ABSTRACT

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Can anything that can be said in one language be translated, without loss of meaning, into any other? Katz, inspired by Frege and others, argued for an affirmative answer to this question and proposed a Principle of Translatability. Since then, this alleged principle has come under scrutiny from linguists, who have proposed a number of counterexamples. While the consequences for Katz's exact formulation of his principle are severe, the interpretation of the empirical data is often difficult and it is unclear whether slightly weaker principles may obtain. In my dissertation, I examine the literature discussing translatability and argue that it has suffered from a lack of precision regarding key terms, especially meaning and language. I propose that putting the question of translatability in terms of what Chomsky called I-languages allows better theoretical traction, although the exact question that we end up with looks very different from the one that we started with.

PHILOSOPHY AND TRANSLATABILITY

by

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Dedicated to the Memory of

Zimri Allen Enos

1941-2008

“The truly educated never graduate."

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Chapter 0: Introduction and Plan of the Dissertation

Quid est ergo…? Si nemo ex me quaerat, scio; Si quaerenti explicare velim, nescio.
-St Augustine of Hippo

§0. Introduction, Themes and Questions

Translation is a common activity; indeed, it is a quotidian fact of life for much of the world's population. Yet, when one stops to ponder it carefully, it is a mysterious process, fraught with difficult philosophical issues. What is it, exactly, to map sentences of one language, the *source language* (SL) into sentences of a *target language* (TL) that have the same meaning? Searching for an answer to this question leads directly to problems that cut to some of the deepest enigmas of human language. What is this property, *meaning*, that must be preserved under translation? When do two words, sentences, or texts in different languages (or in the same language, for that matter) have identical meanings? Are all languages fully translatable into one another, or, to put it more precisely, can any sentence of any language be rendered into any other language without loss of meaning? How can this question even be asked, let alone investigated in a rigorous way given that languages are infinite, overlapping and constantly changing? For the matter, what is *a language*? It seems that St Augustine's famous observation about time is equally applicable to translation: "What is it…? If no one asks me, I know; but if someone asks me to explain, then I do not know".

This dissertation is an investigation into a single one of these questions: is it a property of natural human languages (NLs) that any meaning that can be expressed in any one of them can be expressed, perhaps with some degree of circumlocution, in any other? This seems a very natural question to ask, and speculation on the relative *expressive power*, the capacity to say things about the world, of various languages has a certain perennial fascination. Witness the vast

number of antecedental (and generally quite dubious) examples of untranslatable vocabulary that can be turned up by a quick internet search: there is no word for *war* in Innuit, no word for *snow* in Arabic, no word for *schadenfreude* in English[1]. A moment's reflection, however, shows that, even when true, these sorts of cases are really beside the point, as the question we are concerned with is whether a concept, e.g., *pleasure at another's misfortune*, can be expressed in all languages; that it might take four words in English and one in German is not particularly relevant.

More sophisticated examples are not hard to come by. For instance, can any combination of English words capture exactly the range of meanings expressed by the French pronouns *tu* and *vous*, which indicate the speaker's social position relative to the addressee? We might try a definition- e.g., *like "you", but with the implication that the addressee is of a lower social class*- but then we still face the problem of equivalence at the sentence level, which is where most scholarly discussion of expressive power concentrates. If we have a French sentence containing *tu*, it seems doubtful that we can come up with an equivalent English sentence by using an unwieldy definition in the place of the second-person pronoun. On the other hand, we might feel that the fault is with us and not the English language. Perhaps a sufficiently skilled translator would be able to find a better solution and produce an equivalent sentence.

[1] A list of the "No Word for X" memes can be found at https://languagelog.ldc.upenn.edu/nll/?p=1081, filed under *snowclones*, which is itself a reference to the popular story that Innuit languages have hundreds of words for snow. This story is widely cited in the popular press, invariably without citation, but it is widely derided as an urban legend; Pullam (1989) famously labelled it the "Great Eskimo Vocabulary Hoax". However, there appears to be a great deal more truth to the story than is generally allowed for: Larry Kaplan, an authority on Native Alaskan languages, states that "An extensive vocabulary exists for both snow and ice…linguists and others familiar with these languages have always taken it for granted that there is extensive vocabulary for the areas in question" (Kaplan 2003). He declined to provide an exact number, noting the difficulties with providing a word count for highly polysynthetic languages. This story is not only amusing because it is an example of a Gettier case, but it also demonstrates that when discussing crosslinguistic variation, one must approach "what everyone knows" with caution.

When we turn from off-the-cuff speculations to the scholarly literature on the topic, we find a fascinating variety of cases in which one language is said to have gaps relative to another (almost always English). We are told that Nez Perce has no way of expressing *must* (Deal 2011), that Pirahã has no universal quantifier words such as *all* (Everett 2005), that traditional Warlpiri has no numbers (Hale 1975), that Kalaallisut has no way of referring directly to future events (Bittner 2005), that Tzeltal cannot express direction relative to the speaker (Bloom and Keil 2001), that Maricopa has none of the connectives of classical logic (Gil 1991), and that sentences in St'at'imcets do not carry presuppositions (Matthewson 2006). In each case, it is asserted that some range of sentences can be produced in the SL which have no equivalent in the TL.

Despite this array of challenges, a number of prominent figures in philosophy and linguistics have defended the idea that all NLs have equivalent expressive power, a theory I will refer to as *translatability*[2]. Let us define this conjecture as follows:

> **Translatability:** For *any* sentence of *any* natural language, in every other natural language there is *some* sentence that expresses the same meaning.

Another way of framing things is that if translation is viewed as a function taking us from sentences of the SL to sentences of the TL in such a way that meaning is preserved, the mapping function will always be a *total* one. This hypothesis has been advocated by Frege (1892,1961), Sapir (1924), Jakobson (1954), and at by far the most length by Jerrold Katz (1972), as well as several others who will be discussed in future chapters. The question of whether this hypothesis does, in fact, obtain, is the subject matter of this dissertation; the investigation of the evidence

[2] At times this term will be used to discuss a relation between a pair of languages, and at other times to refer to the hypothesis that this property obtains between all NLs. It should be clear from context which use is intended, but if there is any possibility of confusion, I will instead speak of *translatability between x and y* or *universal translatability* as appropriate. When I speak of the study, or investigation, of translatability, I am referring to the entire field of inquiry involved in trying to resolve whether this hypothesis obtains.

and its interpretation is absolutely fascinating, but we will see that at the end of the day the question is simply not a well posed one.

Before moving on with the discussion, a first preliminary that must be addressed is the distinction between translatability, which is, as just defined, a theory concerning the meanings that can be expressed by the sentences in languages, and what we will call *communicability*[3].

> **Communicability**: For any meaning expressed by any sentence of any natural language, a speaker of any other language can express the same meaning.

