patient is an avid runner, and assumes that his injury is activity-related. The first doctor he visits assumes the same, and prescribes rest and ice. This treatment proves to be ineffective, and in a second doctor visit the patient is prescribed to wear a knee brace. Again the prescribed treatment is ineffective, and the patient's pain is only increasing. At the third doctor visit, the doctor takes an x-ray, which shows a growth at the end of the femur; a biopsy of which revealed the growth to be an osteosarcoma (bone tumor). While osteosarcomas are not uncommon. Prior to the x-ray, the explanation of bone cancer for knee pain would have been an implausible explanation and not a possibility worth considering in order to eliminate first.

3.7.1 The Basic Evidence Relation

I model the evidence signal of evidentials as a relation of how one's evidence (their observation), relates to their explanation, the proposition marked by the evidential, which is the product of abductive reasoning. The evidence relation is not the same as the linguistic expression, the evidential, but a general concept which evidentials express. There are four components that comprise an evidence relation, and since the evidence relation is based on abduction, these variables have a specific character.

An evidence relation R is a type of relation between an observation e, and an explanation p, and is determined by an agent a. In discourse contexts, this agent is the speaker of an [evidential] utterance.[62] The relation type R is characterized as how conclusive the relationship between e and p is, that is how certain e allows the speaker to be with respect to the truth of p. The observation is e is not only an observation, but one that is usually taken to be "surprising". I have repeated Peirce's Retroductive Reasoning in (269), and have altered the variables to reflect those that I use in the evidence relations.

(269) Peirce's Retroductive Reasoning

The surprising fact e, is observed.

But if p were true, e would be a matter of course.

Hence, there is reason to suspect that p is true.

(CP 5.189, cf. Walton 2004: 13)

Evidence as Observable Trigger

The "surprising" nature of e can be said to reflect that e is information that is new to the speaker. The fact that the evidence signal is new is what motivates Murray (2010) to model the evidence signal as a not-at-issue assertion, which expresses information that is new to the

[62] I do not assume that all abductive inferences are always relayed with evidentials utterances, but all evidential utterances are products of abductive inference.

common ground, compared to a presupposition, which is knowledge that is already-known or assumed by the discourse participants.

Aliseda (2006) offers two ways to model the surprising nature of the observation. According to Aliseda, observations can be either *novel* (agent observes φ) or *anomalous* (agent observes $\neg\varphi$), where both do not follow from an agent's background knowledge, but can be explained by the background theory Θ.

(270) Aliseda's (2006) Abductive Novelty and Anomaly[63]

(a) Novelty:[64]

φ is novel. It cannot be explained ($\Theta \not\Rightarrow \varphi$), but it is consistent with the theory ($\Theta \not\Rightarrow \neg\varphi$).

(b) Anomoly:

φ is anomolous. It cannot be explained ($\Theta \not\Rightarrow \varphi$), but its negation is consistent with the theory ($\Theta \Rightarrow \neg\varphi$).

(Aliseda 2006: 47)

Whether an observation is novel or anomalous is not imperative to account for in the model of evidence for evidentials here; much of the details of abduction are not necessary to discuss in order to apply abduction to a model of evidentials. I simply offer Aliseda's description as an example of how to model the surprising nature of the evidential observation.

[63] Aliseda (2006: 46)assumes the following logical form for abduction.

(a) Aliseda's Abductive Logical Form
The abductive process takes a background theory (Θ) and a given observation (φ) as inputs, and produces an abductive explanation (α) as its output.

$$\Theta, \varphi \Rightarrow \alpha$$

[64] Where Aliseda expresses "not follow" as $\Theta \not\Rightarrow \varphi$, $\Theta \not\Rightarrow \neg\varphi$, but this is confusing given how "consistent with the theory" is expressed, at least in this initial formulation.

For the model of the evidence signal of evidential, we must simply assume that the speaker did not know the evidence prior to his observation, but this is not the only assumption that we must make about the observation. In the case of evidentials, not only is it important to note that e is novel and is compatible with what the agent knows, but also that the agent must assumes that what he observes he takes to be accurate. If the speaker-agent believes that his perception is faulty, he will not determine the evidence relation to be the same as those cases in which he believes his perception is not faulty.[65]

Observation e is novel and is assumed to be true, but e is not the only variable in the evidence relation that is unknown to the speaker-agent. We model those propositions the speaker-agent assumes to be true as the set K_a. The speaker-agent must also not know p, but we assume that p is compatible with what the speaker knows, p is also the most likely of all other possible explanations that are also compatible with the speaker-agent's expanded knowledge set $K_a + e$.[66] I repeat the description of the condition of the evidence context in (271), which is assumed to be in a non-altered world.

(271) Evidence Context

A context C, composed of a speaker-agent a and interlocutor i, is an evidence context C_{EV}, if and only if

(a) There is a proposition p, such that

i. p is unknown to a;

ii. a assumes that i also does not know p; and

iii. the truth value of p is relevant to the discourse

(b) C_{EV} is a felicitous evidence discourse context if and only if $p \notin K_i$

[65] An example of which is the Mirative case.

[66] Note I borrow terminology from Belief Revision Theory, as proposed by Alchurrón, Gärdinfors & Mackinson (1985) and Gärdenfors (1988). $K_a + e$ is the operation of *expansion*, where a new proposition p is added to the agent's knowledge set K. See (312) for detailed definitions.

In all cases, the speaker-agent is the judge of evidence, who must determine which type of evidence relation he has prior to uttering an evidential.[67] All evidence relation types have the following basic principles, given in (272).

(272) A Basic Evidence Relation $R(a,\ e,\ p)$

In an evidence context C_{EV}, there is an evidence relation $R(a,\ e,\ p)$, that may be expressed by an evidential, if and only if

(a) e is an observation by a, and K_a is expanded to include e $(K_a + e)$;

(b) p is the hypothesis which is the best-fit explanation of e, given K_a in C_{EV}

An observation e is surprising to a speaker a. In most cases, e is compatible with K_a, such that the speaker expands his knowledge set K_a to include e, so that he must explain it. The explanation p is the hypothesis that is the best-fit explanation given his observation and what he assumes to be true. I provide a proposal for how the speaker-agent determines that he has a best-fit explanation given his observations following the proposals of the different subtypes of the evidence relations for evidentials of Yup'ik and English. For evidentials in Yup'ik and English, I propose there are three specific types of evidence relations: *Direct, Indirect*, and *Hearsay* (R_D, R_I, and R_H, accordingly).[68] There are more evidential expressions than there are evidence relations.

3.7.2 The Direct Evidence Relation

Those cases which typify the direct evidence relation are situations where one has direct, unmediated experience with their observation e, such that the inference of p follows directly and automatically. I give two examples of cases in which an agent has direct evidence in (273).

[67] NOTE: I occasionally drop the term "speaker-agent" in the prose of the discussion that follows. The terms "speaker" and "agent" interchangeably.

[68] The hearsay relation is actually an indirect relation with a more specified observation.

(273) Two Cases of Direct Evidence

(a) **Direct$_1$ (Witnessing):**

The agent witnesses one car hit another car.

Observation(s) e = Seeing the car hit another car; the result of damaged cars.

Explanation p = There was an accident.

(b) **Direct$_2$ (Non-visual Sensory):**

The agent feels a cashmere sweater, and notes that it is indeed soft.

Observation(s) e = Touching the sweater; the sweater feels soft.

Explanation p = This sweater is soft.

The direct evidence relation contains the basic elements of the general evidence relation given in (272). Here we parameterize to what extent the chosen explanation p can explain the observations e, and not the degree to which e confirms p. In Direct$_1$ scenario, the proposition that an accident has occurred best explains the speaker's observation, that he saw cars crash into each other, resulting in damage.

In the case of the direct evidence relation, the reader may question the proposal of direct evidence as an instance of abductive inference, and wonder why would we not just claim that the direct evidence simply entails the proposition. For an observation to be entailing, it must be true. This is undesirable, as we saw in earlier in the section on epistemology (section 3.3.1), perception and propositional knowledge are not always one in the same, as sometimes perception is flawed. We assume that the agent's perception here is not faulty and thus true, but this is only an assumption. The speaker could be evaluating the proposition in an altered world, such as if he had unknowingly stumbled onto a movie set. We assume that this is an instance where the agent has made a false assumption about the context C, that he assumed that he was on a real street and not a movie set. In the case that the agent were aware he were on a movie set, he would not report that there was an accident.

An additional reason for not modeling direct evidence as entailing is evidential-specific. We do not want to impose the sincerity condition that the speaker must have evidence that

entails the proposition to be true in order to felicitously utter a proposition marked with the direct evidential. An example of where this move would prove problematic is Evidence Promotion (section 3.2.1), where a proposition based on hearsay evidence, a previous assertion, is felicitously marked with a DIRECT evidential. If we were to claim that in the case of Evidence Promotion the speaker judges a previous assertion to entail that the asserted proposition is true, then the speaker would be infelicitous in the use of his evidential as assertions cannot entail the truth of the proposition asserted. In the case of evidentials, in order to avoid such consequences, I model the direct evidence relation as the speaker having a best-fit explanation that explains his observations, and this explanation is the only explanation which can account for what is observed, barring something faulty about the context or the speaker's perception. These two parameters are combined are additional parameters which are added to the basic evidence relation given in (272), to yield the direct evidence relation, which is given in (274).

(274) THE DIRECT EVIDENCE RELATION $R_D(a,\ e,\ p)$

In an evidence context C_{EV}, an evidence relation is **Direct** and of the form $R_D(a,\ e,\ p)$, if and only if

(a) a is certain[69] that p, as

(b) p is the best-fit and only fitting explanation of $K_a + e$, given that $K_a + e$ does not include false assumptions with respect to C that would make e false

Now let us discuss our direct evidence examples given in (273) with respect to the direct evidence relation as proposed above. The first case is one in which the agent has witnessed a car crash.

[69]Steven Kuhn (p.c.) suggests that instead of "is certain" we should have that "a feels certain", due to the fact that direct inference is modeled as defeasible entailment and not true entailment. Perhaps this is an issue with the model, that it is based on evidential expressions, and having direct evidence that p should entail p and thus make a certain that p.

(275) **Evidence Relation: Direct$_1$ (Witnessing)**

The agent witnesses one car hit another car.

Observation(s) e = Seeing the car hit another car; the result of damaged cars.

Explanation p = There was an accident.

In the example above, p is the best-fit explanation of the agent's observation e, and the only explanation given that none of his additional assumptions about the context are false. In the case where his observation took place on a movie set, an altered context of which he was not aware, his inference that p is the best and only fitting explanation for his observation e is defeated.

(276) **Evidence Relation: Direct$_2$ (Non-visual Sensory)**

The agent feels a cashmere sweater, and notes that it is indeed soft.

Observation(s) e = Touching the sweater; the sweater feels soft.

Explanation p = This sweater is soft.

In the example above, p is best-fit explanation of the observation e, and p is the only explanation as long as the agent makes no additional assumptions about the context that are false, or if there is something about the agent's mechanism of perception that is faulty such that it is uninformative. For example, if everything the agent touches feels soft, such that he would judge burlap and cashmere to have equivalent softness, the agent falsely assumes that his sense of touch provides accurate feedback. In this case, the inference that p is the best and only fitting explanation for e is defeated, as his faulty perception produces data that is equivocal.

The direct evidence relation is a intended to be a more specific, step-wise explanation of Faller's (2002) *Best possible grounds* (*Bpg*). Like Faller, we do not want to encode evidentials as expressing particular sensory types. Faller did not provide an explanation for how one determines *Bpg* (or *reason to believe* (*Rea*)). The direct evidence relation proposal offers a more specific explanation for how one evaluates their evidence with respect to a proposition, be it *Bpg* or otherwise. Like *Bpg*, the evidence relation does not correspond to a particular

sense, and can be extended to those cases such as evidence promotion, or those cases where non-visual sense is a better, more direct evidence source than visual is (as in source monitoring experiments discussed in section 3.2.2, which could not be explained when including evidential hierarchies).

3.7.3 The Indirect Evidence Relation

The indirect evidence relation is one in which the agent has evidence, but remains to some degree uncertain with respect to the truth of p. In terms of abduction, in the case of indirect evidence, there still remain other live options that could be explanations of the agent's observations given what he assumes to be true. These other live options are those which are far less likely and more implausible than the explanation the agent chooses. Similar to the direct case, I give two examples of indirect evidence contexts in (277).

(277) Two Cases of Indirect Evidence

(a) **Indirect$_1$ (Observable Facts)**

The agent sees black smoke emanating from a specific location.

Observation(s) e	=	Seeing that there is black smoke emanating from a specific location.
Explanation p	=	A building is on fire.

(b) **Indirect$_2$ (General Knowledge)**

On Tuesdays, Bob plays Bingo at the VFW

Observation(s) e	=	It is Tuesday; it is Bingo night at the VFW;
		Bob plays bingo at the VFW on Tuesdays; Bob is not home.
Explanation p	=	Bob is at the VFW playing Bingo tonight.

In the same way as the direct relation, the indirect evidence relation contains the same basic properties of the general evidence relation, as a best-guess hypothesis which can account for the facts at hand. The indirect relation comes with additional specifications in (278) below.

(278) The Indirect Evidence Relation $R_I(a,\ e,\ p)$

In an evidence context C_{EV}, an evidence relation is **Indirect**, and of the form $R_I(a,\ e,\ p)$, if and only if

(a) a remains uncertain that p, as

(b) p is the best-fit explanation but not the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C_{EV} that would make e false.

Let us return our examples of indirect evidence scenarios. In order to illustrate that multiple live options exist in the case of the indirect evidence relation, I have added an additional competing hypothesis q to the examples.

(279) **Evidence Relation: Indirect$_1$ (Observable Facts)**

The agent sees black smoke emanating from a specific location.

Observation(s) e	=	Seeing black smoke emanating from a specific location.
Explanation p	=	A building is on fire.
Explanation q	=	An angry woman has defenestrated all her husband's belongings and has set them ablaze in an alley.

As we see in the above example, we now have two competing explanations, p and q that can both account for the observation e. It is perhaps more improbable that someone has thrown the entire contents of an apartment and lit them on fire (a zebra), than it is that a building has caught fire either by some type of wiring problem of cooking accident (a horse). Both proposition express events that can occur, however and they both explain why black smoke may be emanating from a particular point. Due to the fact that in a default context, p is far more likely to be true than q, p is the best-fit explanation and easiest inference.

If we alter the context by adding additional assumptions to K_a, the default distribution of likelihoods may be altered, which may make the zebra the best-fit explanation. For example, let's say you can see your friend's apartment from your apartment window (f). You have

found out that your friend's husband has been having an affair from your friend who has recently become aware of this fact (g). Your friend is not taking the news very well (j). In fact, you were witness to your friend's most recent crime of slashing the tires and keying his mistress' car (k). Knowing these facts and that your friend is the violent, impulsive, and vengeful sort, such that $\{f, g, j, k\} \in K_a$, then you infer that the smoke coming from the general direction of your friend's apartment to indicate that yet another violent act of hers may have occurred. In this case the more implausible explanation q is best-fit. Unless contexts and their probability distributions are further specified to account for an agent's knowledge of specific, non-general knowledge, then the contexts are evaluated as default.

We turn now to the second example of the indirect relation, Indirect_2, which I have repeated below (280). I have also added another, competing explanation q to the scenario.

(280) **Evidence Relation: Indirect_2 (General Knowledge)**

On Tuesdays, Bob plays Bingo at the VFW.

Observation(s) e	=	It is Tuesday, It is Bingo night at the VFW, Bob plays bingo at the VFW on Tuesdays.
Explanation p	=	Bob is at the VFW playing Bingo tonight.
Explanation q	=	Bob is at a friend's house for dinner.

In a scenario such as the one above, the agent knows that in general, Bob plays Bingo regularly on Tuesdays at the VFW, but he has no other evidence at hand which truly points to this explanation, other than the fact that Bob is simply not at home. For all the agent knows, Bob's lady-friend Sally could have invited him over for her famous short ribs. In this case, p and q can equally account for the facts, but in general, p is more likely perhaps given that it is Tuesday and a Bingo night specifically. Bob does often go over to Sally's for dinner, so the probability that he may be there is perhaps equally as high. In such a case, p is determined as the best-fit explanation for what is observed, but is not determined in the same way as in Indirect_1. I discuss this in greater detail in the next chapter (section 4.1).

3.7.4 The Hearsay Evidence Relation

The direct and indirect evidence relations differed in terms of how certain an agent was that his explanation expressed is true. The direct relation was such that the agent is certain that his explanation is correct, but in the indirect case, the agent is still to some degree uncertain that his explanation is correct, as other possible explanations could account for the facts. The hearsay evidence relation is an indirect evidence relation, but with a specification on the type of observation that e can be.

The hearsay evidence relation is an indirect evidence relation, where e is the form of an observation of an assertion of a proposition p which was neither asserted by the agent a nor interlocutor i (Faller 2002; Murray 2010; see discussion section 2.2). The hearsay evidence is an indirect relation, as in most cases with hearsay evidence, the agent is still not completely certain that p is true. The hearsay evidence relation is a specified indirect evidence relation, with an explicit requirement on the form of the observation e, with additional conditions on the felicity of the original assertion (due to the nature of hearsay evidence). The hearsay evidence relation is the most source-type-like of the evidence relations discussed here. An example of a typical hearsay evidence scenario is given in (281). Here we assume that the original assertion is sincere.

(281) A Case of Hearsay Evidence

Your classmate told you that the Logic final was a doozy.

Observation(s) e	=	Your classmate's assertion that the Logic final was difficult, "a doozy".
Explanation p	=	The Logic final is difficult.

In the case where a prior assertion is considered evidence, the observation of an assertion of p is that p. The context of evaluation of evidence (C_{EV}), is in this case, assumed to be one in which all discourse participants are behaving cooperatively, and the speaker is asserting only those things he knows to be true or for which he has adequate evidence. The asserting speaker can only assert that which he knows to be true (he has some form of direct

evidence), and the reporting speaker then relays this asserting speaker's sincere assertion of direct evidence as his evidence. In this case, hearsay can be thought of as direct evidence by proxy. As discussed earlier in this chapter (section 3.5), hearsay evidence is subject to a number of variables, and thus its value as an evidence source is subject to this variability. The hearsay evidence relation, proposed in (282) describes those cases where the speaker is considered reliable and cooperative.

(282) The Hearsay Evidence Relation $R_H(a,\ e,\ p)$

In an evidence context C_{EV}, an evidence relation is **Hearsay** and of the form $R_H(a,\ e,\ p)$, if and only if

(a) e is the observation of a prior assertion of p, by an original speaker O in a cooperative context C, such that

i. $O \notin \{a,\ i\}$, and

ii. O's assertion of p is believed by a to be sincere and well-grounded;[70]

(b) a remains uncertain that p, as

(c) p is the best-fit explanation but <u>not</u> the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C that would make e false.

Let us discuss the evidence relation in terms of our Hearsay example, which I repeat below. Here the alternative explanation is that the final was fair, and perhaps your classmate only found it difficult because he did not study.

[70] O believes p to be true, or at least O has the appearance of believing p to be true.

(283) **Hearsay**

Your classmate told that you that the Logic final was a doozy.

Observation e	=	Your classmate's assertion that the Logic final was difficult, "a doozy".
Explanation p	=	The Logic final is difficult.
Explanation q	=	My classmate did not study (the logic final was fair).

In the case that your classmate is his normal self, that he studied, and his grades are similar to yours, that p, *The logic final is difficult* is the best-fit explanation for why your fellow classmate would assert p. If for some reason you find that your classmate failed to study (at the time he asserted p, he violates Quantity by failing to inform you of this additional fact) then p is not the best-fit explanation for why he asserted p (q is). Similarly, if this assertion came from a student who routinely struggled, then even though this student's assertion is sincere (he believed that the test was difficult), that p is true is not necessarily an explanation for why the student asserted p.[71]

3.7.5 Modeling the Best-fit Explanation

What constitutes a *best-fit explanation* in terms of the evidential still requires explanation. We do not want the proposal here to fall prey to the same complaints that were raised by critics of Faller's *Best possible grounds*. In order for a proposition to be a best-fit explanation by abductive reasoning, we expect it to have the following properties: (i) prior to the observation e, the explanatory proposition p is not part of the agent's background knowledge K_a, (ii) the agent's knowledge is expanded to include e, and p must be an explanation that can account for $K_a + e$, such that assuming p would explain the facts better than assuming $\neg p$, $Pr((K_a + e)|p) > Pr((K_a + e)|\neg p)$, and (iii) any alternative explanation q is often ruled out

[71] Perhaps your classmate asserted p to trick you into excessive studying. Any other proposition other than the one asserted, however, cannot be marked with a reportative evidential. Thus there only needs to be one other possible explanation that would entail $\neg p$ and derive the same facts about the evidence relation relevant to the evidential.

due to the fact that it has an extremely low probability in a default context, which is given by a low frequency of occurrence.