In other words, translatability -as understood by the major participants in the discussion of this hypothesis, especially Katz- concerns sentence meanings; communicability concerns the all-things considered ability of agents to get their point across. It should be clear that the expressive resources of a speaker vastly outstrip the sentences they have available, whether they are communicating withing a single language or across languages. For instance, a speaker might gesture ostensibly (e.g., pointing to objects that the TL has no name for), use tone of voice, pantomime, drawings, diagrams, or special purpose symbols. It seems fairly clear that we would like to disregard these as falling outside of the question we are concerned with, that is, a "translation" that relied on such methods would not count as evidence for translatability. On the other hand, there are cases where this is not so clear, for instance, the metaphorical use of expressions to convey a recalcitrant meaning, reference to the context of the discourse, or an appeal to shared cultural knowledge (e.g., Iraqi Arabic speakers and English speakers use the expression *Ali Baba* to indicate a criminal, relying on the fact that the story associated with the name is known across language lines). In between is an enormous penumbra. In what follows,

[3] In this definition, and throughout the discussion, *speaker* also means *signer*, *writer*, or any other type of language using agent; the use of *speaker* to subsume all of these cases is merely for brevity.

we will see that is often difficult to clearly maintain a principled difference, and in the end the distinction largely collapses. This is a first indication that the question of translatability, as traditionally understood, may need to be revised.

In any case, any discussion of translatability must face two of the most difficult questions in the study of language, that of the specification of *meaning*, and of the individuation of *natural languages*. Surprisingly, we will see that these considerations, especially the second one, have often been treated somewhat cavalierly.

Concerning *meaning*, there has been general agreement that translatability is a hypothesis about sentence meaning, rather than about individual words or units larger than the individual sentence[4]. This is for several reasons: (i) it is glaringly obvious that the vocabulary of languages are very seldom in one-to-one correspondence, immediately ruling out translatability in the sense of individual word meanings, (ii) it is very difficult to formally define meaning for units larger than the sentence, and (iii) the contemporary discussion of the issue was initiated by Katz (1972), who framed it in terms of the propositions expressed by sentences. There is also general agreement, at least since Katz (1976), that translatability concerns the *semantic* aspects of meaning only, that is, the properties assigned to a sentence by a formal theory of semantics in virtue of the meaning of the words contained and the way that they are composed. Therefore, it is commonly held that *connotations*, such as insulting implications (e.g., the difference between a racial slur and a neutral description) might be important considerations for actual practicing

[4] This is true among philosophers and linguists; the situation is otherwise in translation studies, where the unit of concern is usually entire texts (Steiner 1975; Pym and Turk 2008). The sense of *meaning* of interest to scholars of translation studies is generally much broader than what we are concerned with, involving cultural, literary, and aesthetic considerations that must be taken into account in the interpretation of texts, and where subjective judgement is inevitable.

translators, but do not need to be considered when discussing translatability, along with any other aspects of utterances that might be broadly assigned to pragmatics.

Of course, there are many, often competing, theories of semantics on offer that give differing accounts of what properties of a sentence are constitutive of its meaning. In the literature on translatability, at least since Katz (1972) and Keenan (1974) there has been a focus on truth conditions and entailment relations with other sentences as minimal properties whose preservation is a *necessary*, if not always sufficient (consider the case of tautologies), condition for translation. That is to say, for a TL sentence to count as a translation of an SL sentence, it must at least be true under the same conditions and entail the same further sentences in the relevant language (e.g., if φ entails ψ, then the TL equivalent of φ must entail the TL equivalent of ψ).

This focus on entailments and truth conditions has provided enough common ground between authors to allow discussion of translatability without participants completely speaking past one another. We might question whether a semantic theory that relies on formal sentence meaning, considered in abstraction from context of use or speaker intentions, is the most interesting tool for the investigation of translation. In addition, we will observe in what follows that like the related distinction between communicability and translatability, the distinction between semantics and pragmatics is often difficult to clearly discern in particular cases. But in any case we will find that in the end these concerns will become irrelevant, because this view of linguistic meaning, as consisting of formal properties of sentences, is tied to a particular understanding of language as a publicly accessible entity external to any speakers, which we will see is untenable, at least as far as the discussion of translatability.

This brings us to the other concern which is central to the investigation of translatability, that is, what constitutes *a language*. This is obviously of prime importance to what is supposed to be a question about the expressive power of languages, since we would like to know exactly what the entities under discussion are. Most authors involved have worked with an intuitive, or folk, understanding that essentially amounts to a body of customs observed by a given population. A few of the key protagonists, notably Katz (1972,1981) have defined a language as an abstract mathematical object, a set of sentences. Both of these are specimens of what Chomsky (1986) calls an *E-language*, or *external* language. This treatment of languages is adequate for many purposes, even in the philosophy of language and scientific linguistics. However, public languages are resistant to precise individuation conditions, which is problematic for the discussion of translatability. If we are not clear on how languages are to be identified and to be discerned from one another, we cannot make principled decisions about the expressive power of one of them, as compared to another. In the end, this suggests that we should search for an alternative approach to defining languages, and fortunately one is available, Chomsky's theory of the *I-language*, or a computational device internal to the mind of a speaker. However, as we will see, shifting the investigation of translatability into I-language terms will change many aspects of the original question.

In what follows, we will tour the literature on translatability, discussing things largely in the terms used by the original authors involved, that is, E-languages and the semantic properties of sentences. This is, in and of itself, an interesting tour through a corner of the history of philosophy and a collection of fascinating crosslinguistic studies. But the real scholarly interest is in the points where this research program breaks down, pointing us towards a better way of

proceeding. In the study of translatability we must follow Wittgenstein's advice and throw away the ladder one we have climbed it.

§1 The Plan

This section is a high-level plan of the dissertation. At the beginning of each chapter there will be a more detailed mapping of that chapter's contents.

Before embarking on the plan, it is worth reiterating a point concerning definitions and the use of key vocabulary. Discussion of translatability is inextricably intertwined with issues involving the correct way to define *language*, *languages* and *meaning*. Throughout the expository chapters I, II and III, where I am discussing the views of various authors, they are to be understood as using their own definitions, or, more often, as leaving things undefined and relying on intuitive notions. I will not attempt to impose a standard usage, and I will confine myself to noting how the various characterizations of language and meaning differ and sometimes entail different conclusions, and pointing out when they become problematic. As outlined in the previous section, I will reserve extended discussion of what I take to be the proper definitions for the final chapter of the dissertation. This is for the sake of framing the discussion, and should not be taken as an endorsement of any of the views on language or meaning presented in the first three chapters.

In chapter I, I will examine translation between some of the formal languages used in the study of logic. As detailed in the previous section, translatability is a murky subject beset by definitional issues, and it may seem unclear exactly what it would mean for translatability to hold or fail between two languages. I will therefore begin by appealing to the relative clarity of formal languages in order to provide some illumination. This allows a precise definition of translation as

a mapping between languages defined as sets of formulas, in such a way as to preserve the entailment relations among these formulas that are given by the semantics stipulated for the given languages. An additional advantage for formal languages is that their semantics are defined extensionally, which sidesteps many thorny problems that beset work on natural language meaning. We can then survey some cases were full transability clearly obtains, as well as some where it fails.

However, even at the level of formal languages we will see that there are many definitions available for *translation*, with translatability holding or failing for different pairs of languages depending on the standard adopted. Thus, we find that there are already issues concerning exactly what definition of translation to endorse, and the exact limits of translation will vary depending on the choice we make. This discussion should be interesting in its own right (a reader not independently interested in logic should feel free to skip over about half the chapter, the relevant cut-off will be indicated), but also because it will serve to provide some insight into matters that will reappear later, during the discussion of NLs

Chapter II will turn to natural human languages. Our point of departure in this study will be Katz (1972,1976,1978) who argued that translatability is a consequence of psychological, and ultimately biological, traits common to all humans. Katz is a convenient starting point for two reasons: first, his proposals initiated the discussion of translatability in the framework of modern (i.e., after the appearance of Chomsky) linguistics, and second because he was unique in taking care to provide precise definitions of at least some aspects of the issue. Katz introduced a *Principle of Translatability*, ***T***, which is a more precise statement of our hypothesis of translatability (see page 5). ***T*** will be a reference point in everything to follow.

In Chapter II, I will outline the history of translatability prior to Katz, discussing Sapir, Jakobson, Frege, Searle and Tarski and their contributions. I will then summarize Katz's own arguments and their basis in the theory of *effability*, the hypothesis that human languages have adequate expressive resources to articulate any proposition (space will prohibit fully examining this rather bold proposal other than its implications for translatability). Following this, Katz's most outspoken adversary, the linguist Edward Keenan, will be introduced, along with a broad overview of his initial criticisms (Keenan 1974,1976,1978). Next, I will take a theoretical turn and examine the conception of a language as a set of sentences, endorsed by both Katz and Keenan, and how this concept fits with their relative views on translatability. Even at this early stage in the discussion we will begin to encounter difficulties with the E-language view, although we will see that some of these can be ameliorated by treating translatability as ranked on a hierarchy, rather than as an all-or-nothing relation. Finally, I will set the stage for the next chapter by discussing the broad categories of counterexamples to translatability found in the work of Keenan and others, with an extensive discussion of presuppositions. Katz's definition of synonymy requires that synonymous sentences have exactly the same entailments, and this is to include the original division of entailed content into what is presupposed and what is directly asserted. The most frequently proposed sort of counterexample are cases where for some sentence, the best available translation into the target language cannot meet his requirement.

Chapter III will involve a tour of the empirical data. I will begin with Keenan's responses to Katz, which involved the sort of problems, concerning presuppositions, just mentioned. Next I will discuss Lisa Matthewson (1999,2006), who conducted extensive fieldwork on Salish languages and provided further counterexamples to ***T***, again at the level of presuppositions. I then survey Amy Rose Deal's careful and convincing work on translatability (2011), which

argues that Nez Perce has an expressive gap relative to English, as it has no way of expressing deontic necessity (i.e., *must* in the normative sense). This counterexample is especially interesting, as it does not hinge on presuppositions, and therefore counts against principles of translatability that are weaker than Katz's ***T*** in terms of the requirements for successful translation. A few further cases of interest will be discussed, including the relation of English to Yaqui (concerning modal verbs), Kalaallisut (tense), Tzeltal (directions) and Maricopa (logical connectives). Finally, Everett's claim that Pirahã is "incommensurable" with other languages (2005,2007,2009), will be examined at some length, more because of the attention his work has received than on its merits.

A lesson that we will be able to draw from all of this is that ***T*** is not a credible hypothesis, and there is considerable evidence against even much weaker principles of translatability. Yet when one attempts to make these results more precise, difficulties emerge. This is because, as indicated in §0, the way in which some of the key notions of the discussion have been defined, or left undefined, is inappropriate for the analysis of translatability

In Chapter IV, it will be high time to throw away the ladder, and I will turn to discussing the main lessons that can be extracted from the preceding chapters. I will use some of the cases discussed in Chapter III to argue in more detail for the conclusions mentioned above in §0 regarding the unsuitability of E-languages for the task at hand, and advocate that the question should be recast in terms of I-languages, their possible configurations, and the constructions that they generate This will allow a comparison of the classes of linguistic structures, used in the production of sentences, that can be produced by various configurations of I-languages, which appear to be finite in number and differ from one another in systematic ways. There is therefore

still an interesting question to be asked in terms of how the various configurations of I-languages facilitate and constrain the expression of meanings.

In reading over this rough plan, a reader may be puzzled by the near absence of Quine and Davidson from a philosophical dissertation on translation. While these are certainly profound thinkers who produced an interesting and challenging body of work in the near vicinity of my topic, at the end of the day they were simply interested in a different question. Indeterminacy of translation, in the sense these authors were investigating, concerned the availability of alternative sets of meanings for the sentences of a language, not whether there are meanings shared between different languages, which is the subject of this dissertation.

Chapter 1: Translation and Formal Languages

"Translations can sometimes create a sense of *explanation*…."
(Goldblatt 1984:ix, italics in original).

§0. Introduction

The philosopher and linguist Jerrold Katz observed that the question of whether two languages are intertranslatable is fundamentally a question of their relative effability, that is, of the relative expressive power of the two languages (Katz 1972,1976,1978). Can $\mathcal{L}_1$ be used to say anything that can be said using $\mathcal{L}_2$? If not, there are some sentences of $\mathcal{L}_2$ that cannot be translated into $\mathcal{L}_1$.

Although this may seem at first glance like a highly intuitive notion, a closer look shows that is difficult to flesh out the details of what it means for two natural languages (NLs) to have, or not to have, equivalent expressive power. This is immediately evident in the fact that there is disagreement among scholars of language and translation as to whether all languages are equal in this respect or not. The disagreement seldom concerns the linguistic data, but rather how that data should be interpreted, and, at a more basic level, in what terms the question should be poised. Broadly speaking, the difficulties stem from three issues. First, the NLs under investigation, such as English, French or Kalaallisut, are not clearly demarcated entities. Even if this issue is put to the side for the moment (it will play a large role in later chapters), the only obvious method of assessing the relative expressive power of any two languages is via translation. If there is some $\mathcal{L}_1$ sentence σ whose meaning cannot be preserved under translation into $\mathcal{L}_2$, then $\mathcal{L}_1$ is more expressive, at least as regards the subject matter of σ; there may well be a sentence τ of $\mathcal{L}_2$ which cannot be translated into $\mathcal{L}_1$, so that $\mathcal{L}_2$ is in turn more expressive in some respects. Put otherwise, we are interested in the question of whether there is a total function

that can take us from sentences of $\mathcal{L}_1$ to sentences of $\mathcal{L}_2$ that have the same meanings. But there are no generally agreed upon criteria for what constitutes a successful mapping of sentences to sentences so that we can unequivocally say that both have the same meaning, even within the *same* language[5]. Of course, this is no small part because the definition of *meaning* is itself highly controversial. This issue is closely related to a third difficulty: there is general concurrence that any acceptable translation must preserve the relations of implication that occur between sentences, but putting this idea into practice is severely complicated by the fact that natural languages do not come equipped with formal procedures for evaluating this relation. There have been some attempts, notably by Katz (1972), to come to grips with this problem by working with precise definitions of natural language entailment, but careful reflection shows these efforts to be problematic (to be discussed in §3, and further in Chapter II)[6].

The artificial formal languages employed by logicians suffer from none of these defects. Since these are defined by stipulation, there is no question of what sentences a language contains, nor where one language ends and another begins, and there is not room for dispute about semantic properties or entailment relations. Further, the semantics of widely employed logics are defined extensionally, a move which sacrifices some of the connection with natural language reasoning but which makes the study of inference much more tractable.