The proposal offered here is by no means complete and should be taken to be a starting place for future research with respect to conditional probabilities and evidential contexts. Several questions with respect to probability values still remain, such that a more accurate account of the best-fit explanation should be possible given further investigation. The following intends to capture why the proposition given as explanation is the one which is made so quickly, easily and economically (with very few inferential steps), and not an argument for how to reflect the abductive reasoning accurately with probabilities.

(284) Best-fit Explanation

In an evidence context C_{EV}, where e is an observation to be explained by an agent a,

(a) There is a proposition p, where

i. p, $\neg p \notin K_a$, and

ii. p is an explanation for e, such that $Pr((K_a + e)|p) > Pr((K_a + e)|\neg p)$

(b) There is a proposition q, where

i. q, $\neg q \notin K_a$, and

ii. p is an alternative explanation for e, such that
$Pr((K_a + e)|q) > Pr((K_a + e)|\neg q)$

Where p is the Best-fit Explanation of e if and only if

(a) $Pr(q)$ is extremely low[72]

(b) $Pr(p) >> Pr(q)$, and

(c) $Pr((K_a + e)|p) >> Pr((K_a + e)|q)$[73]

[72]This is a *default probability*, which is given by general frequencies; this default probability can be overridden by more specific cases, such as in the case of when default probabilities are uninformative.

[73]Computation in Bayes':
$Pr_D(p|(K_a + e)) = \left(\frac{Pr_D((K_a+e)|p)*Pr_D(p)}{Pr_D(K_a+e)}\right) >> \left(\frac{Pr_D((K_a+e)|q)*Pr_D(q)}{Pr_D(K_a+e)}\right) = Pr_D(q|(K_a + e))$

Probability distributions can be redistributed depending on what propositions are included in K_a, and thus probability weights are given by the current context; unless more specific information exists, the agent assumes default priors given by his general knowledge about the world. If new information is added to C, such that the more specific information is added, or that p is ruled out, then probabilities are redistributed and the process to determine the best-fit explanation is repeated with the remaining candidates and their revised values.

Modeling the process of abduction to the best-fit explanation with conditional probabilities is an entire study in and of itself (Lipton 2001). The above is a basic outline for how an agent determines that his explanation is best-fit, which is a step further than what was provided by Faller (2002). Now that we have a general picture the typology of evidence relations, we can now discuss how they are expressed in natural language with evidentials. The diagram in Figure 3.2 summarizes the above discussion and previews how evidence relations and evidentials align, in terms of explanation type of the proposition that the evidential marks.

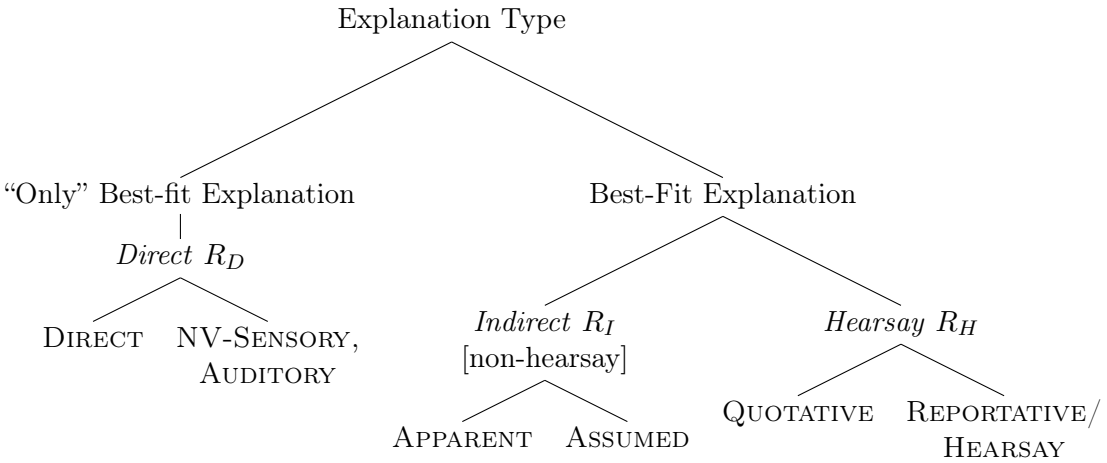

Figure 3.2: Evidence Relations and Evidentials (Preliminary)

As we see in Figure 3.2, the distribution of evidentials seems to be surprisingly even among subtypes, as there are two evidentials per evidence relation type; and we see that there are more types of evidentials than there are evidence relation types.[74] Figure 3.2 above should not be considered to be a completely comprehensive picture of evidence relation types and evidentials, as the data here is limited to Yup'ik and English. In the case that more data with respect to evidentials become available, refinements can be made to accurately reflect all evidential types. I discuss how the evidence relation is expressed by the evidential in the next chapter, and how we refine the proposal given in this chapter in order to capture the differences in the evidence signals of the ASSUMED and APPARENT.

[74]There are other evidential types that are not included here, such as Kashaya's PERFORMATIVE (Oswalt 1986) there is simply not enough available data to determine this type of evidential's place.

Chapter 4

Evidence Expressed: Evidentials

In the previous chapter I proposed that evidentials mark propositions that are inferred by abductive reasoning, the best-fit explanations for speakers' observation (section 3.6.2). I then modeled the evidence signal of the evidential as an evidence relation (section 3.7.1). To review briefly here, evidence is only relevant to speakers in a discourse context that is an evidence context, which is repeated here in (285).

(285) Evidence Context

A context C, composed of a speaker-agent a and interlocutor i, is an evidence context C_{EV}, if and only if

(a) There is a proposition p, such that

i. p is unknown to a;

ii. a assumes that i also does not know p; and

iii. the truth value of p is relevant to the discourse

(b) C_{EV} is a felicitous evidence discourse context if and only if $p \notin K_i$

The basic evidence relation, given in (286), assumes that agents evaluate evidence in an evidence context.

(286) A Basic Evidence Relation $R(a,\ e,\ p)$

In an evidence context C_{EV}, there is an evidence relation of the form $R(a,\ e,\ p)$, that may be expressed by an evidential, if and only if

(a) e is an observation by a, and K_a is expanded to include e ($K_a + e$);

(b) p is the hypothesis which is the best-fit explanation of e, given K_a, in C_{EV}

4.0.6 Specific Evidence Relation Types and Evidentials

In the previous chapter, I proposed that there are three subtypes of the basic evidence relation, the Direct R_D, the Indirect R_I and the Hearsay R_H relations. Evidence relations fall into two major divisions: direct and indirect, which are determined by the degree to which the speaker could be said to be certain that their best-fit explanation p for their observation e is true. In the case of the Direct, the speaker can be said to be certain that his explanation is true, assuming his observation is true. In the case of the Indirect, the speaker still remains to some degree uncertain that his explanation is true, assuming his observation is accurate. A summary of this distinction is given in (287).

(287) The Direct and Indirect Evidence Relations

In an evidence context C_{EV}, an evidence relation is

(a) A **Direct** relation, of the form ($R_D(a,\ e,\ p)$), if and only if

i. a is *certain* that p, as

ii. p is the best-fit and only fitting explanation of $K_a + e$, given that $K_a + e$ does not include false assumptions with respect to C that would make e false.

(b) An **Indirect** relation, of the form ($R_I(a,\ e,\ p)$), if and only if

i. a remains uncertain that p, as

ii. p is the best-fit explanation but <u>not</u> the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C_{EV} that would make e false.

The relation between the direct evidence relation and the DIRECT evidential, and the indirect evidence relation and the APPARENT evidential are straightforward, and follows

directly from the discussion in the previous chapter (section 3.7). Examples of typical direct and indirect evidence contexts are repeated in (288).

(288) Direct and Indirect Evidence Relation Contexts

(a) **Evidence Relation: Direct$_1$ (Witnessing)**

The agent witnesses one car hit another car.

Observation(s) e = Seeing the car hit another car; the result of damaged cars

Explanation p = There was an accident.

(b) **Evidence Relation: Direct$_2$ (Non-visual Sensory)**

The agent feels a cashmere sweater, and notes that it is indeed soft.

Observation(s) e = Touching the sweater; the sweater feels soft

Explanation p = This sweater is soft.

(c) **Evidence Relation: Indirect$_1$ (Observable Facts)**

The agent sees black smoke emanating from a specific location.

Observation(s) e = Seeing black smoke emanating from a specific location

Explanation p = A building is on fire.

Explanation q = An angry woman has defenestrated all her husband's belongings and has set them ablaze in an alley.

Direct evidentials express that a speaker has a direct evidence relation. The direct evidence scenarios in (288a - 288b), in a true evidence context, then the speaker relays p as his best-fit explanation of e, and he is certain that p is true, given e is true, a direct evidence relation R_D, which he marks with a direct evidential. Inferential evidentials [of the apparent type] express that the speaker has an indirect evidence relation. In the indirect case of (288c), the speaker relays p as the best-fit explanation of e, although in this case he is still not completely certain. In this case the speaker marks a relation of the R_I type with an inferential apparent evidential. The alignment of the assumed and evidence relation is more complicated, and requires further explanation, and is the subject of the next section.

The hearsay evidence relation is an indirect evidence relation R_I, that simply carries a further specification on the form of the observation e, that it is a previous assertion. This provision is given in (289) below. The motivation for modeling the hearsay evidence relation as its own relation, instead of simply a subtype of an indirect evidence relation, is due to the fact that the proposal here concerns evidential expressions explicitly, and this distinction is expressed linguistically.[1] Unlike many of the previous analyses (Faller 2002; McCready & Ogata 2007; Murray 2010), the hearsay relation is not argued to be distinct from other evidence relations in terms of its strength.

(289) Specified Indirect Relation: Hearsay

In an evidence context C_{EV}, an evidence relation is **Hearsay** and of the form $R_H(a, e, p)$, if and only if

(a) e is the observation of a prior assertion of p, by an original speaker O in a cooperative context C, such that

i. $O \notin \{a, i\}$, and

ii. O's assertion of p is believed by a to be sincere and well-grounded;[2]

(b) a remains uncertain that p, as

(c) p is the best-fit explanation but <u>not</u> the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C that would make e false.

Reportative/hearsay and quotative evidentials express that a speaker has a hearsay evidence relation. While the cases of the hearsay evidence relation are not exclusive to the reportative/hearsay and quotative evidentials (e.g., evidence promotion),

[1] This may not be the only evidence relation that may require further sub-specification on the observation e. This may also be necessary for any evidentials that seem to refer specifically to a sensory mechanism, such as auditory. I do not propose a semantics for the auditory evidential, because I do not have novel data available that could either support or refute any claim made here.

[2] O believes p to be true, or at least O has the appearance of believing p to be true.

when a proposition is marked with a REPORTATIVE/HEARSAY or QUOTATIVE evidential, then the speaker indicates that they have abductively inferred that p is true based on the fact that p was at some point felicitously asserted, such as in the example context in the hearsay evidence case repeated below.

(290) **Hearsay**

Your classmate told that you that the Logic final was a doozy

Observation e	=	Your classmate's assertion that the Logic final was difficult, "a doozy".
Explanation p	=	The Logic final is difficult.
Explanation q	=	The Logic final is fair.

That p is true is the best-fit explanation for why someone would sincerely assert p. There are cases where REPORTATIVE/HEARSAY and QUOTATIVE evidentials mark propositions that were asserted, but the assertion was in some way insincere. I discuss the different cases of hearsay evidence in section 4.5.

The relations given here are the basic evidence relations that are expressed by evidentials. Some evidentials may require additional specification on these basic evidential relation types. In this chapter I illustrate how the evidence relation approach explains the more complicated uses of evidentials, and provides additional insight into the semantics and taxonomy of evidential expressions.

4.1 Revising Initial Evidence Relations: Assumed and Apparent Evidentials

In Figure 3.2, it was initially proposed that the two types of inferential evidentials the APPARENT and the ASSUMED both express an indirect evidence relation R_I. This is not entirely accurate; the indirect evidence relation R_I must be modified to capture the case of the ASSUMED. Source type analyses of evidentials describe the difference in evidence signals between the two evidentials as observable result in the case of the APPARENT and general knowledge would suffice in the case of the APPARENT.

An example of this type of proposal is Matthewson et al.'s (2007) proposal for St'át'imcets, which has both a perceived evidence, APPARENT evidential modal *-an'* and an inferential, ASSUMED evidential modal *k'a*. In order to illustrate how these two differ in their evidence signal, Matthewson et al. provide a variation of the drunken-wine scenario in (291-292). According to Matthewson et al., the cases in which *-an'* is permissible are a subset of those where *k'a* is. We see *-an'* is only felicitous in one evidence scenario, but *k'a* is felicitous in both. Matthewson et al. (2007) argue that for *-an'* to be felicitous (292) there must be observable "perceived evidence", which explains the infelicity of *-an'* in (291).

(291) GENERAL KNOWLEDGE

Context: You had five pieces of *ts'wan* (wind-dried salmon) left when you checked yesterday. Today you go to get some *ts'wan* to make soup and you notice they are all gone. You are not sure who took them, but you know that John is the person in your household who really loves *ts'wan* and usually eats lots whenever he gets the chance.

(a) *ts'aqw-an'-ás* ***k'a*** *i* *ts'waá* *kw* *s-John*
eat-DIR-3SG INFER DET.PL *ts'wan*-EXIS DET NOM-John
'John must have eaten the *ts'wan*.'

(b) ?? *ts'aqw-an'-ás-**an'*** *i* *ts'waá* *kw* *s-John*
eat-DIR-3SG-PERC.EVID DET.PL *ts'wan*-EXIS DET NOM-John
'John apparently ate the *ts'wan*.'
Consultant's comment re (b): "[Good] if he has bits of *ts'wan* on his shirt."

(292) OBSERVABLE RESULTS

Context: Same as the above, except that this time, it's not just that you think it must be John because he's the one who likes *ts'wan*. This time, you see the *ts'wan* skins in his room.

(a) *ts'aqw-an'-ás* ***k'a*** *i* *ts'waá* *kw* *s-John*

eat-DIR-3SG INFER DET.PL *ts'wan*-EXIS DET NOM-John

'John must have eaten the *ts'wan*.'

(b) *ts'aqw-an'-ás-**an'*** *i* *ts'waá* *kw* *s-John*

eat-DIR-3SG-PERC.EVID DET.PL *ts'wan*-EXIS DET NOM-John

'John apparently ate the *ts'wan*.'

(Matthewson et al. 2007: 207-208)

The problem with the description of "perceived evidence" in the one case and not the other is that in both cases there is observable, perceived evidence of surreptitious *ts'wan* consumption, the missing *ts'wan*. The missing *ts'wan* is an observable result of someone having consumed the *ts'wan*; a set of possible *ts'wan*-eaters is given in (293). The missing *ts'wan* could be attributed to any one of these individuals, although it John may be the more likely candidate, given what you know.

(293) Possible Ts'wan Culprits

(a) John, the *ts'wan* lover

(b) Mary, the *ts'wan* liker

(c) Diggy, the blind, toothless dog who swallows *ts'wan* whole

We must also distinguish the two scenarios in terms of what is known and what is observed in each. First, let us define the set of known propositions.

(294) Initial Speaker-Agent Knowledge Set

K = {John loves *ts'wan*, Mary likes to snack on *ts'wan*, Diggy sometimes steals "people" food}

The evidence, in each case, is that which is observed.

(295) (a) Observations in General Knowledge Case C_{GK}

In C_{GK}, e_{gk} = Whole pieces of *ts'wan* are missing.

(b) Observations in Perceived Evidence Case C_{PE}

In C_{PE}, e_{pe} = (i) Whole pieces of *ts'wan* are missing, *and*

(ii) There are *ts'wan* skins in John's room.

In C_{GK} there is nothing given by the observation and your knowledge ($K + e_{gk}$), that makes John the more probable culprit than any of the others. In this case, that which can be inferred from $K + e_{gk}$ is that which can be inferred from K. In this case, the other explanations do not require adding more assumptions to explain e_{gk}, they are simply just less likely given K or $K + e_{gk}$. As discussed in the previous chapter, this type of reasoning does not reflect an inference to a single, best-fit explanation; here we have an inference that seems be to a *good-fit* explanation.

In the case that there are *ts'wan*-skin flecks on John's shirt, however, there is an additional observation which must be explained. This piece of additional evidence does not preclude the others' guilt, but to explain what you observe given what you know ($K + e_{pe}$), *John ate the ts'wan* requires the fewest additional assumptions. In this case the addition of e_{pe} does increase the probability that John is the culprit, in order to argue that Mary is the culprit, requires too many additional assumptions that must be made (e.g., she was wearing John's shirt while eating the *ts'wan* in order to frame him). This type of reasoning is not economical and violates Occam's Razor and Peirce's Principle of Economy.

4.1.1 Revising Evidence Relations for Evidentials

The two inferentials seem to express two different types of relations. First, let us propose an initial distinction between the apparent and assumed in terms of their explanation type.

(296) Inferential Evidentials in Terms of Explanation Types

Apparent:

An expression of an evidence relation, such that the abductive inference is to the

best-fit explanation based on default probabilities, a true **best-fit** explanation for the observation

ASSUMED:

An expression of an evidence relation, such that the abductive inference is to a personal best-fit explanation, a **good-fit** explanation for the observation, in cases where default probabilities are uninformative

Where **good-fit** is given by the number of other viable fitting explanations; in the case of the good-fit explanation, the alternative explanations are quite as rare as in those cases of the true best-fit. Another way to say this is that a good-fit explanation is a best-fit explanation that is determined to be best-fitting by more personal means. In this case the default probabilities are such that they are uninformative in terms of what would be best-fit. In this case, the speaker uses personally-determined probabilities to determine what is best-fit, rather than what seems to be default, shared probabilities. Since the choice of the best-fit in this case is a personal choice, what is determined to be the best-fit in these cases can vary from speaker to speaker, whereas such variation is not found in cases when there is a true best-fit explanation. This distinction between a normal best-fit of the APPARENT and a personal best-fit (a good-fit) of the ASSUMED is given in (297).

(297) BEST-FIT VERSUS GOOD-FIT EXPLANATION

In an evidence context C_{EV}, where e is an observation to be explained by an agent a, where

(a) There is a proposition p, where

i. p, $\neg p \notin K_a$, and

ii. p is an explanation for e, such that $Pr((K_a + e)|p) > Pr((K_a + e)|\neg p)$

(b) There is a proposition q, where

i. q, $\neg q \notin K_a$, and

ii. p is an alternative explanation for e, such that

$Pr((K_a + e)|q) > Pr((K_a + e)|\neg q)$

Where probabilities associate with p and q are given a default value (PR_D), as they are shared by all discourse participants,

- p is the **best-fit** explanation of e, if and only if,
  (a) $Pr_D(q)$ is extremely low,
  (b) $Pr_D(p) >> Pr_D(q)$, and
  (c) $Pr_D((K_a + e)|p) >> Pr_D((K_a + e)|q)$
- Otherwise, p is personal best-fit, or **good-fit**, explanation of e if and only if,
  (a) $Pr_D(q)$ is not extremely low,
  (b) $Pr_D(p) \geq Pr_D(q)$, and
  (c) $Pr_D((K_a + e)|p) \geq Pr_D((K_a + e)|q)$[3]
  And p is determined to be the best-fit explanation wrt K_a (which may differ from K_i) where,
  (d) $Pr_{K_a}(p) > Pr_{K_a}(q)$, and
  (e) $Pr_{K_a}((K_a + e)|p) > Pr_{K_a}((K_a + e)|q)$[4]

The facts of the ASSUMED evidential require that we revise our original three subtypes of evidence relations to include a forth, R_{SI}, which is an indirect type of evidence relation with what appears to be a weaker best-fit explanation, because it is not the same that would be determined by all discourse participants.