[5] Note that this is a different worry than Quinean skepticism about the entire notion of synonymy. Because I am not a behaviorist and view meaning as ultimately grounded in the minds of language users, I operate on the assumption that there is a fact of the matter about when two sentences have the same meaning. However, there is still a methodological worry about how meaning should be defined, and how we can identify cases of equivalent meaning. These issues, as far as natural languages, will be dealt with more extensively in the next chapter.

[6] Katz is unique in that, of all the authors to discuss translatability, he was the only one to attempt precise definitions of either effability or translatability. Although his theories ultimately proved to be untenable, the fact they were clearly defined makes him a keystone figure in the field. Katz's views and his definitions will be discussed in detail in the next chapter. However, it should be noted that Katz's answers to three problems discussed here are based on his own theory of semantics (Katz 1972) and the Platonic nature of language (Katz 1981) which are not widely endorsed by other philosophers or linguists.

This last point deserves some discussion. The employment of extensional semantics allowed tremendous advances in the field of logic during the 20th century. This progress led many philosophers concerned with language to see the extensional approach as applicable to natural language, notably Quine, who saw it as an alternative to vague folk notions of meaning and intentionality, "creatures of darkness" as he called them (1956:180). In this tradition, continued by Lewis and Davidson and which perhaps reached its developmental apex in Montague semantics, there is a tight and clear link between results in formal logic and the study of natural languages semantics. Yet there are many reasons, some of which will be discussed in this chapter, for doubting the strength of this relation. As a starting point, we may have reservations about the treatment of coextensive predicates (e.g., *creatures with a heart* and *creatures with kidneys,* or *unicorns* and *round squares*) as meaning the same thing.

Modal logics and possible world semantics go some ways towards remedying the problems with the extensional approach, but even if predicates are defined by their extensions across possible worlds, problems remain. To illustrate using translation: we would, intuitively, reject *carré rond* as a literal translation of *objects not identical to themselves*, even though the extension of both predicates is the same in all possible worlds[7].

This short digression is merely to remind the reader that our purpose in this chapter is merely to (i) use formal languages to provide convenient, if overly simplified, illustrations of the natural language phenomena that we are concerned with, and to point out that (ii) even here, the situation is unexpectedly complex when looked at closely. It is not to be taken as an endorsement of an extensional view on natural language semantics. At the end we will discuss what lessons

[7] Katz made this point as well (Katz 1978). This is an interesting stance for an author who saw the subject matter of logic and linguistics as coextensive, and indicates that he had reservations about the way that both linguists and logicians typically understand their subject matter.

might be drawn from the present discussion, but unfortunately the relation between formal and natural languages is an oblique one.

Returning to the topic of the chapter, since the early 20th century, translation between formal languages has been an active area of investigation for logicians interested in assessing the relative inferential capabilities of various logics. As a result, there are several well-known total mappings between logics that are universally regarded as successful by any reasonable definition of translation, as well as cases where translation can be shown to be impossible. These considerations raise the hope that examining formal languages might serve to illuminate some of the obscurities of translation between NLs, somewhat on analogy with a physicist's use of mathematical models to explore the characteristics of physical systems. What we will actually find in this chapter is that the situation regarding formal languages is unexpectedly murky, with a number of different definitions of translation in use, and with intuition playing a much larger role than might be expected.

In §1 I will use formal languages to illustrate what it looks like for two languages to have, or not have, equivalent expressive power. This section will include some relatively nontechnical examples of formal languages that clearly are, or that fail to be, equivalent. The purpose of §1 is to provide precise illustrations that will be helpful in approaching NL translatability, and not to delve into logic for its own sake. Readers who do not have an independent interest in the translation of logics may wish to stop at the end of the section, skim §3 and then proceed to Chapter 2.

§2 will give a brief overview of some of the work in the translation of logics, from the 1920s until our times, and set out some of the various definitions of translation that have been offered. The discussion is meant to be a quick sketch rather than an exhaustive survey. This

section is provided more as a stand-alone, meant to complement rather than supplement the main discussion of the dissertation. However, we will see that at least one of the issues looming large here will reappear in the discussion of NLs, namely, that there are several, occasionally incompatible, definitions of translation on offer in the literature.

§3 will consider the similarities and differences between research programs investigating the translation of formal languages and those concerned with translation between natural languages. It will be seen that at least some of these programs should be regarded as different approaches to the same question, rather than as fundamentally divergent lines of research; however, it is questionable whether any of the results of line of inquiry will be directly applicable to the other. The chapter will close with a discussion of some of the key points raised in this chapter, and whether there are any lessons to be learned from them that might be applicable to NLs.

A quick note concerning vocabulary is in order. This chapter examines formal languages and logics, so it is important to specify how these terms are being used. Many of the authors discussed are interested primarily in the abstract mathematical study of logical systems, and so they define a *language* as a set of formulas, while a *logic* is an ordered pair formed from a language in this sense and a consequence operator or relation over that set (Carnielli and D'Ottaviano 1997, this is actually a special case of a more general definition, see §2). Another approach, drawn from the work of Kocurek (2018) is to define a *language* as an ordered triple consisting of a *syntax* that specifies a set of formula, a space of possible *structures*, and a semantic *satisfaction relation* defined from structures to formulas[8]. This gives a notion of

[8] Kocurek's definition is actually more general and speaks of evaluation points in logical space rather than structures. The definition used here is then a special case, which is the appropriate one for the sorts of languages discussed in this chapter.

semantic *entailment* by which if any structure that satisfies a set of formula Γ also satisfies some formula φ, then Γ entails φ, written $\Gamma \vDash \varphi$. A *logic* is the pairing of a syntax with a *consequence relation*, $\vdash$. Of particular interest are the cases in which a language "determines" a logic, that is, the language and the logic share the same syntax and $\Gamma \vdash \varphi \; iff \; \Gamma \vDash \varphi$ (the proof-theoretic consequence relation of the logic matches the satisfaction relation of the language, so that the logic is sound and complete, a situation that automatically obtains when the logic in question is well behaved in certain ways that Kocurek calls "Tarskian" (Kocurek 2018:6-9)). Because we are ultimately concerned with what formal languages might tell us about how natural language describe the world, it is these latter, primarily model theoretic, definitions of *language* and *logic* that will be assumed throughout this chapter. When a particular author is working with a different definition, this will be noted. Otherwise, a language $\mathcal{L}$ is understood as a triple as just defined, while a logic L is the ordered pair of the formulas of such a language with a consequence operator.