[3]Computation in Bayes':
$Pr_D(p|(K_a + e)) = \left(\frac{Pr_D((K_a+e)|p)*Pr_D(p)}{Pr_D(K_a+e)}\right) \geq \left(\frac{Pr_D((K_a+e)|q)*Pr_D(q)}{Pr_D(K_a+e)}\right) = Pr_D(q|(K_a + e))$

[4]Computation in Bayes':
$Pr_{K_a}(p|(K_a + e)) = \left(\frac{Pr_{K_a}((K_a+e)|p)*Pr_{K_a}(p)}{Pr_{K_a}(K_a+e)}\right) > \left(\frac{Pr_{K_a}((K_a+e)|q)*Pr_{K_a}(q)}{Pr_{K_a}(K_a+e)}\right) = Pr_{K_a}(q|(K_a + e))$

(298) The Subjective Indirect Evidence Relation $R_{SI}(a,\ e,\ p)$

In an evidence context C_{EV}, an evidence relation is **Subjective Indirect**, and of the form $R_{SI}(a,\ e,\ p)$, if and only if

(a) a uses personal means to determine that p is best-fit, and i may not agree with a wrt the choice of p as best-fit, given the same background information, and

(b) a remains uncertain that p, as

(c) p is the personally-determined best-fit explanation but <u>not</u> the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C_{EV} that would make e false

We have added a new relation, and thus the original tree of evidence to evidentiality in Figure 3.2 in the previous chapter must be revised. The revised tree in Figure 4.1, is updated, and includes three types of "explanations": *best-fit only* (direct), true *best-fit* (indirect and hearsay), and personal best-fit, *good-fit* (subjective indirect).

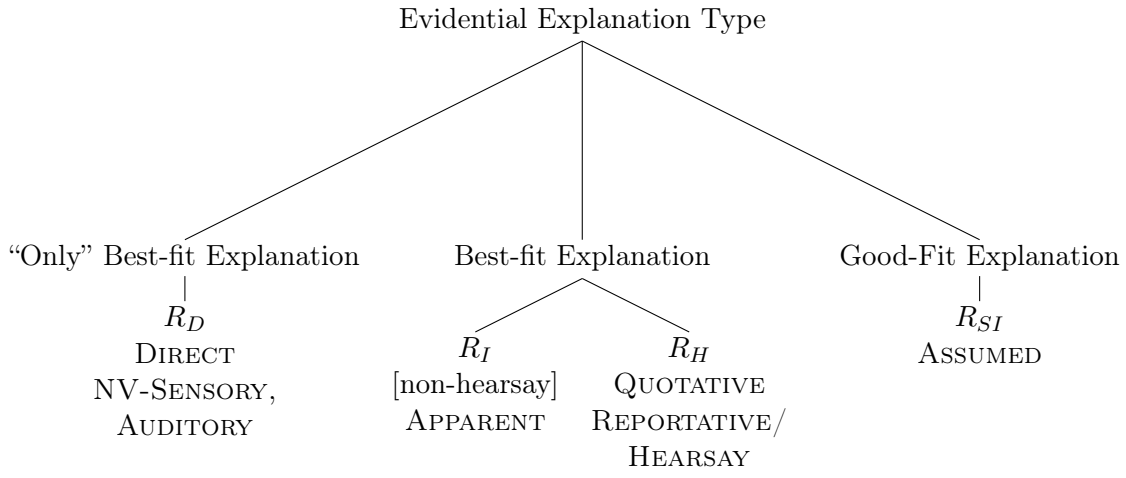

Figure 4.1: Evidence Relation Types and Evidentials (Revised)

4.1.2 Some Consequences of the Good-Fit Explanation

In section 3.6.2, I discussed how abduction, an inference to the best-fit explanation explains the infelicity of the APPARENT evidential in the case of the Drunken Wine case, as well as the Lost Keys, Gross Food, and Shell Game scenarios. I have repeated the table summarizing these cases below in Table 4.1.

Scenario		*Description*	*Evidential*
Drunken Wine		The speaker has been keeping wine bottles in his office, but discovers that bottles are missing from the box.	
	A	You know John likes wine.	Assumed (# Apparent)
	B	You know John likes wine *and* you find empty wine bottles in John's office.	Assumed; Apparent
Lost Keys		The speaker has misplaced his keys, he has looked multiple places without success, and infers that they are in his car.	Assumed (# Apparent)
Shell Game		The speaker is told that a coin is hidden under one of the three shells. He has been shown it is not under two of the shells. He infers that it is under the third.	Assumed (# Apparent)
Gross Food		The speaker walks by a restaurant window and sees a plate of food that looks unappetizing. He infers that it tastes disgusting.	Assumed (# Apparent)

Table 4.1: The Apparent-Assumed Distinction

I refer the reader to the arguments that were provided in section 3.6.2, where it was argued that the infelicity of the APPARENT can by captured by the fact that there is no best-fit explanation for the observation, and that the above are not examples of abduction.

The argument given in the previous chapter creates a problem for my proposal for the semantics of the ASSUMED. The ASSUMED evidential is felicitous in the above cases, which I had argued were not cases of abductive inference. This is illustrated with the proposed English ASSUMED evidential, *presumably*.

(299) Non-Abductive Context, Felicitous Evidential

(a) Drunken Wine

The speaker has been keeping wine bottles in his office, but discovers that bottles are missing from the box, and

(A) knows John likes wine.

Presumably John drank the wine.

(B) knows John likes wine and finds empty wine bottles in John's office

Presumably John drank the wine.

(b) Lost Keys

The speaker has misplaced his keys, he has looked multiple places without success, and infers that they are in his car.

Presumably my keys are in my car.

(c) Shell Game

The speaker is told that a coin is hidden under one of three shells, and he has been shown it is not under two shells, and infers that it is under the third.

Presumably it is under the third one.

(d) Gross Food

The speaker walks by a restaurant window and sees a plate of food that looks unappetizing, and he infers that it would taste disgusting.

Presumably that tastes disgusting.

The assumed evidential is felicitous for all indirect inferential reasoning types: abduction, induction and deduction alike (see section 3.6.2), but the proposal here claims that the assumed actually expresses a case of weak abductive inference, such that the explanatory proposition is only a good-fit explanation, where a good-fit explanation is such that the other possible explanations are not so improbable in comparison to the explanation chosen. The evidential signal seems to be less sensitive than the apparent, as the assumed evidential

is permissible in cases where the APPARENT is as well, and Matthewson et al. (2007) go so far as to argue that the cases of the APPARENT are a proper subset of the cases of the ASSUMED.

An alternative approach to that which has been proposed here for the semantics of the ASSUMED would be argue that the ASSUMED is non-evidential because it does not fit the initially-proposed evidence relations. We have many examples for how the inferential APPARENT evidential behaves distinctly from the epistemic modal *must*, as *must* was felicitous in the Lost Keys, Gross Food, and Drunken Wine cases, but the APPARENT was not. We do not see, however, any arguments which illustrate how the ASSUMED differs from epistemic modals such as *must* or *might* (all cases where *presumably* is felicitous, *must* is as well). The proposal given here also does not have any arguments to offer here with respect to how the evidence signal of the ASSUMED differs from that of the epistemic modal; this may be an issue for future investigation.[5]

We argued here that if the ASSUMED does express abductive inference, but a personal best-fit explanation, where given equivalent background knowledge, all other discourse participants i may not determine the same best-fit as a does. In this case, the abductive inference seems weaker, and we call this a good-fit to distinguish it from the best-fit that is expressed by the APPARENT (and the REPORTATIVE/HEARSAY and QUOTATIVE evidentials). This argument captures the fact that the ASSUMED, also referred to as the CONJECTURAL, is always ranked lower in evidential hierarchies than the APPARENT. I have repeated Faller's (2002) and Barnes' (1984) evidential hierarchies, and also added De Haan's (1998).[6]

[5]Faller (2002) and Murray (2010) both argue that the inferential evidentials in Cuzco Quechua and Cheyenne, both CONJECTURAL/ASSUMED types of evidentials, are modals; Faller argues that CONJECTURAL/ASSUMED occupy the locus of overlap between the linguistic category of evidentiality and the category of modality. In terms of the evidential nature of the ASSUMED there is not much data that supports why it should be included as an evidential, but there is also not enough evidence to support the removal of the ASSUMED from the category of evidentiality.

[6]Oswalt's (1986) hierarchy for Kashaya is not relevant here because there is no ASSUMED evidential in Kashaya.

(300) Evidential and Evidence Hierarchies

(a) Barnes' (1984) Evidential Hierarchy (*Tuyuca*)

Visual > Nonvisual > Apparent > Secondhand > Assumed

(b) De Haan (1998) Evidential Hierarchy

Visual > Auditory > Other Sensory > Inference > Secondhand > Thirdhand > Assumed

(c) Faller (2002) Personal Evidence Cline (*Cuzco Quechua*)

Performative > Visual > Auditory > Other Sensory > Inference from Results > Inference from Reasoning > Assumption

(Faller 2002: 70)

In the case that the speaker has a normal (objective) best-fit explanation for observation e, then they have two options, depending on the form of observation e. In the case that the observation is previous assertion, then the speaker marks the best-fit explanation with the reportative/hearsay evidential (or the quotative evidential if he chooses to indicate the speaker). Otherwise, he uses the apparent. Note that reportative and apparent evidentials are difficult to rank in an evidential hierarchy, and thus Faller (2002) proposes the split evidential hierarchy. Proposing that reportative and apparent inferential evidentials are two sides of the same coin also may help in explaining why some apparent evidentials, such as English *evidently* and *apparently* and evidential perfects (e.g., Bulgarian, Turkish), can alternatively take on a hearsay interpretation. We do not see this alternation with the assumed; the hearsay interpretation does not arise when a proposition marked with *presumably* is subsequently denied; it is simply infelicitous, as illustrated in (301).

(301) Non-Derivable Hearsay Interpretation of the Assumed

(a) Subsequent Negation

Presumably John won, but I don't believe it.

(cf. Evidently/Apparently John won, but I don't believe it.)

(b) Overt Indication of Hearsay Evidence

I heard the weather report this morning; presumably it hailed in Dallas yesterday. (cf. I heard the weather report this morning; evidently/apparently it hailed in Dallas yesterday.)

As mentioned previously, Matthewson et al. (2007) argue that the cases where St'át'imcets evidential modal APPARENT *-an'* are felicitous are a proper subset of those case where the ASSUMED *k'a* are. We do not argue this for English. The above example indicates that the evidence signals of the APPARENT and the ASSUMED are different, one is determined by default, where all members of the discourse would chose similarly, the other is such that not all discourse participants would agree. There may be a number cases of overlap, but the overlap between these two evidentials is not complete.

4.2 Evidence-Evidential Mismatch Cases and the Inferential (Apparent) Evidential

The above discussion explains in a very broad way how the evidence relation proposal can be applied to normal evidence scenarios. In this section I discuss the evidence mismatch cases and non-literal uses of evidentials.

4.2.1 Evidence-Evidential Mismatch: The Mirative Use of the Apparent Evidential

Mirativity is the grammatical marking of speaker surprise or unexpected or new information (DeLancey 1997, 2001; Aksu-Koç & Slobin 1986). Mirativity is described here as EVIDENCE DEMOTION, due to the fact that a speaker marks a direct evidence relation with an indirect evidential. In normal cases, this act should be infelicitous, given the condition on inferential evidentials that a speaker cannot have directly witnessed an event. The inferential APPARENT evidential, in the case of the mirative, however, is not infelicitous. It is only inferentials of the APPARENT type that seem to be able to take on a mirative interpretation; ASSUMED

evidentials, such as the Cuzco Quechua *-chá*, do not have a mirative extension.[7] Whether the interpretation of the APPARENT is an evidential or a mirative one, depends on the context of utterance. This illustrated in (302).

(302) TWO INTERPRETATIONS OF THE APPARENT

Evidential (R_I)

The speaker feels heat or sees smoke

(but does not see the fire itself)

*ekua-lria-rtangqer-**llini**-uq*

fire-PART-for.there.to.be-INF-IND-3SG

'Evidently there's a fire.'

Mirative (R_D)

The speaker actually sees the fire

A focus of previous work on mirativity and evidentiality has been to determine whether mirativity is a category in its own right, separate from evidentiality (DeLancey 1997, 2001; Dickinson 2000; Peterson 2010; Flaten 2009; see discussion section 3.2.1). Only recently have more formal approaches to mirativity appeared, as the majority of the work on mirativity has been primarily descriptive.

PETERSON'S (2010) IMPLICATURE-BASED ACCOUNT OF THE MIRATIVE

Peterson (2010) gives a Gricean account for the mirative use of the sensory/inferential Gitksan evidential *ńakw*. Gitksan *ńakw* and Yup'ik *llini* seem to behave quite similarly. According to Peterson, the use of the evidential *ńakw* carries with it the presupposition that the speaker has sensory evidence for the proposition expressed with *ńakw*, or what he refers to as a "*ńakw*-assertion" (2010: 142).[8]

Similar to Yup'ik *llini*, English *apparently/evidently* and perfects of evidentiality, Gitksan *ńakw* can also take on two interpretations depending on the context of utterance, either

[7]There is some discussion that in Wanka Quechua, the reportative evidential can be used as a mirative (Floyd 1999); Faller (2002) reports that this is not the case for the Cuzco Quechua reportative *-si*.

[8]Peterson doesn't provide a formal semantics for the Gitksan evidential *ńakw* in this particular paper.

inferential evidential interpretation or a mirative one. The following is taken directly from Peterson.

(303) ***ńakw=hl*** *witxw=t* *John*

EVID=CND arrive=PND John

'John must be here' / 'Looks like John's here'

(a) *Non-mirative/Evidential*

PRESUPPOSITION: The speaker has indirect sensory evidence of John's presence (i.e. his pick-up in the driveway; you can hear loud music playing inside his house).

ASSERTION: John is here.

(b) *Mirative*

PRESUPPOSITION: The speaker has indirect sensory evidence

(John is standing in the doorway; his pick-up in the driveway; you can hear loud music playing inside his house).

ASSERTION: John is here.

(Peterson 2010: 142-143)

According to Peterson,

> In a statement of the form $EV(p)$, where p is the proposition associated with the evidential (EV), a speaker cannot know for certain p is in fact true. If a speaker knows p is true, then we expect Gricean considerations to ensure that a speaker assert p, and not $EV(p)$. A mirative statement results from when a speaker knows $EV(p)$ is in fact true. *Under this view, a mirative statement doesn't assert something new because* p *is already a part of the common ground, and this is what results in implicature.* (Emphasis my own.)

(Peterson 2010: 133)

In the scenario given above, p = *John is here*. For the mirative case, Peterson proposes that the following propositions listed in (304) are in the common ground (CG). The propositions Peterson includes in the CG, and those propositions that Peterson assumes are in the common ground are not equivalent. Specifically, the proposition which Peterson assumes to be part of the common ground p = *John is here*, is actually not in the CG as provided by Peterson in (304).

(304) The Composition of the CG

CG = {the proposition that John is standing in the doorway; the proposition that John's pick-up is in the driveway; the proposition that there is loud music playing inside his house; etc...}

(Peterson 2010: 143)

Peterson's discussion assumes that the two propositions p = *John is here* and q = *John is standing in the doorway* are the same, and it is true that q should entail p. Recall from the discussion in the previous chapter (section 3.3.1), that perception data and knowledge are not one in the same; the mirative highlights this very point. A speaker who relays his direct evidence with an indirect evidential must assume that something in the context is faulty, such that he momentarily does not believe his own eyes. The CG as constructed in (304), obscures this process.

Peterson claims that the speaker flouts the maxim of Quantity by being "too informative", due to the fact that he asserts something already in the common ground.[9]

[9]It is not clear how this differs from the normal evidential use, because here also the speaker may be asserting a proposition already in the common ground, as all the evidence propositions (*the proposition that John is standing in the doorway; the proposition that John's pick-up is in the driveway; the proposition that there is loud music playing inside his house; etc*) are in the common ground. Why then, is the evidential here not overly informative as well? Without the parameter of the speaker's mind, or a more concrete notion of evidence, we are unable to draw out how one determines evidence in context. Further, if all those propositions are taken to be evidence of p by all participants, then the evidential assertion should also be overly informative.

(305) Peterson's (2010) Proposal

(a) In asserting *EV(p)*, the Speaker does not know if p is true or false:
Evidential without any implicated meaning

(b) In asserting *EV(p)*, the Speaker knows p is true:
Mirativity as Quantity implicature

(Peterson 2010: 133 [Emphasis mine])

Peterson argues that by flouting Quantity with the evidential, the speaker intends to implicate something other than his knowledge that p is true. Flouting Quantity does not seem to derive the surprise meaning of the mirative in particular, as the speaker could be overly informative for a number of reasons.[10] It is also not clear why it is the indirect evidential that takes on the mirative reading. A simple assertion of p in this case, which also flouts Quantity, does not have a mirative interpretation (2010: 142).[11]

Flouting the maxim of Quantity by itself does not provide any further insight into why it is that the inferential APPARENT evidential is used to express the mirative. It is not only that the speaker seems to be asserting something that is presumed to be in the common ground, but that he asserts it using an indirect evidential instead of something more direct, given his evidence. Peterson does not discuss the evidence-evidential type mismatch problem, why the speaker uses an inferential evidential when he should have use a direct (Flaten 2009), nor does Peterson's proposal account for why only APPARENT types of inferential evidentials give rise to mirative readings.

[10]It is not the case that only the surprise meaning is derivable by flouting. The speaker could express just simple disbelief (e.g., hallucinating) or even anger (for example, imagine you had plans to meet up with John, but you've been calling him and he's not answering calls or texts).

[11]Peterson notes that in English, Quantity is flouted with the exclamation *p!*, but the same does not hold for Gitksan (Peterson 2010: 142). Without the exclamation however, there are more possibilities than a surprise meaning as well. One can imagine by saying *John's here* the speaker could be saying something like *Oh this is going to be epic* or *Oh great, nerd brigade.*

Peterson's intuition that the mirative is a contextually-derived meaning of the evidential seems to be correct. Importantly, the mirative and evidential case differ in two respects: (i) the relation of the evidence to the proposition (the evidence relation in the mirative case is direct (R_D), and in the normal indirect/inferential case the evidence relation is indirect (R_I)), and (ii) the contexts in which they occur (in the normal case, the context is an evidence context; in the mirative case, the context is not an evidence context).[12]

(306) The Mirative, Inferential Evidential and Evidence Relations

Assuming that observation e is true (i.e., not a mirage or illusion),

(a) Normal Evidential Case

$C = C_{EV}$ $(p, \neg p \notin K_a)$

+ Observation e is non-certain [indirect] evidence for p

$\Rightarrow$ Inferential Evidential ($R_I(a,\ e,\ p)$)

(b) Mirative Evidential Case

$C \neq C_{EV}$ $(\neg p \in K_a)$

+ Observation e is certain [direct] evidence for p

$\Rightarrow$ Inferential Evidential ($R_I(a,\ e,\ p)$; ~~$R_D(a,\ e,\ p)$~~)

Both of these conditions conspire to produce the mirative, specifically the surprise element of the mirative. The whole CG in the case of the mirative is unnecessary, as deriving only requires the information in one knowledge set, the speaker's. It is not essential that other interlocutors even be present in order to capture a speaker's surprise.[13] Peterson assumes

[12]Flaten (2009) also proposes an analysis which aims to capture Aksu-Koç & Slobin's (1986) notion of the "unprepared mind" using Veltman's (1996) update semantics. Flaten proposes that the difference between Turkish *-miş* and *-dI* in the case of direct evidence in the mirative (*-miş*) case reflects a revamping of a speaker's information state, where worlds that he considered to be non-optimal are now optimal ones. In fact, the proposal here is very similar in spirit to Flaten's. While Flaten argues that the effect of the change is evidential, he does not explain why it is the inferential evidential, or the APPARENT evidential in particular, that expresses the mirative.