§1. Effability and formal Languages

The notion of the expressive power of a natural language, or what meanings it can express, known as *effability*, will be examined in more detail in the next chapter. What is important to understand for present purposes is that it is extremely difficult to establish when two NLs actually differ in expressive power, and there is often sharp disagreement concerning particular cases. As discussed in the previous section, this must be assessed by determining whether one language has the resources to translate any sentence of another. Determining whether this is the case is complicated by the fact that translators attempting to find an equivalent sentence in the target language for some sentence of the source language have recourse to a range of resources when no simple expression is ready at hand. They might paraphrase

recalcitrant sentences, take advantage of context or other pragmatic means to convey meaning, analyze away gaps in vocabulary, and as a last resort, introduce neologisms or import foreign words. This raises the issue of separating *communicability* from *translatability*, discussed in Chapter 0. It is difficult to draw a line separating those methods that are part of language use, properly speaking, and those which are in some respect extralinguistic and so out of bounds as far as determining expressive power; indeed, the pragmatic aspects seem hopelessly entangled with the semantic (this will be a major theme in following chapters, especially IV). Even if this issue where to receive a satisfactory resolution, it is seldom straightforward to assess whether the allowable methods can be successfully employed to express a given meaning. As a brief, tip-of-the-iceberg, example which involves closely related languages, let us return to a case mentioned in the last chapter. Consider that French has two second-person pronouns, the formal *vous* and informal *tu*, while English has only one. It is a matter of controversy whether a sentence containing either of these words can be exactly translated into English by using *you* and relying on context or additional phrases to convey the tone of address (see, for example, Katz 1976, Keenan 1978). This case, and many more, will be discussed in the following chapters, but the important point is that it is not a simple matter to establish that *any* two human languages have, or do not have, equivalent expressive power. If we want a simple, clear, and uncontroversial example, we must turn to considering formal languages.

In contrast to the situation with natural languages, we can identify numerous pairs of formal languages which are either clearly equivalent or not equivalent in this respect. To begin with, let us examine a case that will be familiar from an introductory logic course. Consider the language of classical propositional logic, $\mathcal{L}_{\wedge,\neg}$, whose syntax is defined using the two connectives $\neg$ and $\wedge$, and whose semantics are defined by the truth tables for these operators.

Consider another classical propositional language defined with a different set of connectives, for example $\mathcal{L}_{\vee,\neg}$. These languages are an obvious case of expressive equivalence, since the only difference between them is in the binary operator chosen as basic to the syntax, and the missing "vocabulary" can be introduced by definition. $\mathcal{L}_{\wedge,\neg}$ has the resources to introduce $\vee$ as a defined operator, and $\mathcal{L}_{\vee,\neg}$ might introduce $\wedge$ in the same way. This equivalence can also be demonstrated by translation: a total, in fact bijective, translating function $t: \mathcal{L}_{\wedge,\neg} \rightarrow \mathcal{L}_{\vee,\neg}$ can be defined such that for all $\varphi \in \mathcal{L}_{\wedge,\neg}$ and $\Gamma \subseteq \mathcal{L}_{\wedge,\neg}$, we have $\Gamma \vDash \varphi \; iff \; t(\Gamma) \vDash t(\varphi)$ where $t(\Gamma) = \{t(\psi) | \; \psi \in \Gamma\}$[9]. In §2 we will examine several definitions of translation, but all share this basic format of a total function from the formulas of one language into those of another that preserves some important relation (e.g., entailment, theoremhood, syntactic consequence) of interest given the author's purposes. As Kocurek points out, "if a translation preserves the meaning of a sentence, it ought to preserve its inferential role" (2018:51), a position that seems eminently reasonable for both formal and natural languages.

Of course, this same sort of translation function can be defined in other cases. A propositional language with a single operator, either the Sheffer Stroke ("not-and") or the NOR ("not-or") has a bijective mapping into $\mathcal{L}_{\wedge,\neg}$, and likewise for a language with arbitrarily many truth-functional operators. Such mappings are often laborious procedures to put into practice; for instance, the $\mathcal{L}_{\wedge,\neg}$ formula $p \rightarrow \mathrm{q}$ becomes, in the language using only the NOR operator $\downarrow$, the much longer $\Big(\big((p \downarrow p) \downarrow q\big) \downarrow \big((p \downarrow p) \downarrow q\big)\Big)$. Yet the differences in how concisely two languages can express equivalent formulas is irrelevant to the question of whether a translation exists between them. This illustrates the point that, at least at this level of formal languages with

[9] Throughout this chapter, anytime that $t(\Gamma)$ is used, let it be defined the same way, in order avoid to ungainly repetition.

their relatively simple semantics, different sets of symbols can be used to express exactly the same statements.

These classical propositional languages, and the logics determined by them, are paradigm examples of *notational variants*. This means, in very loose informal terms, that two languages are using different sets of symbols, yet they express semantically equivalent sentences. This notion has a clear analog with the idea of two natural languages being fully intertranslatable in the sense they are using different strings of sound or sign to encode the same set of meanings. Yet, as with the translation of NLs, and despite the importance of the notion in the work of logicians investigating mappings between logics, *notional variant* is an undefined, intuitive concept, and there is disagreement concerning how to provide a more rigorous definition (Kocurek 2017, to be discussed further in the next section).

Despite this vagueness, there are certainly pairs of languages which *cannot* be considered notational variants, or even intertranslatable, under any reasonable definition of these terms. If we do away with negation in classical propositional logic, to define a language $\mathcal{L}_{\wedge}$, we might still stipulate a total translation function t: $\mathcal{L}_{\wedge} \longrightarrow \mathcal{L}_{\wedge,\neg}$ which will preserve entailment, as in the case, discussed above, of $\mathcal{L}_{\wedge,\neg}$ and $\mathcal{L}_{\vee,\neg}$. However, in this case the translating function in the other direction, s: $\mathcal{L}_{\wedge,\neg} \longrightarrow \mathcal{L}_{\wedge}$ cannot be a *total* function if it is to meet the criteria that $\Gamma \vDash \varphi \; iff \; s(\Gamma) \vDash s(\varphi)$; this should be immediately evident from the observation that $\mathcal{L}_{\wedge}$ contains no tautologies and so s cannot be defined in such a way as to preserve entailment in the cases where $\Gamma = \emptyset$, among others. Therefore, we see that $\mathcal{L}_{\wedge}$ is a notational variant only of a proper fragment of $\mathcal{L}_{\wedge,\neg}$ (the negation free fragment). Similarly, if we restrict attention to a propositional logic with only a finite set of sentence letters, we find that such a language contains only a finite set of nonequivalent sentences, 2^{2^n} for a language with n sentence letters. Since

$\mathcal{L}_{\wedge,\neg}$ contains all of these and an infinity of others, we find that the finite language is also equivalent only to a fragment of $\mathcal{L}_{\wedge,\neg}$. Along the same lines, monadic first-order logic, FOL, although infinite, is a fragment of full polyadic FOL.

So far, we have discussed examples where languages are straightforwardly comparable, since they are simply cases of differing sets of logical symbols being used to describe the same sorts of structures, with the same notion of satisfaction. If we take the position that languages are fundamentally maps from sentences to the structures that they describe (a view suggested by Kocurek (2018)) then there is a clear sense in which a language such as $\mathcal{L}_{\wedge,\neg}$ is more expressive than $\mathcal{L}_{\wedge}$, since it can "say more" about a given class of structures in that it has formulas satisfiable by a wider range of those structures. Things become more complex when we vary either the class of structures (e.g., first-order and propositional languages) or the satisfaction relation (e.g., intuitionist to classical logics) between the two languages.

There are certainly clear cases in which one language describes more complex, finely detailed structures than another, and so is more expressive than one that provides less detail. In this case, we can use translations that preserves the semantic structure of a language in order to make a comparison. If we find that the translation in either direction fails to be total, then one of the two languages is carving up logical space in finer detail[10]. For example, we find that we cannot define a total translating function from FOL into $\mathcal{L}_{\wedge,\neg}$ that preserves entailment. Since

[10] Or possibly the two are simply incommensurable in some way. For instance, published works on logical translation are generally restricted to monotonic logics (Carnielli and D'Ottaviano 1997) or to "Tarskian Logics" whose consequence relation is monotone, contractive, commutative, and reflexive (Kocurek 2018). Although many authors suggest that some future expanded account of translation might cover logics outside of these boundaries, no systematic way yet exists of comparing the inferential powers of these logics to more conventional ones (although see Makinson 2005 for an informal comparison of the classical and nonmonotonic consequence relation). This raises intriguing questions concerning the possibility of encountering an alien natural language whose underlying logic was simply too different to allow successful translation into human languages (see, e.g., Frege 1993, Conent 1991). Unfortunately, space will preclude discussing this scenario in this dissertation.

both quantified and quantifier free sentences must be translated into propositional variables, we find, for instance, that no function t can be defined such that $t(\forall x \varphi x) \vDash t(\varphi a)$. Therefore, it seems that the structures which can be described by FOL are more information rich in some intuitive sense than those which can be described by propositional logic (although the situation is unexpectedly complicated, as will be discussed in the next section. Note that the claim here is that such a function cannot be readily *defined* for actual use, not that it does not exist).

A different example of asymmetry in the expressive power of languages, measure by their ability to describe structures, obtains between propositional modal logic and FOL. Let $\mathcal{L}_{\Diamond,\Box}$ be the language defined by supplementing $\mathcal{L}_{\wedge,\neg}$ with the modal operators $\Box$ and $\Diamond$. The result of expanding the propositional language in this way is a very different language which must be defined over a new class of structures. In fact, $\mathcal{L}_{\Diamond,\Box}$ can be seen as a fragment of FOL, since $\Box$ and $\Diamond$ are quantifiers over possible worlds (or states of a computer program, moments in time, intentional states of belief and knowledge, or whatever else happens to be in the domain under consideration).

A way of making the equivalence between $\mathcal{L}_{\Diamond,\Box}$ and a portion of FOL clear is to employ a translating function. In the case of these two languages, we have available the widely studied *standard translation*, which maps sentences of the modal language into FOL. Semantic properties, including entailment, are preserved under the mapping (call it st), since a modal frame that satisfies a sentence $\varphi \in \mathcal{L}_{\Diamond,\Box}$ maps point by point into a first-order structure that would satisfy the sentence $st(\varphi) \in FOL$. The $\Box$ and/or $\Diamond$ operators occurring in φ are replaced by, respectively, universal and existential quantifiers, and the accessibility relation between nodes of the modal frame (e.g., possible worlds, moments, states) described by φ becomes a

dyadic predicate (the standard translation will be spelled out in full in §2). This allows a mapping between the nodes of the modal frame into elements of the first- order domain, and the extension of the dyadic predicate used in $st(\varphi)$ is defined over these elements so as to correspond to the accessibility relation specified by φ.

But, although st is injective it is not surjective, nor does any total translating function exist in the other direction. We know this because it can be easily demonstrated there are FOL formula with no counterpart in $\mathcal{L}_{\Diamond,\Box}$, for instance, Rxx, i.e., no modal formula can specify that a node (state or world) is accessible from itself[11]. We thus observe that a total mapping exists from $\mathcal{L}_{\Diamond,\Box}$ into FOL but not from FOL to $\mathcal{L}_{\Diamond,\Box}$, and therefore that the modal language is equivalent to a proper fragment of FOL (known as the *bisimulation invariant fragment*, see Blackburn et al. 2001).

When we turn to natural languages, of course we might strongly suspect that there are few or no cases where one language can be said to describe its intended structure (the world) in more detail, *tout court*, than some other, let alone to have another natural language as a proper fragment[12]. But there are certainly cases where one language makes much finer distinctions in some area or the other. For instance, languages differ widely in the amount of color vocabulary (Levinson 2016, Berlin and Kay 1969) or mathematical nomenclature (Hammerström 2010) that they have available. If languages are truly equal in their expressive power, and so fully intertranslatable, as claimed by Katz (1972,1976,1978) and Jakobson (1959), among others, then there must be some way to obtain total mappings between pairs of languages even when their

[11] Although the demonstration is a relatively simple reductio proof, to give it here would require preliminaries that would take us too far into the discussion of modal semantics. The interested reader can refer to page 88 of Blackburn et al. 2001.

[12] Aside from a few special cases, e.g., indigenous Australian "mother-in-law languages" (Dixon 1980).

vocabularies differ along these lines; otherwise, of course, translatability would fail to some degree. Languages have also been identified which cannot make all of the modal distinctions available in English (Deal 2011), or, more controversially, specific languages have been claimed to lack universal quantifiers (Everett 2005) or any sort of binary Boolean operator (Gil 1991). Since we have seen that, at least as a practical matter, FOL cannot be translated into a propositional language, we might be, at least intuitively, dubious that English can be fully translated into a quantifier-less NL. We will examine these issues in much more detail in later chapters.

Before moving on to definitions, Tarski's Indefinability Theorem (Tarski 1944) should be briefly mentioned. This famous result is pertinent to the present discussion in two respects. First, it suggests limits on effability, not for any particular formal language, but for all formal languages, and possibly for all languages of any sort. Second, it suggests that a strict ordering of expressivity is possible, in that for every language there is a metalanguage which is more expressive in a measurable way.

Tarski's well-known theorem will not be discussed here in technical detail, but, in brief, he showed that no first-order language capable of expressing basic arithmetic can express its own truth predicate. If the contrary is assumed, a formal analog of a *liar sentence* ("This sentence is true if and only if it is false") can always be derived via numerical coding, demonstrating the semantics of the language to be incoherent. This suggests a constraint on the expressive power of any formal language: either the language cannot capture basic arithmetic, or it cannot express its own truth predicate. In other words, no moderately strong language can contain a predicate whose extension includes all sentences true in that language. This dissertation is not the place to consider whether this result holds for natural languages, as this requires an extensive discussion

of *truth*. However, Tarski's theorem does provide a clear model of what it is for a certain predicate to be absolutely inexpressible in a given language.

A second point of interest lies in Tarski's proposed solution (Tarski 1944). Although no language $\mathcal{L}$ expressive enough to capture basic arithmetic can also capture its own truth predicates, a metalanguage $\mathcal{L}_m$ which is powerful enough to form statements about the sentences of $\mathcal{L}$ can express the truth predicate of $\mathcal{L}$. This results in a hierarchy of languages, with the language at each level n of the hierarchy capable of expressing something not expressible by the language at level $n-1$, namely that any given sentence of $\mathcal{L}_{n-1}$ is true. Again, this provides us with a particularly clear model, this time of what it looks like for one language to have more expressive power in some well-defined aspect than another. It is worth pointing out the import of "in some…aspect". Although in the simplest case, $\mathcal{L} \subset \mathcal{L}_m$, this is not necessary, and it might be that $\mathcal{L}_m$ contains the truth predicate of $\mathcal{L}$ while $\mathcal{L}$ is more expressive in some other way. For example, $\mathcal{L}$ may contain more predicates than its metalanguage. This suggests that more than one ordering might be generated, depending on the criteria used.