[13]Although a presupposition failure will arise if $R(a,\ e,\ p)$ is not consistent with the CG. For example, if Ben were to claim *Apparently John is home* pointing to John's truck, it would result

that the relevant knowledge set is CG, and this assumption prohibits Peterson's analysis from accessing the surprise meaning of the evidential.

To construct the context, we assume it consists of two agents, Ben and Phil, whose respective knowledge sets are expressed as K_B and K_P. K_B and K_P differ with respect to one relevant proposition *p, John is home*. Ben believes p to be [at least] possibly true (or $\Diamond p$), but does not know for certain. Phil believes $\neg p$, *It's not the case that John is home*, due to the fact that John told him he wouldn't be.[14] For this particular case, we add an additional parameter of time t; beliefs with respect to p in K_B and K_P are held at t_1, a time prior to the acquisition of evidence, t_e. A summary of this is given in (307).

(307) THE STATUS OF p WRT K_{B}, K_{P}

In a context C, at time t_1, ($t_1 < t_e$)

(a) $\Diamond p \in K_{\mathrm{B}} \Rightarrow C = C_{EV}$

(b) $\neg p \in K_{\mathrm{P}} \Rightarrow C \neq C_{EV}$

The composition of CG is the intersection of K_B and K_P ($K_{\mathrm{B}} \cap K_{\mathrm{P}}$). In CG, there are several propositions, that are available to both agents, but the task of determining whether or not any of these propositions are evidence for the proposition *John is home* is only relevant for Ben.[15] In the example below, propositions that directly follow from true observations are in brackets.

(308) $\mathbf{K}_{B_{t_1}}$ = {John's pick-up is in the driveway; There is loud music playing inside his house; The lights are off in John's room, It's possible John is home; John leaves lights on in those rooms he doesn't occupy; John has a roommate}

in a presupposition failure, where we could argue that the presupposition is either (i) the truck is evidence, or more likely– and more to the heart of the matter, (ii) that Phil also believes that it's possible John is home. Thus, it would highlight that $\Diamond p$ is not in the common ground, or $\{K_B \cap K_P\}$. To wit, Phil would respond: *Huh? He got a ride to his race this weekend.*

[14]Here we assume that Phil takes John's assertion to be direct evidence that he is not home, and thus assumes $\neg p$ is true.

[15]Note: I assume knowledge sets are composed of propositions, and drop Peterson's "the proposition that" for the remainder of the discussion. I only include relevant propositions, this is by no means their complete knowledge sets.

(309) $\mathbf{K}_{P_{t_1}}$ = {John's pick-up is in the driveway; There is loud music playing inside his house; The lights are off in John's room; John said he would not be home [**John is not home**]; John has a roommate; John leaves lights on in those rooms he doesn't occupy; John sometimes carpools to races }

The propositions in (309) are not relevant evidence for Phil. At t_1, the status of p with respect to K_B or K_P is unchanged. At time $t_2 = t_e$, the time of evidence acquisition, Phil knocks on John's door, and John answers. Here Phil is surprised, he held $\neg p$ as true, but it looks like p is the case. Time t_3 is the moment of the initial inference, and for the observation *e, John is standing in the doorway*, the best-fit explanation is the only fitting explanation for *p, John is home*. In a normal evidence context ($C = C_{EV}$), *John is home* should be added to K_P and K_B.

(310) $\mathbf{CG}_{t_3}$ = {John is standing in the doorway [**John is home**]; the proposition that John's pick-up is in the driveway; the proposition that there is loud music playing inside his house; The lights are off in John's room; John has a roommate; John leaves lights on in those rooms he doesn't occupy; John sometimes carpools to races}

At t_3, Ben easily updates K_B to $K_B + p$ (he has a direct evidence relation in C_{EV}). Phil's update, however, is not effortless; he is now faced with direct evidence for a proposition he believed to be false ($C \neq C_{EV}$). Phil is forced to revise his knowledge set, as at t_3, Phil's knowledge set is incoherent, holding two contradictory beliefs (311).

(311) $\mathbf{K}_{P_{t_3}}$ = { *John is standing in the doorway* [**John is home**]; John's pick-up is in the driveway; There is loud music playing inside his house; The lights are off in John's room; *John said he would not be home* [**John is not home**]; John has a roommate; John leaves lights on in those rooms he doesn't occupy; John sometimes carpools to races }

Due to the structure of K_{P_t3}, Phil is not capable of asserting p. The direct evidence relation is blocked due to the fact that the context $C \neq C_{EV}$ ($\neg p \in K_P$). The fact that the

evidence relation given by the observation is a direct evidence relation R_D can override Phil's previous assumption of $\neg p$, that is, Phil revises his knowledge set by removing, by contraction, $\neg p$ from K_P and expanding K_P to include p. The operations of expansion, contraction and revision in terms of Belief Set Theory are defined below (AGM 1985; Gärdenfors 1988, 1992).

(312) Belief Set Operations

(a) **Expansion**: $K{+}p = \mathrm{Cn}(K \cup \{p\})$

The addition of a new proposition p to the belief set K. It removes nothing from K, and does not require that the addition of p to K be consistent.

(b) **Contraction**: $K \div p = K \perp p$

The process of removing a proposition p from a belief set K, which: should (i) be minimal; (ii) be performed only when forced; and (iii) affect the density of K in the least amount possible.[16] The outcome of contracting p from K should be a MAXIMAL SUBSET of K, or the subset from which no elements have been removed unnecessarily, but still does not imply p, which is the *Remainder Set* $K \perp p$.

(c) **Revision**: $K^{*}p = (K \div \neg p){+}p$

The operation is an expansion p to the belief set K, which may require a contraction of another proposition from K in order to maintain a coherent knowledge set.

The process describes above is represented timeline form in Figure 4.2.[17]

[16]The Gärdenfors postulate, *Recovery* states that everything that is lost can be regained by re-inclusion. It should be noted that *Recovery* is likely the most problematic of the Gärdenfors postulates (see Hansson 2006).

[17]It may be more accurate to describe the context, where one has assumed knowledge, as: p, $\neg p \notin K$ and $Pr(p) \leq Pr(\neg p)$

Time	$\leftarrow t_1 < t_e$	$t_2 = t_e$	$t_3 = Moment > t_e$	$t_4 \rightarrow \ldots$
Updates to $\mathbf{K}_{Phil}$	$\neg p \in K_P$	$K_P{+}e,\ \neg p \in K_P$	$K_P{}^*p\ (K_P{\div}\neg p,\ K_P{+}p)$	$e,\ p{\in}K_P{\perp}\neg p$
Evidence Relation		~~$R_D(P,\ e,\ p)$~~ $\downarrow$ $R_I(P,\ e,\ p)$		$R_D(P,\ e,\ p)$
Expression			$\text{APPARENT}(p)$	p

Table 4.2: Phil's Evidential Surprise, Observations and Evidence in Time

Revision explains Phil's surprise, but this is only half of the story that must be explained with the evidential mirative.

Why the inferential evidential in particular?

The question that remains is why Phil marks the proposition with the APPARENT inferential evidential and does not simply assert the proposition itself, when the latter would produce the same surprise effect (e.g., *John is home!*). In marking the proposition with the inferential evidential, Phil specifies that the has an indirect evidence relation R_I for the proposition. Specifically, if Phil assumes that his observation is true, then the proposition which is the best-fit, but not the only fitting, explanation for Phil's observation *John is standing in the doorway*, is the proposition *John is home*. At time t_e, Phil is not completely certain that p is true given what he observes, since p is not the only fitting explanation. Since Phil does not have an explanation that is the only fitting explanation, he cannot mark the observation as having a direct evidence relation for p. It is not until he has contracted $\neg p$ from K_P, that he can then truly add p, such that $p \in K_P$. In the case that someone were to ask Phil whether or not John is home at some later point after t_3, he most likely will assert the p with a direct evidential or unmarked form.

To summarize, the proposal here argues that the mirative is simply an extended meaning of the APPARENT inferential evidential; that even in the mirative case the evidential retains all of its normal semantics. Particular elements of the context give rise to the surprise meaning. The speaker uses the APPARENT evidential because what he expresses is the best-fit explanation given what he observes, yet he is not completely certain that his best-fit explanation is true. This uncertainty is due to the fact that this explanation is contrary to what he believed to be true. The evidence context and evidence relations model can not only account for the surprise meaning, but also why the inferential evidential in particular is used in the case of the mirative, which was missing from the analyses of both Peterson (2010) and Flaten (2009).

4.2.2 Evidence-Evidential Mismatch: The Metaphorical/Sarcastic Use of the Apparent

In order to derive the metaphorical or sarcastic meaning of the inferential APPARENT evidential, the entire common ground is necessary. Both *evidently/apparently* and *clearly/obviously* can be used to express sarcasm, but I only discuss *evidently/apparently* here. (Discussion of *clearly/obviously* can be found in sections 1.2.1 and 4.4). An example scenario of the metaphorical use of the evidential is a case where a referee at a basketball game has made a series of bad calls. This referee seems to be unaware of some very obvious fouling by one team, the last of which just knocked down your favorite player. You are seated in your team's section, and you hear the following in (313) from the stands.[18]

(313) Evidential Sarcasm

(a) Evidently/apparently the ref is blind!

(b) Clearly/obviously the ref is blind!

Peterson's Implicature-Based Account of the Metaphorical

Peterson (2010) also provides an implicature-based account for how to derive the metaphorical use of the APPARENT (SENSORY) Gitksan evidential *n̓akw*. Where the mirative case was an instance of flouting of Quantity, Peterson's (2010) argument for the metaphorical is that the speaker flouts the Quality, by asserting a known falsity.

(314) (a) In asserting *EV(p)*, the Speaker does not know if p is true or false:
Evidential without any implicated meaning. implicature

(b) In asserting *EV(p)*, the Speaker knows p is false:
Metaphor as Quality implicature.

(Peterson 2010: 133)

[18]It seems that the ASSUMED can be sarcastic as well: *Presumably the ref is blind!*

One issue with Peterson's proposal is one of his assumptions. It is not the case that the speaker asserts p, but EVp. It is also not the case that the speaker knows that EVp is false, as the speaker may very well may have "indirect sensory evidence that $\neg p$ is true." It is also not clear how flouting Quality with the evidential is different from flouting Quality with a non-evidential assertion of the same proposition.

An Evidence Relation Account of the Metaphorical Evidential

We can explain evidential sarcasm in terms of the evidence relation and the semantics of the APPARENT. Using our basketball example in (313), the proposition p, *The referee is blind* is assumed to be false by all discourse participants. In this case, the knowledge set is that of the intersection of all discourse participants, a collective K_{CG}.

(315) Evidential Sarcasm: C, CG and the Evidence Relation

Assuming e is true (i.e., not a mirage or illusion); $K_a \subseteq K_{CG}$

(a) Normal Evidential Case

$C = C_{EV}\ (p \notin K_a)$ +

p is the best-fit but not the only fitting explanation for e

$\Rightarrow$ Inferential Evidential ($R_I(a,\ e,\ p)$)

(b) Sarcastic/Metaphorical Evidential Case

$C \neq C_{EV}(\neg p \in K_{CG})$ +

p is the best-fit but not the only fitting explanation for e

$\Rightarrow$ Inferential Evidential ($R_I(a,\ e,\ p)$)

The non-literal meaning of the evidential arises from its use in a non-evidential context. The semantics of the APPARENT, as it is proposed here, is that it expresses an indirect evidence relation, that the speaker has the best-fit explanation for what he observes, but his explanation is not the only fitting explanation. The best-fit explanation for why someone would fail to observe something so very obvious, right before his very eyes, is that this

someone is blind, but it is not the only fitting explanation– it could be the case that it was actually not a foul (there was no contact), and only appeared as such from a distance. The speaker can abductively infer that *The ref is blind* is the best-fit explanation for what he observes, by suppressing what he knows to be true. It is not the case that the speaker can use the evidential sarcastically and then draw attention to the fact that he knows his inference to be false.[19] That p is known to be false must not be made overt, as the subsequent assertion of $\neg p$ following an utterance of EVp is infelicitous, as shown in (316).

(316) Negation of the False Proposition

(a) # Evidently/apparently the ref is blind ... But he isn't blind.

(b) # Clearly/obviously the ref is blind ... But he isn't blind.

The mirative use only required that the $\neg p$ not be in the speaker's knowledge set to derive surprise, for the metaphorical use, however, it is not only necessary that $\neg p$ be in the common ground, but also that the observation e is as well. This condition on the availability of e is supported by the fact that the adverbs *clearly/obviously* are felicitous in this case (they were not in the mirative), which have this requirement on e.

By uttering the proposition marked with the APPARENT inferential in this context, the speaker indicates that all discourse participants have observation e which would be best explained by p (were it not the case that p is false). There is not a collective update of all discourse participants' knowledge sets for two reasons: (i) there is only indirect, non-certain evidence that p is true, which is not enough to override the assumption that $\neg p$ is true (unlike the mirative case, where there was certain evidence), and (ii) although the speaker indicates that there could be a collective revision of $(K_{CG} + e) * p$ given the observation, it is not the case that there should be.[20] In the case of sarcastic/metaphorical uses of evidentials,

[19] Just because the speaker assumes the ref is not blind, does not mean that he isn't. He could very well be blind and have been fooling the league this whole time.

[20] Note, however, if the observation were that discourse participants witnessed the ref take out a walking stick and his seeing-eye dog, there would most likely be a collective revision in terms of p, as in this case, the evidence relation is certain evidence R_D, and this case is a [plural] mirative case.

we see that evidence relations in combination with a more specific model of the context in terms of individual speakers' knowledge sets provide us with a powerful way to model non-literal uses of evidentials to illustrate how the semantics of the evidentials can still be accessed in evidential mirative and evidential sarcasm/metaphor cases.

Meaning	*Context Type*	*Evidence Relation Type*	*Evidential Expression*
Evidential	C_{EV} $(p, \neg p \notin K\ )$	R_I	evidently/apparently; clearly/obviously
Mirative	$C_{\neg EV}$ $(\neg p \in K)$	R_D	evidently/apparently; #clearly/obviously
Sarcastic/ Metaphorical	$C_{\neg EV}$ $(\neg p \in K, \neg p \in K_{i/CG})$	R_I	evidently/apparently; clearly/obviously

Table 4.3: Summary of Inferential Evidential and Literal/Non-literal Uses

We can summarize how each of the interpretations with the inferential evidentials arise in Table 4.3 above. I discuss the collective evidence context and addressee-oriented evidentiality, elucidating further why *clearly/obviously* does not take on a mirative interpretation, in section 4.4.

4.2.3 Evidence-Evidential Mismatch: Yup'ik Hearsay to Indirect– Evidence Promotion?

As discussed in section 1.1.3, the Yup'ik inferential APPARENT evidential, which usually marks propositions which have been inferred by something observable in the context, but can also mark hearsay evidence as well (Krawczyk 2009; 2010).

(317) Hearsay Evidence; Indirect or Reportative Evidential

Context: Bill and John have a friend Anna, and they stop by her house to see if she wants to snowmachine with them to Oscarville. Bill goes and knocks on Anna's door while John stays behind. Anna's husband answers the door and tells Bill that Anna has just left. With hearsay evidence from Anna's husband (his assertion),

Bill can felicitously say:

(a) APPARENT

Anna-aq *aya-llru-**llini**-uq*

Anna-ABS.3SG leave-PAST-INF-IND.3SG

'Evidently, Anna left.'

(b) REPORTATIVE

Anna-aq *aya-llru-uq=**gguq***

Anna-ABS.3SG leave-PAST-IND.3SG=HRD

'It is said Anna left.'

Bill may use the inferential *llini* (317a) or the REPORTATIVE evidential *gguq* (317b) to mark his observation of an assertion. In this case there are two things that need to be explained: (i) why Bill chooses to use the inferential and not the reportative evidential, and (ii) whether this is an example of evidence promotion, such as in the case of hearsay evidence expressed with DIRECT evidentials.

The answer to (ii) is more straightforward. Given our schemata of evidence relations and their correspondence to evidential types given in Figure 4.1, the answer to this question is no, this is not a case of evidence promotion. Both the hearsay evidence relation R_H (expressed by the REPORTATIVE/HEARSAY and QUOTATIVE evidentials), and the indirect evidence relation R_I (expressed by the APPARENT), are examples of abductive inferences to a best-fit explanation, of which the speaker remains uncertain. Hearsay and indirect evidence relations are evidence relations of the same best-fit strength, and thus in terms of the proposal here, this is not a case of promotion.

The answer to (i) requires further discussion on the additional assumptions about the implicatures that arise when one expresses a hearsay evidence relation in the discourse. The difference between R_H and R_I is that in the case of R_H, there is a further sub-specification on the type of observation the speaker has; where R_I is non-specific with respect to the form of e. Hearsay evidence, however, is subject to a high degree of variation in terms of its strength, ranging from direct evidence-like (such as true evidence promotion cases) to

essentially worthless in terms of its evidentiary value (felicitous subsequent denial cases).[21] The variation of reliability with respect to hearsay evidence can give rise to the implicature that hearsay evidence is a less trustworthy type of evidence source.

In the case of trustworthy hearsay evidence here, our argument is that speaker relays this evidence as R_I in order to suppress the additional implicature that the sub-specification of evidence of a previous assertion would carry, which could pragmatically weaken his evidential utterance. Perhaps in this case the speaker is aware that John does not like Anna's husband, and chooses to circumvent any objection that may arise by expressing that his inference rest's on Anna's husband's word. In this case, the speaker may obscure his specific observation subtype in order to relay an unspecified R_I relation and avoid any additional implicatures that may arise from R_H.

4.3 $R_I \leftrightarrows R_H$ Interpretations of *Apparently/Evidently* (and Evidential Perfects)

In English, a speaker may report a proposition learned by previous assertion with *apparently/evidently* rather than *reportedly/supposedly/allegedly.*

(318) Hearsay Evidence; Indirect or Reportative Evidential

Context: Your friend John tells you that he saw Bill, your roommate, out on a date last night. John is Bill's best friend, and you also know that Bill at least did not home last night until later.

You can felicitously tell Mary the next day:

(a) Apparent:

Evidently/Apparently Bill was out on a date last night.

(b) Reportative:

Reportedly/Supposedly Bill was out on a date last night.

[21] I discuss in section 4.5.

The choice to relay the unspecified inference to the best-fit explanation R_I, over the specified inference to the best-fit explanation R_H, seems to be quite common in cases where the assertion comes from a reliable source; a strategic way to avoid any implicatures that may arise from specifying one has an observation of a previous assertion.[22]

Yet unlike Yup'ik *llini*, propositions marked with *apparently/evidently* can be subsequently denied. This is also the case for the perfect of evidentiality in Bulgarian and Turkish (Izvorski 1997; Aksu-Koç & Slobin 1986). In these cases, the inferential APPARENT evidential takes on a reportative R_H interpretation only; the inferential interpretation R_I is blocked.

(319) DERIVED HEARSAY INTERPRETATION OF THE APPARENT

Context: Your friend John tells you that he saw Bill, out on a date last night. John is Bill's best friend, and Bill is your roommate. Bill did not come home last night until later.

You say:

Evidently/Apparently Bill was out on a date last night... But I don't believe it.

The hearsay interpretation of the APPARENT in English can arise not only from subsequent denial of the proposition marked with the evidential, but also in cases where only hearsay evidence is they only possible evidence, such as reporting tastes or weather in locations other than the speaker's.

(320) INFERENCE INTERPRETATION OF THE APPARENT UNAVAILABLE

(a) Evidently/Apparently this is the best pizza in D.C. (Hearsay; #Inference)

(b) Evidently/Apparently it's snowing in Dallas. (Hearsay; #Inference)

This phenomenon can be explained in the following way. The APPARENT expresses an inference to the best-fit explanation that remains uncertain, and both the evidence relations

[22]Note some evidentials are sensitive to close, familial relations. For example, in Tibetan, the EGO evidential is reserved for first-person statements. However, in some cases, a mother may use an EGO evidential to express something about her son, which she could not use in another case with a less-closely-related individual who is not herself (see Garrett 2001).