§2 Definitions of Translation, Examples, and the Search for Notational Equivalence

Having surveyed some facile examples of relative expressive power and translation involving formal languages, we should now examine some of the ways in which this notion has been defined. For the most part, the focus of research has been on logics rather than on the languages themselves, Kocurek (2018) being a noteworthy exception. The study of translations between logics has been a common technique for "measuring the inferential capabilities of a logic" (Kocurek 2017:1). It was for this purpose that translations were first studied by logicians, in the 1920s, the specific case of interest at that time being the relation between classical and

intuitionist logic (Carnielli and D'Ottaviano 1997). Since then, a number of translations between widely used and well-studied logics have been proposed.

The basic idea is simple: a translation is a "map between formulas that faithfully preserves consequence" (Kocurek 2017:1). If we are more concerned with formal languages and their semantics, definitions of translation expressed in terms of logics and their consequence relations will be useful as long as we restrict attention to complete logics where the entailment relation of the language is equivalent to the relation of proof theoretic consequence, and outside of these some adjustments may be necessary. In any case, various definitions have been proposed to make this notion more precise, which are more, or less, permissive, and of course different pairs of logics are intertranslatable under different definitions. The notion of *notational variant*, mentioned in §1, is often held to be an important concept in research on logical translations. It is widely opined (e.g., Wojccicki 1988, Epstein 1990) that in order for two logics to be considered notational variants, it is sufficient that that a consequence-preserving mapping exist in both directions, each defined in such a way that translating a formula from one logic to another and then back gives a formula logically equivalent, in semantic terms, to the original (the condition which Kocurek (2017) calls *translational equivalence,* to be described more precisely below). For instance, the logics determined by the languages $\mathcal{L}_{\wedge,\neg}$ and $\mathcal{L}_{\vee,\neg}$ are clear cases of notational variants, and $\mathcal{L}_{\Diamond\Box}$ is widely regarded as a notational variant of the bisimulation invariant fragment of FOL, though not of full FOL.

However, this notion of notional variant has been challenged as too permissive, since it would include highly gerrymandered translation functions (Kocurek 2017,2018). If one is willing to allow for contorted enough of a mapping, some pairs of logics will be counted as notational variants which are intuitively not anything of the sort (e.g., FOL and $\mathcal{L}_{\wedge,\neg}$). Some representative

cases will be discussed below, as well as some suggestions that have been made for more restrictive criteria.

Before proceeding, we should examine some of the different ways in which translation between logics has been defined. The following are some noteworthy definitions proposed in the literature[13].

Prawitz and Malmnäs (1968): Although earlier papers had discussed translations between logics, this was the first to provide an explicit definition. The basic definition is given in terms of theorems, such that a *translation* from L_1 to L_2 is a function t: $L_1 \longrightarrow L_2$ such that for all $\varphi \in L_1$, we have $\vdash_1 \varphi \; iff \; \vdash_2 t(\varphi)$. If a translating function exists from L_1 to L_2, then L_1 is called *interpretable* in L_2. If the consequence relation, more generally applied, is preserved under translation, such that for all $\varphi \in L_1$ and all $\Gamma \subseteq L_1$, we have $\Gamma \vdash_1 \varphi \; iff \; t(\Gamma) \vdash_2 t(\varphi)$, then L_1 is *interpretable in* L_2 *with respect to derivability*.

Worth noting here is that the preservation of theorems under translation is regarded as a minimal condition for translation, an idea that is still present in more recent literature. This interest in theorems seems to have been retained from the earliest works on translating between logics, by Kolmogoroff (1925), Gödel (1933) and Gentzen(1925), and is perhaps a reflection of the view, prevalent in the early 20th century, of logic as being concerned with the identification of theorems. As stated in one survey on logical translation: "What is interesting to remark is that in all these historical papers and in other more recent uses of translations the emphasis on the preservation of theoremhood has been maintained" (Carniellis and D'Ottaviano 1997:69).

[13] Throughout, notation has been modified from the original papers in order to keep things uniform over the entire chapter. To clarify my usage, the single turnstile, ⊢ is the syntactic, or proof theoretic, consequence relation of a logic, the double turnstile, ⊨, is the semantic, or model theoretic, entailment relation of a formal language.

Epstein and Krajewski (1990): This work represented the first systematic treatment of translations between logics; however, the scope was limited to sound and complete propositional logics. Here, translation was defined by the semantics of the languages. A *validity mapping* between L_1 and L_2, is a function t: $L_1 \longrightarrow L_2$ that preserves tautologies, that is, for all $\varphi \in L_1$, $\vDash_1 \varphi \; iff \; \vDash_2 t(\varphi)$. A *translation* is a function that preserves entailment, such that for all $\varphi \in L_1$ and all $\Gamma \subseteq L_1$, $\Gamma \vDash_1 \varphi \; iff \; t(\Gamma) \vDash_2 t(\varphi)$. Because the logics under consideration are assumed to be complete, these definitions are, of course, equivalent to those of Prawitz and Malmnäs as far as their intended applications.

Carnielli and D'Ottaviano (1997): This "manifesto" of a long-term Brazilian research project into translations gave a set of definitions intended to be more general than those given above. A *translation* between L_1 and L_2 is a function t: $L_1 \longrightarrow L_2$ such that for all $\varphi \in L_1$ and $\Gamma \subseteq L_1$, we have $\Gamma \vdash_1 \varphi \; only \; if \; t(\Gamma) \vdash_2 t(\varphi)$.[14] Note the difference between this and the previous definitions is that the relation between consequence in the source logic and the target logic is one way, rather than biconditional; a definition using a biconditional, identical to *interpretability with respect to derivability* in Prawitz and Malmnäs, is called a *conservative translation*. This reflects a stance on the authors' part that some mappings that are "obvious examples of translations" are unduly excluded from consideration by restricting attention to what they call conservative translations (Carnielli and D'Ottaviano 1997: 72). Among these "obvious examples" is a

[14] Actually, this is only a specific case of the Carnielli and D'Ottaviano definition. In that work, a logic is defined as a pair $\langle A, C_A \rangle$ where A is a set, not necessarily of formulae the *universe* of the logic), and C_A is a closure operator in A. As the authors put it, "In order to stress what seems to be the essential feature of a logical translation and obtain the most general properties of such translations, we will ignore the fact that in general a logic deals with formulae of a language…" (Carnielli and D'Ottaviano 1997:70). Thus, translation is defined in terms of the closure operator in the universe of the logic, although it is noted that "in the particular case in which $\vdash_A$ and $\vdash_B$ are syntactic consequence relations in the calculi A and B, respectively" this definition is equivalent to the one given above in the main text (Carnielli and D'Ottaviano 1997:72). While it is clearly this specific case that we are concerned with here, this very broad notion of the scope of logic seems too interesting not to mention.

function from intuitionistic into classical logic, something that is ruled out by most other definitions of translation.