R_I and R_H fit this relation type. English *evidently/apparently* and evidential perfects express a best-fit explanation whose evidence relation interpretation is by default R_I, however, the R_H evidence relation interpretation is derivable from the context. In those cases where the normal R_I is unavailable, such as in the example above (320), those cases where the speaker overtly indicates that his inference is based on a previous assertion, or lastly, where the speaker indicates that his inference is unsound (such as in the case of subsequent denial of a proposition marked with *apparently/evidently*), then the R_H relation interpretation arises. In the last case in particular, the R_H interpretation arises because it is the only evidence relation that can be expressed with an evidential that can be felicitous denied. This felicitous denial implicates that the speaker has an evidence relation of R_H, by accessing the conversational implicature of hearsay evidence and its variable reliability.[23]

The argument that R_H and R_I both express the same type of inference to the best-fit explanation can explain the correlation and interchangeability of these two evidence interpretations and the APPARENT in English and perfects of evidentiality. Evidence source-type approaches do not offer any insight as to why or how these two "evidence source" meanings can be collapsed under the APPARENT type of evidential. The evidence relation approach, which argues that these express the same inference to best-fit explanation type, seems to offer an explanation that had previously been either glossed over or ignored.

4.4 Evidence Relations and *Clearly, Obviously*

In Chapters 1 and 2 (sections 1.2.2 and 2.1.2 in particular), we discussed the English adverbs *clearly, obviously* and *apparently/evidently* and the differences between their evidence signals. At first glance, these expressions seemed to both be examples of an APPARENT type of inferential evidential, as they both seem to express an indirect evidence relation R_I, and there are many cases where *clearly/obviously* and *evidently/apparently* are almost interchangeable in terms of their evidence signal.

[23] I discuss this particular aspect of the hearsay evidence relation and the expression of the hearsay relation more in depth in section 4.5.

These expressions, however, are not completely interchangeable. In (321) I provide an example evidential situation is given for the discourse adjective *clear* in Barker & Taranto (2003) and Barker (2009) (which I have modified for *clearly*). Barker (2009) argues that in the example in (321), the use of *clearly* in the case of Nawal is infelicitous because a grave expression is not taken to be a decidedly clear indication of one's being a doctor. The wardrobe of a lab coat and stethoscope, however, is indicative of Abby possibly being a doctor, and thus *clearly* is felicitous here. In both cases there is indicative evidence, as simply wearing a lab coat does not make it certain that Abby is a doctor; Abby could be an actress and only play a doctor on TV. In this sense the adverbs *clearly/obviously* seem to express that a speaker has an R_I type of explanation.

(321) Context: We have two photographs before us. One, labeled 'Nawal', shows a grave young woman in ordinary clothes. The other, labeled 'Abby', shows a different young woman wearing a white lab coat with a stethoscope around her neck.

  (a) # Clearly, Nawal is a doctor.

  (b) Clearly, Abby is a doctor.

What is surprising in this case, however, the adverbs *evidently/apparently*, which express a typical R_I relation, are not felicitous in either case, Nawal or Abby.

(322) Context: We have two photographs before us. One, labeled 'Nawal', shows a grave young woman in ordinary clothes. The other, labeled 'Abby', shows a different young woman wearing a white lab coat with a stethoscope around her neck.

  (a) # Evidently/apparently, Nawal is a doctor.

  (b) # Evidently/apparently, Abby is a doctor.

This is one of many examples which illustrate that *clearly/obviously* and *evidently/apparently* are not as interchangeable as has been assumed.

A Previous Proposal: Taranto 2006

Taranto (2006) argues that the difference between the adjective forms *clear, obvious* and *evident* and *apparent* is determined by the difference between the relative associations of probability and evidence of these expressions. Taranto posits the following "implicational hierarchies" in (323), scales determined by the minimum standard of probability (323a) or evidence (323b) that are required in order to felicitously mark a proposition with these adjectives. In the proposed hierarchies, '>' indicates 'dominates' and >> indicates 'strongly dominates'.

(323) Taranto's (2006) Implicational Hierarchies

(a) Implicational Hierarchy of Probability

obvious > *clear* >> *apparent, evident*

(b) Implicational Hierarchy of Evidence

evident, apparent >> *clear, obvious*

(Taranto 2006: 98)

Taranto argues that the Implicational Hierarchy of Probability reflects the fact that *obvious* imposes a higher minimum standard of probability than *clear* does. Both *obvious* and *clear* strongly dominate the standard imposed by *apparent* and *evident*. Taranto argues that if the minimum probability is such that it is satisfied for *obvious*, then it will be also satisfied for *clear, apparent* and *evident* (following the hierarchy).

On the Implicational Hierarchy of Evidence, the order of the adjectives are reversed. According to Taranto, *apparent* and *evident* require "strong direct evidence to support the conclusion that the propositional content is true," (2006: 98) which is "stronger" than that which is required by *clear* or *obvious*. In the case of *clear* and *obvious*, if the evidence is such that it is strong enough to be marked by *evident/apparent*, then it will also satisfy the evidence requirements of *clear* and *obvious*.

> . . . assertions of "apparentness" rely on evidence that is immediately perceptible to the discourse participants, while assertions of "obviousness" may involve less direct evidence; evidence that may need to be reflected upon before its relevance to the determination of the probability of the designated proposition can be established.
>
> (Taranto 2006: 101)

The scales of evidence and probability, then, are inversely proportional. Of course, Taranto does not provide a definition of how one determines the degree of evident-ness, what the standard of measurement is that is used to determine an expression's position on the Implicational Hierarchy of Evidence, if it is not determined by probability.

(324) Correlation between Probability and Directness of Evidence

> High minimum standards of probability correlate with less stringent requirements on directness of evidence, and looser minimum standards of probability correlate with higher standards for direct evidence.
>
> (Taranto 2006: 103)

Taranto provides the following examples, which she argues to be illustrative of the inversely proportional values of evidence and probability with respect to the adjectives *obvious* and *apparent/evident* in (325).

(325) Taranto's (2006) Obvious and Not Apparent

(a) It might be *obvious* that Van Buren has more experience than Cragen, but it certainly isn't *apparent*.

(b) It might be *obvious* that Van Buren has more experience than Cragen, but it certainly isn't *evident*.

(c) ?#It might be *obvious* that Van Buren has more experience than Cragen, but it certainly isn't *clear*.

(Taranto 2006: 101)

Taranto claims these examples confirm the validity of her evidential hierarchy. In (325a) and (325b), the obvious conclusion that Van Buren has more experience can be drawn from her résumé, but that she has more experience than Cragen fails to be evident or apparent because the way she executes her work.[24]

Putting aside the issue of how evident-ness is measured, if we look more closely at her examples, however, it does not seem that Taranto's hierarchies explain the differences between *evident/apparent* and *clear*. Taranto fails to take note of an additional fact about these expression, that the examples illustrate instead that the speaker of the propositions in (325) disagrees with his interlocutor's assessment of Van Buren's competence in comparison to Cragen's. A simple fact about evidence and evidence relation, which we have discussed at length at various points here, is that there must be a judge that make such determination. The above examples actually have implicit dative arguments who are the judges of evidence and obviousness. This is shown in (326a), where we also see that it seems that it must be a second person (non-inclusive if plural) argument in the first clause, and only the first person in second. I have collapsed *evident* and *apparent* here.

(326) Difference of Judgment

(a) Obvious to You, Not Me

i. It might be *obvious* **[to you]** that Van Buren has more experience than Cragen, but it certainly isn't *apparent/evident* **[to me]**.

ii. #It might be *obvious* **[to me]** that Van Buren has more experience than Cragen, but it certainly isn't *apparent/evident* **[to you]**.

[24]It is not clear why Taranto uses the modal *might* in the above examples. The addition of the modal and the subjective modifier *certainly* seems to add additional elements to the above examples which may muddy the differences which Taranto is trying to illustrate between *clear, obvious, evident* and *apparent*.

(b) Apparent to Me, Not Obvious You

i. It might be *apparent/evident* **[to me]** that Van Buren has more experience than Cragen, but it certainly isn't *obvious* **[to you]**.

ii. It might be *apparent/evident* **[to you]** that Van Buren has more experience than Cragen, but it certainly isn't *obvious* **[to me]**.

An additional requirement also seems to be that these implicit dative arguments must have distinct referents, such that a proposition cannot be both *obvious* and *not evident/not apparent* to the same judge at the same time. This is illustrated by the examples in (327).

(327) Obvious and Evident to Me

(a) # It might be *obvious* **[to me]** that Van Buren has more experience than Cragen, but it certainly isn't *apparent/evident* **[to me]**.

(b) #? It might be *evident/apparent* **[to me]** that Van Buren has more experience than Cragen, but it certainly isn't *obvious* **[to me]**.

If these expressions did express inverse evidence or probability values, we would expect the above examples to be felicitous, particularly in the case of the single judge. Yet it does not seem that this is the case, and the fact the above examples are not all felicitous indicates that in terms of the probability and evidence expressions of *clear, evident* and *apparent*, there is an overlap in meaning (that cannot be canceled) that must cause the infelicity.

We can further illustrate that the way in which Taranto models the distinction between *clear* and *evident/apparent* may not be the best-fit explanation of the difference between these expressions. As we saw in the discussion in the previous chapter (section 3.4), conditional probability increase is the way in which evidence is normally modeled. In fact, the example which seems to counter Taranto's inverse probability-evidence argument is the Bayesian inference example (Short-haired student). Here we saw that the conditional probability increase was enough to license the use of *clearly/obviously*, but not

evidently/apparently. This was only true, however, in the case where the truth-value of proposition was a matter of debate, and topical in the discourse.

(328) Bayesian Inference: Obvious but not Apparent

Context: You see a student at the school walking across the school quadrangle. You notice that the student has short hair (e). You know that at the school all the boys have short hair, although some girls do too. You have two hypotheses: that the student is a girl (b) or the student is a boy (b). According to Bayes, the probability that the student is female, given the short hair ($g|e$) is 13%, and the probability that it is a boy given that condition ($b|e$) is 86%.

You then say:

(a) *Out of the blue*:

i. # Clearly/obviously that is a boy.

ii. # Evidently/apparently that is a boy.

(b) *You and a friend are debating whether that person is male or female.*

i. Clearly/obviously that is a boy.

ii. # Evidently/apparently that is a boy.

What (328b) illustrates is not necessarily that the probability requirements are satisfied for the felicity requirements of *clearly/obviously* and not *apparently/evidently*, but that the more important difference between the two expressions, is that in the case of *clearly/obviously*, the topical nature of the proposition under debate (the explanatory proposition p), trumps the probability or evidence requirements of the expressions. It is not that these expressions have intrinsically different probability or evidential values.

Taranto's intuition, however, that *clear* and *obvious* concern probability, is not entirely incorrect. Perhaps what is shown by the felicity of *clearly/obviously* in the Bayes' example, is that in the case where discourse participants disagree or do not know the truth-value of p, the fact that there is a simple conditional probability increase seems to license the felicitous

use of *clearly/obviously*, but for *apparently/evidently*. The predictions given by Taranto's hierarchies of probability, however, are not borne out. The probability requirements that satisfy *clearly/obviously* should be such that they satisfy *apparently/evidently* but this is not the case. It does not seem to be the case that the differences between the two types of expressions can be represented hierarchically.

4.4.1 CG, Evidence Relations and *Clearly/Obviously*

We have additional examples of contexts where there is an R_I evidence relation, but *clearly/obviously* cannot be expressed without a further condition on the context of utterance. I have repeated the relevant examples which highlight these differences between *clearly/obviously* and *evidently/apparently* in (329).

(329) Divided Behavior in Apparent Contexts

(a) Observable Resultative

Context: You [and a friend] walk outside and you see that the streets are wet.

i. *Out of the blue*

A. # Clearly/obviously it rained.

B. Evidently/apparently it rained.

ii. *Debating whether it has rained or not*

A. Clearly/obviously it rained.

B. Evidently/apparently it rained.

(b) Reportative Evidence

i. # Clearly/obviously it is snowing in Chicago... That's what I heard.

ii. Apparently/evidently it is snowing in Chicago... That's what I heard.

(c) Subsequent Denial

i. # Clearly/obviously it is snowing in Chicago. . . But I don't believe it.

ii. Apparently/evidently it is snowing in Chicago. . . But I don't believe it.

(d) Observation/Conjecture

Context: Dark, black clouds loom overhead.

i. *Out of the blue*

A. # Clearly/obviously it is going to storm.

B. Evidently/apparently it is going to storm.

ii. *Debating whether it will storm or not*

A. # Clearly/obviously it is going to storm.

B. Evidently/apparently it is going to storm.

A few patterns emerge with *clearly/obviously* in the above examples. It seems that in cases where *evidently/apparently* is felicitous, but *clearly/obviously* is not, can be determined by whether the explanatory proposition p is topical in the current discourse context, and where all discourse participants are either publicly committed (Gunlogson 2001) to not knowing p, or disagree with respect their beliefs with respect to p. This property of *clearly/obviously* is evident by changes seen in examples (329a) and (329d); public commitment of not knowing p or disagreement with respect to p can make *clearly/obviously* felicitous in cases where *evidently/apparently* was not, such as in the Bayesian inference example in (328).

Another pattern that emerges, where *evidently/apparently* is felicitous but *clearly/obviously* is not, are those cases in which the speaker overtly indicates their evidence source is in the form of a previous assertion, example (329b). Attempts to deny the proposition marked with the adverbs as in (329c), are also not felicitous with *clearly/obviously*. It is not clear if this is an example of an evidence type issue, or rather the variable nature of the reliability of hearsay evidence. Common-grounded hearsay evidence examples necessitate that not only

do all discourse participants witness the assertion, but they also all agree on the reliability of the asserter. This may issue may be more to the point with the problem of hearsay evidence, than it is an issue of a common-grounded observation; the observation can be common grounded, but agents' judgments of the witnessed assertion may not coordinate.

We saw also that *clearly/obviously* cannot have a mirative interpretation, as shown in (330).

(330) Clearly Not Surprising

Context: From his window, Bill can only see smoke coming from a building (e = *see-smoke*; R_I). John can see that a building is on fire from his window (e = *see-fire*; R_D). John says:

(a) Apparently/evidently a building is on fire. (=Mirative)

(b) # Clearly/obviously a building is on fire. (≠Mirative)

Here the use of *clearly/obviously* is not infelicitous due to the fact that John has R_D type evidence. In this case, that which is clear to John is not clear to Bill; they do not have the same observation. In order for *clearly/obviously* to be felicitous, it is also must be the case that the observation e is available to all discourse participants. This requirement is further illustrated in the example in (331).

(331) Different Vantage Points

Context: Bill's cubicle allows him to see out of the window, but John's cubicle does not. *Only* Bill can see the black smoke coming from a building down the street.

Bill says to John:

(a) # Clearly/obviously a building is on fire.

(b) Evidently/apparently a building is on fire.

In the case of *clearly/obviously*, it seems that the discourse context must be a shared evidence context. We modify the evidence context proposed in (285) accordingly. In

order to reflect these additional restrictions, we include the following criteria, that neither the speaker or interlocutor know p (or disagree with respect to p), that it is public knowledge that neither knows p, that the truth value of p is a matter of debate, and that the observation e is available to all discourse participants.

(332) Shared Evidence Context (Preliminary)

A context C, which is composed of a speaker-agent a and interlocutor i, is a shared evidence context $C_{S_{EV}}$ if and only if,

(a) There is an observation e, such that $e \in K_a$ and $e \in K_i$, and

(b) There is an explanatory proposition p, such that

i. p is unknown to <u>both</u> s and i, <u>or</u> K_i and K_a differ wrt p,

ii. the truth value of p is a matter of debate in the discourse, and

iii. a believes that i does not know p

Restrictions with respect to the observation e and explanatory proposition p that are associated with *clearly/obviously* is not a matter of the evidence relation of the expression.

The Evidence Relation R_I and Clearly, Obviously

It is not clear whether the evidence relation associated with *clearly/obviously* is even of the R_I type. For example, unlike Yup'ik *llini* and other inferential evidentials of the apparent type, *clearly/obviously* does not take on a mirative interpretation in cases where the evidence relation is R_D (330). In fact, it does not seem that the semantics of *clearly/evidently* is even sensitive to a particular type of evidence signal, as it can be used felicitously and non-miratively with an R_D relation. Given that the one restriction of *clearly/obviously* is the public availability of the observation and the discourse participants' stances with respect to the truth value of p, the evidence relation R_{SI} is not felicitous (333).

(333) *Clearly/Obviously*: $\#R_{SI}$

<u>Context</u>: You are the one designated to keep the box of wine bottles in your office for

the department welcome party. You go to take the box to the party, but find some wine bottles are missing. You have no indication of a possible culprit, except that you know that one of your colleagues, John, is quite the wine-lover.

Clearly/Obviously John drank all the wine.

It seems that *clearly/obviously* is felicitous in cases of unspecified R_I and R_D, in this case. For example, if we alter the example in (331) to that where the context is such that both Bill and John can see the building on fire, then *clearly/obvious* is felicitous and the evidence relation is R_D, example (334).

(334) Different Vantage Points

Context: Bill's cubicle allows him to see out of the window, but John's cubicle does not. Both John and Bill can see the actual fire.

Bill says to John: Clearly/obviously a building is on fire.

the speaker's utterance of *clearly/obviously* in a shared evidence context must be such to allow for either evidence relation to have the same effect. In the shared evidence context, it is not the case that all discourse participants must not know the truth value, but only that it is publicly known that the *interlocutor* does not know p, and speaker-agent a believes at least *probably* p, but can extend as far as believing he knows p (although this may not often be the case). We can update our shared evidence context accordingly to reflect this.

(335) Shared Evidence Context (Updated)

A context C, which is composed of a speaker-agent a and interlocutor i, is a shared evidence context $C_{S_{EV}}$ if and only if,

(a) There is an observation e, such that $e \in K_a$ and $e \in K_i$, and

(b) There is an explanatory proposition p, and the truth value of p is a matter of debate in the discourse, and

(c) K_a and K_i differ with respect to p, such that

i. a believes that i does not know p $((p \notin K_i) \in K_a)$,

OR

ii. i publicly believes $\neg p$ to be true $((\neg p \in K_i) \in K_a)$

A proposal for the semantics of *clearly/obviously* is given in (336).

(336) CLEARLY/OBVIOUSLY

An utterance of *clearly/obviously* is felicitous if and only if

(a) The context is a shared evidence context ($C = C_{S_{EV}}$),

(b) The evidence relation given by e is R_I or R_D,

Such that interlocutor i must update K_i accordingly

It does not seem that the semantics of *clearly/obviously* is one that is specific to a particular evidence relation type. The felicitous use of *clearly/obviously* is sensitive to what is in the common ground. In this way *clearly/obviously* is the inverse of *evidently/apparently*, where *evidently/apparently* only truly concerned the speaker's knowledge set, *clearly/obviously* is an addressee-oriented evidential, the speaker expresses that the addressee must update his knowledge set based on what is observed. This captures what Bronnikov (2008) refers to as the "missing inference" expressed by *clearly/obviously*. The primary expression of *clearly/obviously* is that the speaker expects the addressee to take note of the available observation, in order to arrive at the best-fit explanation p, and to update their knowledge set accordingly. An interesting subject for future investigations would be to investigate whether we see these addressee-oriented evidentials cross-linguistically, or whether languages with morphological evidentials employ alternate strategies.

4.4.2 SUMMARY: INFERENTIAL EVIDENTIALS AS EVIDENCE RELATION EXPRESSIONS

The indirect evidence relation, when modeled as an inference to the best-fit explanation, captures the facts about the APPARENT. The best-fit explanation provides for an insightful

way to explain those cases that proved to be problematic for the evidence source type description given for the APPARENT evidential. The previous descriptions of 'inference from observable results', which had been given for the evidence signal of the APPARENT had proven to be uninformative when applied to novel evidence contexts.

For the semantics of the ASSUMED, we adapted the evidence relation to include an additional explanation, a personally chosen best-fit explanation, which we call a good-fit explanation. A personal best-fit explanation is expressed in cases where the objective probability distribution proves to be uninformative, such that the speaker must employ alternate means to determine which explanation is best fit. Due to the fact that the best-fit explanation chosen is personal, not all discourse participants may determine the best-fit explanation in this case similarly. This gives the impression that the ASSUMED expresses a weaker version of the evidence relation, which supports the numerous evidential and evidence hierarchies which ranks the ASSUMED evidential, or inference from general reasoning or assumed evidence, the lowest on hierarchies of evidence and evidentials. The ASSUMED, in that it expresses a personal best-fit explanation is unlike other evidentials, and may pattern more closely with epistemic modals than other evidentials. Untangling the semantics of the ASSUMED and epistemic modals is a subject that requires further investigation.

The fact that the APPARENT expresses an R_I evidence relation also may explain why some languages collapse hearsay and inferential evidence types under the APPARENT type of evidential. Certain contexts give rise to the hearsay interpretation with the APPARENT, but this is not the case with an ASSUMED. In the model presented here, the R_I and R_H express the same relation strength, that of a normal best-fit explanation. This is contrasted with the ASSUMED, which expresses a personal best-fit. Modeling the indirect and hearsay evidence relations as such may explain why we see that these evidence types alternate as the evidence expression of APPARENT evidentials and perfects of evidentiality, and why the R_H interpretation does not arise in cases of the ASSUMED. This phenomenon, in previous analyses, had been taken to be coincidental, a matter not necessitating explanation.

Also discussed in this section was the difference between the adverbs *clearly/obviously* and *evidently/apparently* in terms of the evidence signal of each. As we saw, these adverbs do not differ in their evidence relation. The difference between *clearly/obviously* and *evidently/apparently* concerns the orientation of the adverbs, where *clearly/obviously* is interlocutor-oriented, and *evidently/apparently* is speaker-oriented, and independent of an interlocutor. The felicity of *clearly/obviously* is sensitive to the context rather than to the actual evidence relation types. Thus the difference between *clearly/obviously* and *evidently/apparently* does not appear to be an evidential one, whereas the difference between *presumably* and *evidently/apparently* is.

4.5 The Hearsay Evidence Relation R_H and Reportative Evidentials

All reportative evidentials, illocutionary or modal, REPORTATIVE/HEARSAY or QUOTATIVE evidentials, express a hearsay evidence relation R_H, that the best-fit explanation p for an observation e, an assertion of p, is that p is true, but the speaker is not certain that p. I have repeated the proposal for the hearsay evidence relation below in (337).

(337) Hearsay Evidence Relation

In an evidence context C_{EV}, an evidence relation is **Hearsay** and of the form $R_H(a, e, p)$, if and only if

(a) e is the observation of a prior assertion of p, by an original speaker O in a cooperative context C, such that

i. $O \notin \{a, i\}$, and

ii. O's assertion of p is believed by a to be sincere and well-grounded;[25]

[25] O believes p to be true, or at least O has the appearance of believing p to be true.

(b) a remains uncertain that p, as

(c) p is the best-fit explanation but not the only fitting explanation of $K_a + e$, given that K_a does not include false assumptions with respect to C that would make e false.

The hearsay evidence relation R_H is the only relation presented here that is modeled as expressing a specific source type, a previous assertion. The problem that arises with the specification of an inference that rests on a previous assertion, is that assertions do not entail that the proposition expressed is true.

4.5.1 The Infelicity of Conflicting Reports and the Illocutionary Reportative

I argue here that the use of a reportative evidential carries the implicature that the original assertion is a reliable one; that the speaker believes that what he expresses is a valid inference given what he observes. In the case of epistemic reportatives, such as in St'át'imcets, this implicature cannot be canceled; in the case of illocutionary reportatives, it can be canceled, but it must be done so overtly. The difference between the REPORTATIVE/HEARSAY evidential and the QUOTATIVE evidential is that the QUOTATIVE evidential overtly specifies the identity of the original speaker, and thus the identity of the original speaker becomes common ground knowledge. In the case of QUOTATIVE then, the reliability of the original speaker may be known to all discourse participants, and such overt denial may not be necessary in order to cancel the implicature.

The fact that the speech act of the original speaker is an assertion, it carries an implicature of its own, that he the original speaker has direct evidence for the proposition he has asserted. A speaker who expresses a proposition marked with a reportative evidential offers someone else's [assertion of] direct evidence as his evidence for a proposition p, a sort of direct evidence by proxy.

When we assume the opposite of previous analyses, that reportative evidentials do commit the speaker to the proposition expressed; this is what prohibits a speaker from marking two contradictory propositions with a single REPORTATIVE evidential.[26] Although a speaker may utter the propositional marked with a REPORTATIVE/HEARSAY evidential and then subsequently deny the propositional content, he cannot use a single illocutionary REPORTATIVE/HEARSAY evidential in Yup'ik, English, Cheyenne, and Cuzco Quechua to mark two conflicting reports. I repeat the Yup'ik example below (338).

(338) CONFLICTING REPORTS WITH *gguq*

# *John-aq-**gguq***	*K300*	*qakvar-tuq,*	*Bill-aq-llu*	*K300*	*qakvar-tuq*
John-ABS.3SG=HRD	K300	win-IND.3SG	Bill-ABS.3SG=and	K300	win-IND.3SG

(Intended: 'It's said that John won the K300 and Bill won the K300')

There are some aspects of the lack of speaker-marking that may contribute to the infelicity above (see section 2.2.2). The English QUOTATIVE evidential *according (to X)*, because it can overtly mark two different original speakers, is still infelicitous with only one instance of *according (to X)*, but in the case that there are as many evidentials as reported propositions, then one can relay conflicting reports felicitously with multiple instances of *according (to X)*, where each X is a unique speaker.

(339) THE QUOTATIVE AND CONFLICTING REPORTS

(a) # According to John and Bill, Joe won and Ben won.

(b) According to John, Joe won, and according to Bill, Ben won.

The evidence relation as abductive inference can explain the infelicity of the above examples quite nicely. In each these case we have an observation of an assertion of p and $\neg p$ (which may or may not be from the same speaker, although in the case of the REPORTATIVE/HEARSAY, the original speaker is taken to be singular). If one were to mark a proposition of the form p *and* $\neg p$, he would express that the best-fit explanation for why someone

[26]Speakers are committed to some degree. How we model this variation of commitment is not addressed here.

would assert *p and* $\neg p$ is that *p and* $\neg p$ is true. We see the problem with this instantly; that both p and $\neg p$ are true is impossible. It is not a valid inference to conclude that *p and* $\neg p$ is the best-fit explanation for the observation of assertions of p and $\neg p$. That contradictory propositions are simultaneously true is not an available live option.

In terms of the QUOTATIVE *according (to X)*, the reports are indexed to a known original speaker. In the case of two instances of *according (to X)* in (339b), it may be the case that this is felicitous because the best-fit explanation for why Bill would assert *Ben won* is because Bill believes that Ben won, and the best-fit explanation for why John asserted *Joe won* is because John believes that Joe won. In the case of one instance of *according (to X)* in (339a), we cannot access the two different speakers, and the example is interpreted as two people asserting one contradictory proposition.[27]

If we posit that the commitment of the reporting speaker is a conversational implicature in the case of illocutionary reportatives, then we can explain the deniability facts just as easily as the infelicitous contradictory facts of the illocutionary reportatives that could not be explained when it was assumed that neutrality was inherent to the semantics of the illocutionary reportative evidentials. The key element to the deniability of the illocutionary reportative evidentials is that the speaker must do something overt in order to cancel the implicature of endorsement. Without overt cancellation, the speaker will be assumed to endorse the proposition marked with the REPORTATIVE, as the general assumption of discourse participants is that speakers only utter those propositions they believe to be at least possibly true.

[27]Two instances of the REPORTATIVE do not appear to be as clearly felicitous as the QUOTATIVE.

(i) THE REPORTATIVE AND CONFLICTING REPORTS

(a) # Reportedly, Joe won and Ben won.

(b) ? Reportedly, Joe won, and reportedly, Ben won.

4.5.2 The Judge of Hearsay Evidence

A judge must determine if a previous assertion is indeed evidence for a proposition, in order to express this proposition with a reportative evidential felicitously. In the case of the epistemic reportative, that the speaker believes the propositional content is non-cancelable.[28] In this example, one discourse participant challenges the other's claim that *Buffy St. Marie is coming to Mount Currie*, is valid as it is based on the fact that someone named Bill is the source of the report.

(340) A Judge of Hearsay Evidence: Buffy St. Marie Example

Context: Bill is a liar; he always lies and never tells the truth. You never believe what he says. Yesterday you heard Bill telling me that Buffy St. Marie is coming to Mt. Currie to give a concert.

That was the first time you had heard of this; and you don't know whether it's true or not, but you usually don't believe what Bill says so you think he's probably lying. Then today you hear me telling someone else:

(a) *cuz'* ***ku7*** *ts7as* *k* *Buffy St. Marie* *e-ts7á* *LŠl'wat'a*
going.to REPORT come DET Buffy St. Marie to-deic. Mt. Currie-EXIS
"[reportedly] Buffy St. Marie is coming to Mt. Currie."

You say to me:

(b) *aoz* *kw* *s-wenácw*; *kakez7-úlh* *k* *Bill*
NEG DET NOM-true; lie-always DET Bill
"That's not true; Bill is a liar."

(Matthewson, et al., 2007: 226)

Here we can account for the infelicity in (340) by the simple explanation that two people evaluate the contribution of Bill's assertion differently. We can model our divergent views

[28] It can be either a presupposition or conventional implicature (rather than conversational). Matthewson et al. (2007) use the following example in (340) to illustrate that the evidential content is a presupposition that can be challenged by von Fintel's (2006) *Hey wait a minute test!*.

about Bill's reliability as the difference in the status of the proposition *Bill is a liar* has in each of our minds, which we can represent this as indexical knowledge sets, K_{me} and K_{you}.

(341) Two Views of Hearsay Evidence

Context: You think Bill is a liar, but I don't. Every time he has told me something, it generally turns out to be true. Every time he has told you something, it has not been true.

Bill is a liar $\in K_{you} \nRightarrow Ku?$

Bill is a liar $\notin K_{me} \Rightarrow Ku?$

You do not accept that the best-fit explanation for why Bill would assert p is that p is true, since, to you, Bill is insincere and asserts falsities. Bill does not have this reputation with me, however, and I find Bill reliable. Since I assume Bill's assertion to be sincere and well-grounded, I believe that the best-fit explanation for why Bill asserted p is that p is true. Thus how we arrive at separate conclusions with respect to Bill's assertion *Buffy St. Marie is coming to Mt. Currie* is reflected in the difference between our two knowledge sets with respect to our opinion of *Bill* as a source.

4.5.3 Deriving the Variable Nature of Hearsay Evidence

The fact of the matter is that speakers can assert falsities as easily as they can assert truths, and this is what makes hearsay such a variable evidence source. The variability of hearsay evidence is what gives hearsay evidence and the [illocutionary] REPORTATIVE/HEARSAY evidential its apparent weakness (see discussion in sections 2.2.2 and 2.3.3). Most assume that the value of strength of hearsay evidence is reflects only whether the original speaker is reliable, however this is not the case.

The value of hearsay evidence is conditioned on two factors. The first is the reliability of the original speaker, their TRUSTWORTHINESS as a source. A speaker's trustworthiness value is determined by how often his assertions are found to be sincere. This value is represented as [± trust]. The second condition is the value given by the basic evidential contribution

that an assertion of a proposition gives to that proposition. For example, assertions about propositions for which there is no other evidence (e.g., someone going to Cuzco tomorrow), are more valuable as evidence sources than assertions about events that can be witnessed (e.g., a car accident). This value is the CONTEXTUAL VALUE of reportative evidence, [± cv]. The value of [± trust] is judged by the speaker-agent; whereas [± cv] is a less dependent on the beliefs of the speaker, based on real-world experience that correlates felicitous assertions with types of propositions. The combined value of the trustworthiness of the source and the contextual value of the assertion determines one's value of his hearsay evidence, H_O (where O is the original speaker).

(342) THE VALUE OF HEARSAY EVIDENCE

$\boldsymbol{H}_O$ = value of the prior assertion of p, given by an agent O in a context C, given in terms of [± cv, ± trust]

Trustworthiness

Reports can come from a variety of types of people: experts, flakes, dilettantes, lying thieves. That a report must be human is not even a requirement, as prophetic animals like Paul the Octopus or Punxsutawney Phil are also capable of predictive assertions.[29] To be a reliable asserter, one must simply have a good track record of asserting truths or making accurate predictions.

Of all these types, we only need three to illustrate how the hearsay relation and value of hearsay evidence explain all cases of the REPORTATIVE/HEARSAY evidential. The basic types of "asserters" are: (i) the sincere NORMAL GUY (N), (ii) the intentionally insincere LYING

[29]Paul the Octopus (2008-2010) the common octopus at the Sea Life Centre in Oberhausen, Germany whose feeding behavior predicted the winner of every match that the German national soccer team played and the final of the 2010 FIFA World Cup (See: http:// en.wikipedia.org/Paul_the_Octopus).

Punxsutawney Phil is an American groundhog that lives in Punxsutawney, Pennsylvania. The presence of his shadow on February 2^{nd} of each year is used to predict the remaining duration of winter. (See: http://en.wikipedia.org/wiki/Punxsutawney_Phil) In the case that one wants to know how much longer winter will be, one can felicitously as *According to Phil, there will be six more weeks of winter* or even *Apparently there will be six more weeks of winter.*

THIEF (T), and (iii) the unintentionally insincere FLAKE (F). I have included a summary of these types and their trustworthiness value in Table 4.4.

Type	Abbr.	*General Characteristics*	*Trustworthiness*
FLAKE	F	Someone who says they will do something, but often doesn't (unintentionally infelicitous)	[– trust]
NORMAL GUY	N	Someone who is taken to be reasonably accurate	[+ trust]
LYING THIEF	T	Someone who makes false statements knowingly (intentionally infelicitous)	[– trust]

Table 4.4: Generic Types of "Asserters"

The value of [± trust] indicates how "good" someone's word is generally taken to be; the [± trust] value of hearsay evidence is a value that should be considered somewhat independent of the context, and reflect the basic character of the speaker, the difference between a normal, reliable person and a flake, which is informed by a person's assertion habits

Contextual Value

The contextual value of hearsay evidence [± cv] is not a value that is determined by the general habits of a particular person, but rather the value that the act of a sincere assertion can give to determining whether a proposition is true or not. For example, imagine case where your friend Bob, a normal guy (H_N=[+trust]), has told you two propositions, *p, He got a got new shoes yesterday* and *q, Eating too much Broccoli causes cancer.* Your friend Bob is not a doctor, cancer researcher or lawyer in a class-action suit against broccoli, but simply just another guy at the office. In this case, you would most likely not take Bob's assertion as evidence that Broccoli causes cancer, however, you would take Bob's assertion that he got new shoes as evidence that he did get new shoes. In both cases, Bob's general trustworthiness value should remain the same, however, Bob's ability to be regarded as an authority on the subject matter of the proposition is what is evaluated with the [± cv] value.

(343) Determining Contextual Values: Source-dependent

(a) O = Bob, [+ trust]

p = A proposition about Bob getting new shoes, [+ cv]

e = Assert(O, p)

$\Rightarrow \boldsymbol{H}_O(p)$ = [+ cv, + trust]

(b) O = Bob, [+ trust]

q = A proposition about the carcinogenic broccoli, [– cv]

e = Assert(O, q)

$\Rightarrow \boldsymbol{H}_O(q)$ = [– cv, + trust]

It is important that we make this distinction when determining the value of hearsay evidence for a given proposition, as this is how to explain the variable quality associated with hearsay evidence. In Figure 4.2, I have summarized the four possible value pairs in how they are determined by H_O (where *best/only* is short for the best or only evidence source possible for a proposition).

Trustworthiness of Source	*Contextual Value of Hearsay Evidence*	
	[**–cv, +trust**] Hearsay ≠ best/only; Reliable Speaker	[**+cv, +trust**] Hearsay ≠ best/only; Unreliable Speaker
	[**–cv, –trust**] Hearsay = best/only; Reliable Speaker	[**+cv, –trust**] Hearsay = best/only; Unreliable Speaker

Figure 4.2: Hearsay Evidence in Two Dimensions

4.5.4 Expressing Reliability of Hearsay Evidence

Whether the speaker has hearsay evidence that can be promoted, or hearsay evidence that can be denied, is determined by the values of [± cv, ± trust].

A Normal Reportative: [– cv, + trust]

The normal case of the reportative, is context in which the original speaker is reliable, but hearsay not the best evidence source for a proposition; you have not directly witnessed and event yourself, and you only have the evidence of the assertion. In our example below, a normal guy (original speaker *N*, who has a value of [+ trust]), reports the proposition *p, Bill hit John*, and is valued [– cv], because the best evidence for this particular proposition is if you had visually witnessed the altercation yourself.[30] In this case, H_N = [– cv, + trust].

(344) The Normal Case of Hearsay Evidence

O = Normal Guy N, [+trust]

p = A proposition about Bill hitting John, [– cv]

$e = Assert(O, p)$

$\Rightarrow \boldsymbol{H}_O(p)$ = [– cv, + trust]

In this case the speaker expresses the proposition *Bill hit John* marked with a reportative evidential, assuming that the context is an evidential context (neither our speaker or addressee know p). By marking p with the reportative, the speaker expresses that the best-fit explanation to why N asserted p is that p is true, but he is not certain that it is.

A Liar's Report: [– cv, – trust]

Let us assume that we have the same proposition, a report of *p, Bill hit John*, but we change the original speaker source to now be our lying thief, who may have been well-intentioned in his assertion, but due to his known penchant of asserting falsities, he associates with value of [– trust]. In this particular case here, the context is such that hearsay is neither the best or only evidence source, [– cv], and thus H_N = [– cv, – trust].

[30]Note that in the case that you also see the result of the hitting event, such that John has a bruised eye and a bloody nose, and a report of the hitting, the speaker can also mark this case with a reportative evidential. See discussion of Pedro's Hen, section 4.6).

(345) The Case of the Lying Thief

O = Lying Thief T, [– trust]

p = A proposition about Bill hitting John, [– cv]

$e = Assert(O, p)$

$\Rightarrow \boldsymbol{H}_O(p)$ = [– cv, – trust]

In the case that the speaker relays the lying thief's assertion with the REPORTATIVE evidential in an evidence context, he expresses that the best-fit explanation for why a lying thief would assert p is that p is true. This is not the case; this act is not infelicitous on the part of the speaker, although it is not the case that p is true is the best-fit explanation for why a lying thief would assert p.

This is one case where the REPORTATIVE is used in a metaphorical way, the use of the REPORTATIVE that previous proposals take to be the typical example of illocutionary reportative evidentials. In this case, in order for the reporting speaker to convey the value of H_O = [– cv, – trust], he must overtly cancel that he has an inference to the best-fit explanation based on a report of a lying these. This can be accomplished by either denying that he believes the proposition or altering his voicing or intonation (Grivičić & Nilep 2004).[31]

Evidence Promotion: [+ cv, + trust]

In the case of evidence promotion (section 3.2.1), both values are positive. The speaker is a normal guy N, whose value is [+ trust] and an assertion here in this case is the only possible source, and is thus valued at [+ cv]. Here our case is our evidence promotion case, where our asserter, Inés says she will be going to Cuzco Quechua tomorrow.

[31]In a sociolinguistic study of the use of *yeah* on the receiver end of telemarketing calls, Grivičić & Nilep found that when *yeah* was uttered with creaky voice, it was used to for "passive recipiency", or to indicate the desire to either not continue with the current topic of discussion, or the lack of agreement with the interviewing speaker.

(346) The Case of Evidence Promotion, $R_H \approx R_D$

O = Inés (N), [+ trust]

p = A proposition about Inés is going to Cuzco tomorrow, [+ cv]

e = Assert(O, p)

$\Rightarrow \quad \boldsymbol{H}_O(p)$ = [+ cv, + trust]

$\downarrow$

$R_H \approx R_D$

These are the evidence promotion cases, where the speaker relays the hearsay evidence relation with the direct evidential, and not the reportative evidential in an evidence context. I have repeated the example from Cuzco Quechua (Faller 2002) in (347).

(347) Evidence Promotion: Hearsay to Direct

(a) Inés is reliable

Paqarin	*Inés-qa*	*Qusqu-ta-**n***	*ri-nqa*
Tomorrow	Inés-top	Cuzco-acc-dir	go-3fut

'Inés will go to Cuzco tomorrow [direct].'

(b) Inés is not reliable

Paqarin	*Inés-qa*	*Qusqu-ta-**s***	*ri-nqa*
Tomorrow	Inés-top	Cuzco-acc-rep	go-3fut

'Inés will go to Cuzco tomorrow [hearsay].'

(Faller 2002: 96)

In languages where the reportative evidential carries such epistemic extensions where proposition content can be denied, then the reportative evidential is not chosen to mark an assertion is which rated [+ trust, + cv]. In languages such as Shipibo-Konibo, where the reportative evidential lacks such implications of unreliability, or St'át'imcets reportative modal *ku7*, then one expects that even in the case of [+ trust, + cv], the reporting speaker

may use the REPORTATIVE evidential.[32] When a speaker chooses to relay his hearsay evidence with a DIRECT instead of a REPORTATIVE evidential, he expresses that the only-fit explanation for why O would assert p is that p is true, and of this he is certain. The value given by H_O, in the case of [+ cv, +trust] allows R_H to afford the same degree of certainty as R_D, and is relayed as such.

The use of the sourceless illocutionary REPORTATIVE evidential in the case of [+ cv] assertions can be indicative of two cases: (i) that the report about Inés' travel plans did not come from Inés herself, or (ii) Inés often claims she will do things, but often does not follow through. In the case of (i), the report was not a self report, and thus not [– cv]; for cases of [– cv, + trust], see (344). In the case of (ii), Inés is a flake, and the value of speaker reliability is altered to [– trust]; I discuss (ii) next.

A Flake's Report: [+ cv, – trust]

As mentioned previously, there are some cases in which one has hearsay evidence that is [+cv] and evidence promotion does not occur, in this case we focus on when the report is rated [+ cv], the best or only evidence source for a proposition p, but the original reporter is unreliable; the speaker is considered to be of the Flake type with a trustworthiness value of [– trust]. The proposition remains the same, that Inés will go to Cuzco Quechua tomorrow.

(348) The Case of the Flake R_H

O = Inés (F), [– trust]
p = A proposition about Inés is going to Cuzco tomorrow, [+ cv]
e = Assert(O, p)
$\Rightarrow \boldsymbol{H}_O(p)$ = [+ cv, – trust]

[32] This is not tested here; it remains an open question as to whether [+ trust, + cv] reports are cross-linguistically preferred to be relayed with the REPORTATIVE evidential or DIRECT evidentials.

The [– trust] value alters the pragmatics of the reportative evidential when it marks this type of hearsay evidence. If the speaker relays the above case with a REPORTATIVE evidential in an evidential context, then the speaker expresses that the best-fit explanation for why an untrustworthy person would assert p is that p is true, but it is not the case that this inference is valid.

We can illustrate the infelicity of such a case with the QUOTATIVE, where we can be explicit as to the identity of the original speaker. When the QUOTATIVE marks this type of proposition, the result seems to be completely infelicitous when marking a [+ cv] report.

(349) #? According to Inés, Inés is going to Cuzco tomorrow.

It is not felicitous to mark a [+ cv, – trust] report of p as the best-fit explanation for why an untrustworthy person would assert p; this intuition is supported by the infelicity of the QUOTATIVE in (349). It seems that in all cases where H_O has the value of [– trust], it is one must overly indicate that the evidential is used in a non-literal way, and must overtly indicate that the speaker is not using the reportative in a literal way.

Deniable Reportative as Metaphorical Evidential Use

We see that there is a link between the non-literal use of the APPARENT and illocutionary reportative evidentials in the cases of H_O = [± cv, – trust]. In cases of deniable reportatives, the reportative is used in metaphorical, counter-factual way, such that if it were the case that Inés were reliable, then the speaker would have hearsay evidence that she is going to Cuzco tomorrow. The speaker must overtly cancel the implicature of good hearsay evidence in order to indicate that in this case his asserting speaker cannot even be trusted with propositions asserted about herself. The speaker uses the evidential to mark a best-fit explanation for a proposition that he does not believe to be true, and this is similar to the metaphorical use of the inferential evidential discussed in section 4.2.2. The only difference, however, is that in the case of the reportative, the observation (the assertion) may not have been available

to all discourse participants, and thus the speaker must provide an additional overt signal that his use of the reportative is done so in a non-literal way.

4.5.5 Summary: H_O and Evidential Choice

Table 4.5 summarizes how the value of H_O in terms of [± cv, ± trust], can predict how a speaker chooses his evidential. In the following table, evidence relation in parentheses "()" indicates a metaphorical/counterfactual use of the REPORTATIVE, such that he does not actually have a true R_H relation (his inference to the best-fit explanation is based is determined in a faulty context).[33]

H_O	*Evidence Relation*	*Evidential*
[– cv, + trust]	R_H	REPORTATIVE/QUOTATIVE
[+ cv, + trust]	$R_H \rightarrow R_D$	DIRECT*
[+ cv, – trust]	(R_H)	REPORTATIVE/QUOTATIVE + Denial
[– cv, – trust]	(R_H)	REPORTATIVE/QUOTATIVE + Denial

Table 4.5: H_O and Evidential Choice

It seems that only those cases where H_O has a [– trust] value, the speaker of the illocutionary reportative must signal that his inference was not made under felicitous circumstances; the value of [± cv] is only relevant in the case of determining when to promote one's hearsay evidence relation to direct.

4.6 Pedro's Hen: $R_H > R_I$

One last issue to discuss with respect to the hearsay evidence relation R_H is the Pedro Hen example from Cuzco Quechua (Faller 2002). Although hearsay is regarded as a weak evidence source, it can sometimes appear to be taken to be more accurate than inference.

[33]It is possible that in the case of Shipibio-Konibo or reportative modal such as St'át'imcets, where the reportative evidential does not have an "epistemic extension", the REPORTATIVE/QUOTATIVE evidential or modal may be used.

In this case, a farmer Pedro relays his conjecture that *p, A fox took my hen* with the CONJECTURAL evidential *-chá*, but then follows his report with an eye-witness report of *q, A puma took my hen* marked with the REPORTATIVE/HEARSAY evidential *-si*. This may call into question the validity of his initial inference; according to Faller, Pedro indicates that he prefers the eyewitness report to his conjecture. The example is repeated in (350).

(350) PEDRO'S HEN: REPORT >CONJECTURE

(a) *Atuq-**chá*** *wallpa-y-ta* *apa-rqa-n*
fox=CNJ ben-1-ACC take-PAST1-3
'I concluded a fox took my hen.'

(b) *Ichaqa* *wasi* *masi-y* *riku-sqa*, *puma-**s*** *apa-n-man* *ka-rqa*
but house friend-1 see-SQA, puma-REP take-PAST-3-IRR be-PST-3
'But my neighbor (lit. 'house-friend') saw it [happen], and [he says] a puma took it.'

(Faller 2002: 69)

In Faller's scenario given, Pedro has at first two observations: (i) the trail of bloody feathers, and (ii) a missing hen. Given what he knows, in addition to observations (i-ii), he marks the proposition *A fox took my hen* as a good-fit explanation given what he knows and observes with the CONJECTURAL.

(351) PEDRO'S FIRST GUESS

At time t_{e_1}:

e = An observation of: A trail of bloody feathers; A missing hen;

K_P = {Hens can be eaten by carnivorous animals; Foxes are carnivores; Pumas are carnivores; Pumas are far less frequently seen, ...}

$\rightarrow_{R_{SI}}$ *A fox took my hen*

The CONJECTURAL marks Pedro's explanation for what he considers to be a personal best-fit (good-fit) explanation given what he knows and observes. There is nothing in the context that determines the fox to be the best-fit explanation for what he observers.

Pedro, however, makes an additional observation, (iii) that of his neighbor's eyewitness report that a puma took his hen, q. Now, given what he knows and what he observes (i-iii), p is not the best-fit explanation, rather the best-fit explanation for (i-iii) is q.

(352) PEDRO'S NEW OBSERVATION AND SECOND GUESS

At time t_{e_2}:

e = An observation of: (i) A trail of bloody feathers; (ii) A missing hen; (iii) A report of a puma taking the hen;

K_P = {Hens can be eaten by carnivorous animals; Foxes are carnivores; Pumas are carnivores; Pumas are far less frequently seen, ...}

$\rightarrow_{R_H}$ *A puma took my hen*

That which tips the balance is observation of his neighbors assertion, and the best-fit explanation for why his neighbor would assert *A puma took the hen* is that a puma did take the hen. The evidence relation, modeled in terms of observations and best-fit explanations, explains the above case quite nicely, as both p and q can explain the first case, but only q best explains the second case, all three observations. We would assume that if his neighbor is an unreliable source, blind or often hallucinates, then Pedro would not bother relaying the report of the neighbor (in which case she is [– trust]), and remain with his initial inference expressed by *p-chá*. The use of the REPORTATIVE, however, may not necessarily cancel Pedro's initial determination, because in both cases he expresses that he is not fully certain that either p or q are true.

4.6.1 SUMMARY: THE HEARSAY EVIDENCE RELATION AND REPORTATIVE EVIDENTIALS

As we see from the discussion above, modeling illocutionary reportative evidentials as marking the proposition that is the best-fit explanation for why someone would assert that

proposition illustrates much that seemed to be behind the scenes of reportative evidentials and the hearsay evidence source. This model provides a way to predict those cases where illocutionary reportatives are used in a non-literal, metaphorical way, when they mark propositions that can be uttered and canceled, as well the opposite cases, where hearsay evidence was marked with a DIRECT evidential (evidence promotion).

In the case of reportative evidentials, the implicature is that the speaker believes that the best-fit explanation for why someone would assert a proposition, is that the proposition is true, that the original assertion is sincere. The best-fit explanation model for hearsay evidence as marked by reportative evidentials provides an explanation for why marking two contradictory propositions with a single reportative is infelicitous, an example that proved problematic for previous formal descriptions which assumed illocutionary reportatives to be neutral evidentials (Faller 2002; McCready & Ogata 2007; Murray 2010).[34] This proposal diverges from previous formal semantics of illocutionary reportatives (Faller 2002; McCready & Ogata 2007; Murray 2010) in that the non-committed meaning of the reportative is the contextually-derived meaning, parallel to the non-literal uses of the APPARENT inferential, although unlike the APPARENT, however, in order to mark a proposition which one does not believe is true with a reportative evidential, a speaker must overtly indicate this lack of belief. We see that by modeling the cancelable meaning of the reportative as a derived meaning, we can account for far more cases of the reportative than we could when we assumed that the deniability facts were inherent, semantic properties of illocutionary reportatives. There is no such thing as a neutral evidential in the proposal here.

[34]English is unique in that it can have multiple instances of *according (to X)* and *reportedly* in a single utterance. This is not possible for Yup'ik, *=gguq* can only appear once.

Chapter 5

Conclusions, Remaining Issues and Future Directions

The primary focus of the proposal here concerns what may be considered a very basic, but intrinsic part of semantic analyses of evidentials that seemed to be overlooked in previous formal semantic analysis. Perhaps it is rather audacious to assume that the question *What is evidence?* could be answered, and the difficulty in answering such a question should have been reason enough to simply make those same assumptions about how a speaker, his evidence, knowledge, and a new proposition relate. This would not have contributed much to the field; any analysis presented even on half-worked-out assumptions would have missed the many connections we seemed to uncover here (such as the links between the APPARENT and the REPORTATIVE. The proposal presented offers much more for future work on evidential and other expressions that carry an evidential component to their semantics.

The analysis offered here does a significant amount of preprocessing on the evidential data. We now have a way of analyzing evidentials as a natural class, where there are no outliers (such as the case with reportative evidentials in some analyses). Evidentials are argued to all mark a speaker's best-fit (or good-fit) explanation for what he observes, his abductive inference. Evidentials are expressions of an evidence relation type R, the relation that a speaker-agent a judges to exist between what he observes e, and the best-fit explanation p, given what he knows about the world.

The evidence relation R can be parameterized to reflect a particular evidential's semantics. R can vary in a few ways: (i) how certain a speaker is that his explanation is true, (ii) how he chose the explanation, or (iii) what was the form of the observation. In this case, only (iii) bears some resemblance to the previous source-type proposals. Admittedly, the

goal was not to avoid source types altogether, but to devise a more insightful way to unify the variety of proposed source types in what they actually express.

The first decisive cut made between evidence relation type is in terms of certain/uncertain. Only speakers with direct evidence relations can reason their best-fit explanation to a certainty. We called this case the "only best-fit" explanation, and place DIRECT, NV-SENSORY and unmarked assertions (that express abductive inferences of this type) here. A summary is provided in Table 5.1.

Certain (R_D)	DIRECT NV-SENSORY Simple Assertions
Uncertain (R_I, R_{SI}, R_H)	APPARENT REPORTATIVE/HEARSAY ASSUMED QUOTATIVE

Table 5.1: Evidentials in Terms of Certain/Uncertain

All other evidentials, mark those explanatory propositions to which a speaker remains to some degree uncertain that it is true. Indirect (uncertain) evidentials are further subdivided, based upon the types of evidentials observed in natural language. One parameter is defined in terms of how the speaker-agent reasoned the proposition to be the best-fit explanation, whether his determination was based on non-personal prior probabilities, such that all interlocutors would determine the same, or whether it was calculated by way of personal prior probabilities, such that not all interlocutors would agree with his conclusions. This difference between shared and personal probabilities, rather than a division based on "observable/non-observable results", is that which is proposed to determine the felicitous use of the APPARENT evidential (R_I, best-fit based on objective priors) and the ASSUMED (R_{SI},

best-fit based on personal priors). Due to the fact that this conclusion is not as clearly determined in the case of the ASSUMED, we have called this a "good-fit" rather than a best-fit, but the good-fit is a best-fit simply determined by alternate means, due to the fact that in the context, objective prior probabilities failed to be informative.

In terms of illocutionary reportative evidentials, the REPORTATIVE/HEARSAY and QUOTATIVE evidentials are expressions of (non-personal) best-fit explanations, similar to the APPARENT. The hearsay evidence relation R_H is the most source-like evidence relation, it is the only one discussed here where there is the type of the speaker's observation is made explicit (a previous assertion). The cancellation facts of the REPORTATIVE/HEARSAY (and QUOTATIVE) evidential that were so integral to many of the previous proposals discussed here, are analyzed here as pragmatically derived, that theses cases are those where a speaker has presented his explanation *as if* this inference had been made in a felicitous context. This equates this type of use of the reportative to those cases in which a speaker uses an inferential APPARENT evidential metaphorically.

We also saw that modeling the evidence relation of the reportative as having the same strength as R_I, an inference to a best-fit explanation with the same degree of uncertainty as the inferential APPARENT, gave insight into why many languages collapse these two "evidence source types" under a single evidential expression (e.g., perfects of evidentiality in Bulgarian and Turkish, and English *apparently/evidently*), and how some contexts are such that the R_H interpretation "arises". A summary of how uncertain explanation types are divided is given in Table 5.2.

		Non-personal Priors (Shared Priors Informative) (R_I, R_H)	*Personal Priors* (Shared Priors Uninformative) (R_{SI})
Observation-Specific?	No	APPARENT	ASSUMED
	Yes	REPORTATIVE/HEARSAY QUOTATIVE	

Table 5.2: Evidentials of Uncertainty: Informative Probability, Observation Specificity

We now have a typology of evidence, as it pertains to how the speaker-agent makes sense of the world, and expresses this in language (even when he remains to some degree that what he expresses is actually true). In order to predict that speakers will relay their most accurate evidence relation in discourse, we assume that a modified version of Faller's Evidential Maxim is present in any evidential discourse.

(353) EVIDENTIAL MAXIM – REVISED

Express the best-fit explanation of which you are the most certain, and any relevant sub-specifications given by your observation.

We do expect however (even though Matthewson et al. (2007) reports to the contrary), that there should be some type of pragmatic implicature that in the case of the ASSUMED, the speaker did not have the necessary informative objective priors to determine his explanation is best-fit explanation. The model does not predict that the APPARENT a subtype of the ASSUMED, as we see there are scenarios where the APPARENT is felicitous but the ASSUMED is not (e.g., mirative cases). Cases in which we do see overlap are easily explained, as in such cases personal and objective priors are simply equivalent. We expect that any scenario where we find felicitous uses of evidentials, the evidential expressed can be predictably determined by the combination of the evidence relation, the value of hearsay evidence H_O (if applicable), and the redefined evidential maxim as a guideline.

This is where the proposal stops in terms of modeling the semantics and pragmatics of evidentials; it is a model of the process in the speaker's mind up until the point of utterance. The model here is intended to stand as the foundation for future models of evidentials, such that they may make fewer assumptions prevent unnecessary redundancies. The proposal here devises a way to illustrate how evidentials form a natural semantic class; that they all carry the same basic expression of the evidence relation as their core meaning. We are now better-aware of what evidence is in terms of evidential expressions, that is not the case that the speaker has an evidence-source-type, that the speaker has made an inference to the best-fit explanation for what he observes, given what he knows to be true, and it is presupposed that this inference is valid given the circumstances. This is what makes evidentials distinct from other expressions that carry some type of evidence signal. By investigating the semantics of evidentials in this manner, the proposal here uncovers some very beautiful facts about the linguistic encoding of inference, evidence and how we communicate how we have made sense of the world around us.

Bibliography

Achinstein, P. (1983). *The Concept of Evidence*. Oxford: Oxford University Press.

Achinstein, P. (2003). *The Book of Evidence*. Oxford: Oxford University Press.

Adler, J. (1994). Testimony, trust, knowing. *Journal of Philosophy*, (91):264–275.

Aikhenvald, A. (2003). Evidentiality in typological perspective. In Aikhenvald, A. and Dixon, R., editors, *Studies in Evidentiality*. John Benjamins Publishing Company.

Aikhenvald, A. (2004). *Evidentiality*. Oxford: Oxford University Press.

Aikhenvald, A. and Dixon, R., editors (2003). *Studies in Evidentiality*. Amsterdam: John Benjamins.

Aksu-Koç, A. (2000). Some aspects of the acquisition of evidentials. In Johanson, L. and Utas, B., editors, *Evidentials: Turkic, Iranian and Neighbouring Languages.*, pages 15–28. Berlin: de Gruyter.

Aksu-Koç, A. and Slobin, D. (1986). A psychological account of the development and use of evidentials in Turkish. In Chafe, W. and Nichols, J., editors, *Evidentiality: The Linguistic Coding of Epistemology*. Norwood, NJ: Ablex.

Alchourrón, C. E., Gärdenfors, P., and Makinson, D. (1985). On the logic of theory change: Partial meet contraction and revision functions. *The Journal of Symbolic Logic*, (50):510–530.

Aliseda, A. (2006). *Abductive Reasoning: Logical explanations into discovery and explanation*, volume 330 of *Synthese Library Studies in Epistemology, Logic, Methodology, and Philosophy of Science*. Springer: Dortrecht, Netherlands.

Amsel, E. and Brock, S. (1996). The development of evidence evaluation skills. *Cognitive Development*, (11):523–550.

Aoki, H. (1986). Evidentials in Japanese. In Chafe, W. and Nichols, J., editors, *Evidentiality: The Linguistic Coding of Epistemology*. Norwood, NJ: Ablex.

Aronoff, M., editor (1992). *Morphology Now*. SUNY Press.

Austin, J. L. (1962). *How To Do Things With Words*. Cambridge: Harvard University Press.

Auwera, J. V. D. and Boye, K. (2008). Review of *Evidentiality*. *Language*, (84):170–173.

Bach, K. and Harnish, R. M. (1979). *Linguistic Communication and Speech Acts*. Cambridge, Mass.: MIT Press.

Baker, M. C. (1988). *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.

Banfield, A. (1973). Narrative style and the grammar of direct and indirect speech. *Foundations of Language*, (10):1–39.

Banfield, A. (1982). Unspeakable sentences. *London: Routledge*.

Barker, C. (2009). Clarity and the grammar of skepticism. *Mind and Language*, 24(3):253–273.

Barker, C. and Taranto, G. (2003). The paradox of asserting clarity. In Koskinen, P., editor, *Proceedings of the Western Conference on Linguistics (WECOL) 2002*, volume 14, pages 10–21. Fresco, CA: Department of Linguistics, California State University.

Barnes, J. (1984). Evidentials in the Tuyuca verb. *International Journal of American Linguistics*, (50):255–271.

Baron, J. (2000). *Thinking and Deciding*. New York: Cambridge University Press, 3rd edition.

Bergsland, K. (1997). *Aleut Grammar = Unangam Tunuganaan Achixaasix̂*. Fairbanks, AK: Alaska Native Language Center, University of Alaska.

Bittner, M. (2005). Future discourse in a tenseless language. *Journal of Semantics*, (22):339–387.

Bittner, M. (2009). Tense, mood, and centering. Rutgers, Ms.

Bittner, M. and Trondhjem, N. (2008). Quantification as reference: Kalaallisut Q-verbs. In Matthewson, L., editor, *Quantification: A Cross-Linguistic Perspective*, volume 64 of *North-Holland Linguistic Series: Linguistic Variations*. Elsevier Science.

BonJour, L. (2011). Epistemological problems of perception. In Zalta, E. N., editor, *The Stanford Encyclopedia of Philosophy*. Summer 2011 edition edition.

Broad, C. (1952). *Ethics and the History of Philosophy*. New York: Humanities Press.

Bronnikov, G. (2008). The paradox of clarity: Defending the missing inference theory. In Friedman, T. and Ito, S., editors, *Proceedings of SALT XVIII*. Ithaca, NY: Cornell University.

Casad, E. (1984). Cora. In Langacker, R., editor, *Southern Uto-Aztecan Grammatical Sketches*, pages 151–459. Dallas: Summer Institute of Linguistics and University of Texas at Austin.

Chafe, W. (1986). Evidentiality in English conversation and academic writing. In Chafe, W. and Nichols, J., editors, *Evidentiality: The linguistic coding of epistemology*. Norwood, NJ: Ablex.

Chafe, W. and Nichols, J., editors (1986). *Evidentiality: The linguistic coding of epistemology*. Norwood, NJ: Ablex.

Charney, J. (1993). *A Grammar of Comanche*. Lincoln and London: The University of Nebraska Press.

Choo, A. L.-T. (1996). *Hearsay and Confrontation in Criminal Trials*. Clarendon Press.

Chung, K. (2005). *Space in Tense: The interaction of Tense, Aspect, Evidentiality and Speech Acts in Korean*. PhD thesis, Simon Fraser University.

Chung, K.-S. (2006). Toward an integrated theory of the perfect and the indirect evidential. In Davis, C., Deal, A. R., and Zabbal, Y., editors, *Proceedings of the 36th NELS*. Amherst, MA: University of Massachusetts.

Cieri, C., Miller, D., and Walker, K. (2004). The fisher corpus: A resource for the next generations of speech-to-text. In *LREC 2004: Fourth International Conference on Language Resources and Evaluation, Lisbon*.

Cinque, G. (1999). *Adverbs and Functional Heads: A cross-linguistic perspective*. Oxford: Oxford University Press.

Comrie, B. (1976). *Aspect: An introduction to the study of verbal aspect and related problems*. Cambridge: Cambridge University Press.

Dascal, M. (1979). Conversational relevance. In Margalit, A., editor, *Meaning and Use*, pages 153–174. Dordrecht: Reidel.

Davis, C., Potts, C., and Speas, P. (2007). The pragmatic values of evidential sentences. In *SALT proceedings*.

De Haan, F. (1999). Evidentiality and epistemic modality: Setting boundaries. *Southwest Journal of Linguistics*, 18:83–101.

de Reuse, W. J. (2003). Evidentiality in Western Apache (Athabaskan). In Aikhenvald, A. and Dixon, R., editors, *Studies in Evidentiality*. John Benjamins Publishing Company.

DeLancey, S. (2001). The mirative and evidentiality. *Journal of Pragmatics*, (33):369–382.

Delancy, S. (1997). Mirativity: The grammatical marking of unexpected information. *Linguistic Typology*, 1(1):33–52.

Dickinson, C. (1999). Semantic and pragmatic dimensions of Tsafiki evidential and mirative markers. In *CLS 35. The Panels*, pages 29–44.

Dickinson, C. (2000). Mirativity in Tsafiki. *Studies in Language*, (24):379–422.

Donaldson, T. (1980). *Ngiyambaa*. Cambridge: Cambridge University Press.

Douven, I. (2011). Abduction. In Zalta, E. N., editor, *The Stanford Encyclopedia of Philosophy*. Spring 2011 edition edition.

Egan, A. (2006). Epistemic modals, relativism and assertion. *Philosophical Studies*, 133:1–22.

Fabricius-Hansen, C. and Saebø, K. J. (2004). In a mediative mood: The semantics of the German reportive subjunctive. *Natural Language Semantics*, 12:213–257.

Faller, M. (2002). *Semantics and Pragmatics of Cuzco Quechua*. PhD thesis, Stanford University.

Fienup-Riordan, A. and Kaplan, L., editors (2007). *Words of the Real People: Alaska native literature in translation*. University of Alaska Press, Fairbanks, AK.

Flaten, E. (2009). Turkish evidentials: Source-of-information, mismatches and non-matches. Ms.

Floyd, R. (1999). The structure of evidential categories in Wanka Quechua. *Summer Institute of Linguistics (Publications in Linguistics)*, 131.

Forestcue, M. (1984). *West Greenlandic*. London: Croom Helm.

Fortescue, M. (2003). Evidentiality in West Greenlandic. In Aikhenvald, A. and Dixon, R., editors, *Studies in evidentiality*, pages 291–307. Amsterdam: John Benjamins.

Fricker, E. (1994). Against gullibility. In Matilal, B. K. and Chakrabarti, A., editors, *Knowing from Words*, pages 125–161. Dordrecht: Kluwer.

Friedman, V. (1986). Evidentiality in the Balkans: Bulgarian, Macedonian, and Albanian. In Chafe, W. and Nichols, J., editors, *Evidentiality: The Linguistic Coding of Epistemology*, pages 168–187. Norwood, NJ: Ablex.

Gärdenfors, P. (1988). *Knowledge in Flux: Modeling the dynamics of epistemic states*. Cambridge, MA: The MIT Press, Bradford Books.

Gärdenfors, P. (1992). Belief revision: An introduction. In Gärdenfors, P., editor, *Belief Revision*. Cambridge: Cambridge University Press.

Garrett, E. (2001). *Evidentiality and assertion in Tibetan*. PhD thesis, UCLA.

Gettier, E. (1963). Is justified true belief knowledge? *Analysis*, (23):121–123.

Ginzburg, J. (1996). Interrogatives: Questions, facts, and dialogue. In Lappin, S., editor, *The Handbook of Contemporary Semantic Theory*, pages 385–422. Oxford: Blackwell Publishers.

Glanze, W. and Mosby, C. (1994). *Mosby's Medical, Nursing and Allied Health Dictionary*. Mosby, Inc., 4th edition edition.

Grice, H. P. (1975). Logic and conversation. In Cole, P. and Morgan, J., editors, *Speech Acts, Syntax and Semantics*, volume 3, pages 41–58. New York: Academic Press.

Grivičić, T. and Nilep, C. (2004). When phonation matters: The use and function of *Yeah* and creaky voice. *Colorado Research in Linguistics*, 17(1).

Groopman, J. (2007). *How Doctors Think*. Houghton Mifflin Company.

Gunlogson, C. (2001). *True to Form: Rising and Falling Declaratives as Questions in English*. PhD thesis, University of California Santa Cruz.

Haan, F. D. (2001). The place of inference in the evidential system. *International Journal of American Linguistics*, 67(2):193–219.

Hacking, I. (1975). *The Emergence of Probability*. Cambridge: Cambridge University Press.

Hamblin, C. (1973). Questions in Montague English. *Foundations of Language*, 10:41–53.

Harman, G. (1965). The inference to the best explanation. *Philosophical Review*, (74):88–95.

Hawthorne, J. (2011). Inductive logic. In Zalta, E., editor, *The Stanford Encyclopedia of Philosophy*. Winter 2011 edition.

Hobbs, J. (2004). Abduction in natural language understanding. In Horn, L. and Ward, G., editors, *Handbook of Pragmatics*, pages 724–741. Blackwell.

Huemer, M. (2011). Sense-data. In Zalta, E. N., editor, *The Stanford Encyclopedia of Philosophy*. Spring 2011 edition edition.

Ifantidou, E. (2001). *Evidentials and Relevance*. Benjamins, Amsterdam.

Izvorski, R. (1997). The present perfect as an epistemic modal. In *Proceedings of SALT VII*, pages 222–239.

Jacobson, S. (1984). *Yup'ik Eskimo Dictionary*. Alaska Native Language Center Publications, University of Alaska, Fairbanks.

Jacobson, S. (1995). *A Practical Grammar of the Central Alaskan Yup'ik Eskimo Language*. Alaska Native Language Center Publications, University of Alaska, Fairbanks.

Kaplan, D. (1989). Demonstratives: An essay on the semantics, logic, metaphysics, and epistemology of demonstratives and other indexicals. In Almog, J., Perry, J., and Wettstein, H., editors, *Themes from Kaplan*, pages 481–614. New York: Oxford University Press.

Klinedinst, N. (2005). Plurals, possibility, and conjunctive disjunction. In *Proceedings of Sinn und Bedeutung 10*.

Kratzer, A. (1981). The notional category of modality. In Eikmeyer, H.-J. and Rieser, H., editors, *Words, Worlds and Contexts*, pages 38–74. Berlin: Walter de Gruyter.

Kratzer, A. (1991). Modality. In von Stechow, A. and Wunderlich, D., editors, *Semantics: An International Handbook of Contemporary Research*, pages 639–650. de Gruyter.

Krawczyk, E. (2009b). Towards a typology of evidence promotion: A cross-linguistic survey of evidential systems and evidence. Ms. Georgetown University.

Krawczyk, E. (2010). Evidently, a dilemna. In *Proceedings of SULA 5: Semantics of Under-Represented Languages in the Americas.*

Lazard, G. (2001). On the grammaticalization of evidentiality. *Journal of Pragmatics*, (33):359–367.

Lewis, D. (1973). Counterfactuals and comparative possibility. *Journal of Philosophical Logic*, 2(4):418–446.

Lewis, D. (1981). Ordering semantics and premise semantics for conditionals. *Journal of Philosophical Logic*, 10(2):217–234.

Lipton, P. (1998). The epistemology of testimony. *Studies in History and Philosophy of Science*, 29:1–31.

Lipton, P. (2001). *Inference to the Best Explanation*. Routledge: London.

Matthewson, L. (1999). On the interpretation of wide-scope indefinites. *Natural Language Semantics*, (7):79–134.

Matthewson, L. (2005). *When I was Small - I Wan Kwikws: Grammatical analysis of St'át'imcets oral narratives*. Vancouver, BC: UBC Press.

Matthewson, L. (2010). What are direct evidentials? In *Presentation, Evidentials Fest, Ohio State University*.

Matthewson, L., Davis, H., and Rullman, H. (2007). Evidentials as epistemic modals: Evidence from St'át'imcets. In *Linguistic Variation Yearbook*, volume 7.

McCready, E. (2008). Semantic heterogeneity in evidentials. In Satoh, K., Inokuchi, A., Nagao, K., and Kawamura, T., editors, *New frontiers in artificial intelligence: JSAI 2007 conference and workshops revised selected papers*, number 4914 in Lecture Notes in Computer Science, pages 81–94. Berlin: Springer.

McCready, E. (2010). Evidential universals. In Peterson, T. and Sauerland, U., editors, *Evidence From Evidentials*, volume 28 of *University of British Columbia Working Papers in Linguistics (UBCWPL)*, pages 105–128.

McCready, E. and Asher, N. (2006). Modal subordination in Japanese: Dynamics and evidentiality. In Eilam, A., Scheer, T., and Tauberer, J., editors, *Penn Working Papers in Linguistics 12.1*, pages 237–249.

McCready, E. and Ogata, N. (2007). Evidentiality, modality and probability. *Linguistics and Philosophy*, 30(2):147–206.

McLendon, S. (2003). Evidentials in Eastern Pomo with a comparative survey of the category in other Pomoan languages. In Aikhenvald, A. and Dixon, R., editors, *Studies in Evidentiality*, pages 101–130. Amsterdam: John Benjamins.

Mithun, M. (1986a). *Evidential diachrony in Northern Iroquoian*. Norwood, NJ: Ablex.

Mithun, M. (1986b). Introduction. In Mithun, M., editor, *Prosody, Grammar and Discourse in Central Alaskan Yup'ik*, volume 7 of *Santa Barbara Papers in Linguistics*. Santa Barbara, CA: UCSB.

Mithun, M. (2001). *The Languages of Native North America*. Cambridge: Cambridge University Press.

Miyaoka, O. (1996). Sketch of Yup'ik, an Eskimo language. In *Handbook of the North American Indians*, volume Volume 17: Languages. Washington, DC: Smithsonian.

Mortelmans, T. (2000). On the evidential nature of the epistemic use of the German modals 'mussen' and 'sollen'. In van der Auwera, J. and Dendale, P., editors, *Modal verbs in Germanic and Romance languages*, volume 14 of *Belgian Journal of Linguistics*, pages 131–148. Benjamins, Amsterdam.

Murray, S. (2010). *Evidentials and the Structure of Speech Acts*. PhD thesis, Rutgers.

Oshima, D. (2006). *Perspectives in Reported Discourse*. PhD thesis, Stanford University.

Oswalt, R. (1986). The evidential system of Kashaya. In Chafe, W. and Nichols, J., editors, *Evidentiality: The linguistic coding of epistemology*, pages 29–45. Norwood, NJ: Ablex.

Ozturk, O. and Papafragou, A. (2007). Children's acquisition of evidentiality. In *Proceedings from the 31st Annual Boston University Conference on Language Development*.

Palmer, F. (2001). *Modality*. Cambridge: Cambridge University Press.

Palmer, F. R. (1986). *Mood and Modality*. Cambridge: Cambridge University Press.

Papafragou, A., Li, P., Choi, Y., and Han, C. (2005). Evidentiality in language and cognition. *Cognition*, (103):253–299.

Papafragou, A. and Ozturk, O. (2008). The acquisition of evidentiality and source monitoring. In Somerville, M. C. P., editor, *Proceedings from the 32nd Annual Boston University Conference on Language Development.*

Partee, B. (1973). The syntax and semantics of quotation. In Anderson, S. R. and Kiparsky, P., editors, *A Festschrift for Morris Halle*, pages 410–418. New York: Holt, Reinhart and Winston.

Peirce, C. P. (1931-1958). *Collected Papers of Charles Sanders Peirce*, volume vols. 1–6, 1931–1935, Charles Hartshorne and Paul Weiss, eds., vols. 7–8, 1958, Arthur W. Burks, ed. Harvard University Press, Cambridge, MA.

Peterson, T. (2010). Examining the mirative and nonliteral uses of evidentials. In Peterson, T. and Sauerland, U., editors, *Evidence From Evidentials*, volume 28 of *University of British Columbia Working Papers in Linguistics (UBCWPL)*, pages 129–160.

Peterson, T. and Sauerland, U., editors (2010). *Evidence From Evidentials*, volume 28 of *University of British Columbia Working Papers in Linguistics (UBCWPL).*

Pollock, J. and Cruz, J. (1999). *Contemporary theories of knowledge.* Rowman Littlefield.

Popper, K. (1959). *The Logic of Scientific Discovery.* Hutchinson: London.

Popper, K. (1963). *Conjectures and Refutations: The growth of scientific knowledge.* Routledge: London.

Portner, P. (2006). Comments on Faller's paper. Presented at the Workshop on Philosophy and Linguistics at the University of Michigan, November 3-5, 2006.

Portner, P. (2007). Beyond the common ground: The semantics and pragmatics of epistemic modals. In Yoon, J.-Y. and Kim, K.-A., editors, *The Perspectives of Linguistics in the 21st Century.* Seoul: Hankook Publishing Company.

Portner, P. (2009). *Modality.* Oxford University Press.

Potts, C. (2005). *Logic of Conventional Implicatures*. Oxford: Oxford University Press.

Potts, C. (2006). Clausal implicatures via general pragmatic pressures. In McCready, E., editor, *Proceedings of Logic and Engineering of Natural Language Semantics 2006*. Japan Society for the Promotion of Science, Tokyo.

Potts, C. (2007). The dimensions of quotation. In Barker, C. and Jacobson, P., editors, *Direct Compositionality*, pages 405–431. Oxford University Press.

Reinhart, T. (1997). Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and Philosophy*, 20:335–397.

Robinson, E. and Whitcombe, E. (2003). Children's suggestibility in relation to their understanding about sources of knowledge. *Child Development*, (74):48–62.

Rooryck, J. (2001). Evidentiality: Part I. *GLOT*, 5(4):125–133.

Schenner, M. (2008). Semantics of evidentials: German reportative modals. In *Proceedings of ConSOLE XVI*, pages 179–198.

Schenner, M. (2010). Evidentials in complex sentences: foundational issues and data from Turkish and German. In Peterson, T. and Sauerland, U., editors, *Evidence From Evidentials*, volume 28 of *University of British Columbia Working Papers in Linguistics (UBCWPL)*.

Schum, D. (1994). *The Evidential Foundations of Probabilistic Reasoning*. J. Wiley.

Searle, J. (1969). *Speech Acts: An essay in the philosophy of language*. Cambridge: Cambridge University Press.

Sellman, T. (1996). Yup'ik evidentials: The narrative function of *=gguq* and *-llini-*. In Mithun, M., editor, *Prosody, Grammar and Discourse in Central Alaskan Yup'ik*, volume 7 of *Santa Barbara Papers in Linguistics*. Santa Barbara, CA: UCSB.

Shafer, G. (1976). *A Mathematical Theory of Evidence*. Princeton University Press.

Sharvit, Y. (2008). The puzzle of free indirect discourse. *Linguistics and Philosophy*, 31:353–395.

Sotos, J. G. ((2006) [1991]). *Zebra Cards: An Aid to Obscure Diagnoses.* Mt. Vernon, VA: Mt. Vernon Book Systems.

Stalnaker, R. (1978). Assertion. In Cole, P., editor, *Syntax and Semantics 9: Pragmatics*, pages 315–332. New York: Academic Press.

Stalnaker, R. (1981). A theory of conditionals. In Rescher, N., editor, *Studies in Logical Theory*, pages 98–112. Oxford: Basil Blackwell Publishers.

Sun, J. (1993). Evidentials in Amdo Tibetan. In *The bulletin of the institute of history and philology*, volume LXIII, Part IV, pages 945–1001. Academia Sinica.

Taranto, G. (2006). *Discourse Adjectives*. Routledge.

Valenzuela, P. (2003). Evidentiality in Shipibo-Konibo, with a comparative overview the category in Panoan. In Aikhenvald, A. and Dixon, R., editors, *Evidentiality in Typological Perspective*, pages 33–62. John Benjamins Publishing Company.

Veltman, F. (1996). Defaults in update semantics. *Journal of Philosophical Logic*, 25(3):221–261.

Vickers, J. (2010[2011]). The problem of induction. In Zalta, E., editor, *The Stanford Encyclopedia of Philosophy*. Fall 2011 edition.

von Fintel, K. (2004). Would you believe it? the King of France is back! presuppositions and truth-value intuitions. In Reimer, M. and Bexuidenhout, A., editors, *Descriptions and Beyond*, number 269-296. Oxford: Oxford University Press.

von Fintel, K. and Gillies, A. S. (2007). An opinionated guide to epistemic modality. In Gendler, T. S. and Hawthorne, J., editors, *Oxford Studies in Epistemology*, volume 2, pages 36–62. Oxford: Oxford University Press.

von Fintel, K. and Gillies, A. S. (2010). Must... stay... strong! *Natural Language Semantics*, 18(4):351–383.

Walton, D. (2004). *Abductive Reasoning*. University of Alabama Press.

Whitcombe, E. and Robinson, E. (2000). Children's decisions about what to believe and their ability to report the source of their belief. *Cognitive Development*, 15:329–346.

Willet, T. L. (1988). A cross-linguistic survey of the grammaticalization of evidentiality. *Studies in Language*, 12:51–97.

Williamson, T. (2000). *Knowledge and its Limits*. Oxford University Press.

Winter, Y. (1997). Choice functions and the scopal semantics of indefinites. *Linguistics and Philosophy*, 20:399–467.

Wirth, U. (1998). What is abductive inference? In Bouissac, P., editor, *Encyclopedia of Semiotics*. Oxford University Press.