Kocurek (2017): In this article, Kocurek defines ***translation***[15] in a way that is identical to what Carnielli and D'Ottaviano call a *conservative translation* and Prawitz and Malmnäs call *interpretability with respect to derivability* (in Kocurek 2018, what Carnielli and D'Ottaviano's call a simple *translation* is termed a *quasitranslation*). Kocurek also provides a hierarchy of successively more restrictive criteria of translation, a move similar to that which Katz makes when defining translation for natural languages (discussed in the next chapter, §3). L_1 and L_2 are ***intertranslatable*** when there exists a translating function in both directions. ***Translational equivalence*** obtains when L_1 and L_2 are intertranslatable by the translating functions $t: L_1 \longrightarrow L_2$ and $s: L_2 \longrightarrow L_1$, and in addition for all $\varphi \in L_1$ we have $s\big(t(\varphi)\big) \vdash_1 \varphi$ and $\varphi \vdash_1 s\big(t(\varphi)\big)$, and similarly for all $\psi \in L_2$, $t\big(s(\psi)\big) \vdash_2 \psi$ and $\psi \vdash_2 t\big(s(\psi)\big)$ (i.e., the result of translating a formula into the other logic and then back gives a formula that is equivalent, in terms of derivability, to the original). If the function between L_1 and L_2 is bijective, then the two logics are said to be ***isomorphic***. The further notions of *compositionality* and *schematicity*, which add additional criteria on how these translating functions can be defined, will be discussed below.

As mentioned previously, the first published work on translations between logics concerned the relation between intuitionistic and classical logic. Glivenko (1929) showed that if φ is a theorem of the logic determined by $\mathcal{L}_{\wedge,\neg}$ then $\neg\neg\varphi$ is a theorem of intuitionist propositional logic[16]. Of course, this implies that a function t could be defined from classical

[15] Certain of Kocurek's definitions for various levels of translatability are referred to so frequently in what follows that they are bolded here, in case the reader needs to find them again.

[16] This result had already been proven by Kolmogoroff (1925), who also suggested but did not prove that it would also be applicable with first-order languages. However, his work seems to have been unknown to Glivenko, and it

into intuitionist formulas such that $t(\varphi) = \neg\neg\varphi$, where t would be a *translation* in the terms of Prawitz and Malmnäs. Much later (Feitosa 1997), it was established that the double negation mapping in fact preserved consequence more generally, making t also a *translation* in the terminology of Kocurek, and a *conservative translation* for Carnielli and D'Ottaviano. The double negation translation from classical to intuitionistic logic is among the best studied and widely accepted examples of formal translation, but it is generally not seen as a case of notational variance because the translation only runs in one direction[17].

Another, slightly more complex, but also widespread and uncontroversial example is the *standard translation* from modal logic to FOL, which was discussed, informally, in the previous section. One way of defining the standard translation is as follows, after Kocurek (2017:3)[18]. Let FOL be defined over a first-order language which uses a countably infinite stock of variables x_1, x_2 ..., a countable number of predicates $P_1^n, p_2^n \ldots$ of arity n for each $n \in \mathbb{N}$, the universal quantifier ∀ and the connectives ¬,∧, with the conditional ⊃ added as a defined connective. Let

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was the latter's ideas that were developed by Gödel in his publications on the topic (Carnielli and D'Ottaviano 1997). It is notable that Gödel's own translation function preserved theorems by not consequence more generally, and so would not be a translation in the sense of Kocurek or Carnielli and D'Ottaviano (Feitosa and D'Ottaviano 2001).

[17] By Carnielli and D'Ottaviano's definition of translation, the identity mapping of intuitionist logic into classical constitutes a translation (1997:72), but this function is not a translation by most other definitions, and it would be termed a *quasitranslation* by Kocurek (2018). This is because, where $\vdash_K$ is the syntactic consequence operator of classical propositional logic and $\vdash_I$ its intuitionist counterpart, we have $\Gamma \vdash_I \varphi \Longrightarrow t(\Gamma) \vdash_K t(\varphi)$, but $t(\Gamma) \vdash_K t(\varphi) \nRightarrow \Gamma \vdash_I \varphi$ (e.g., since the translation is an identity mapping, $t(p \vee \neg p) = p \vee \neg p$, and $\emptyset \vdash_K p \vee \neg p$ but $\emptyset \nvdash_I p \vee \neg p$). Kocurek (2017:8) does, however, prove that a full translation (as he defines translation, in the biconditional sense) does exist from intuitionist into classical propositional logic, although the actual function is not defined (the proof is not constructive). However, he considers this result to be unproblematic, because it also shown that these two logics cannot meet the more restrictive criteria of *translational equivalence* (see definition in main text) that is widely taken (by e.g., e.g., Wojccicki and Epstein) to be both necessary and sufficient for two logics to be considered notational variants (2017:5; Kocurek himself takes this condition to be necessary but not sufficient).

[18] See also Blackburn, Rijinke and Venema, where the reader is warned "against viewing modal logic as an isolated formal system" precisely due to the existence of such translations (2001:83). Between various sources, there are differences due to different authors using different notational variants of FOL and the basic modal language. For instance, Kocurek defines FOL using ¬,∧ and ∀ while Blackburn et al. employ ¬,∨ and ∃. This results in differences in the presentation of clauses of the translation that are, of course, merely cosmetic.

K be the minimal normal modal logic determined by a language $\mathcal{L}_{\Box}$ which has an infinite stock of sentence letters p_1, p_2 .... and has as its logical vocabulary the modal operator $\Box$ and the connectives $\neg$,$\wedge$.

Let R be an arbitrary predicate in the first-order language, of arity two, and n a natural number. Then a translating function $ST_n: K \longrightarrow FOL$ can be defined as follows to map the formulas of $\mathcal{L}_{\Box}$ into first-order formulas in such a way as to preserve consequence.

$$ST_n(p_i) = P_i^1(x_n)$$

$$ST_n(\neg\varphi) = \neg ST_n(\varphi)$$

$$ST_n(\varphi \wedge \psi) = \big(ST_n(\varphi) \wedge ST_n(\psi)\big)$$

$$ST_n(\Box\, \varphi) = \forall x_{n+1}\big(R(x_n, x_{n+1}) \supset ST_{n+1}(\varphi)\big)$$

In this definition, the binary predicate R represents the accessibility relation between the nodes of the frames described by the formula of $\mathcal{L}_{\Box}$. The variables and quantifiers of the translated formulas range over these same nodes, now viewed as the elements of a first-order structure. The subscript n on ST_n refers to a particular variable, x_n, used in the translation, while the shift to x_{n+1} signals the use of a new variable.

The standard translation is well studied and universally accepted. It shows K to be *interpretable in FOL with respect to derivation*, in the terms of Prawitz and Malmnäs, is a *translation* in Kocurek's nomenclature and a *conservative translation* in Carnielli and D'Ottaviano's (obviously the definition of Epstein and Krajewski is not applicable). In fact, it is often stated (sometimes in slightly different vocabulary) that the existence of this mapping shows K to be a notational variant of a fragment of FOL (Kracht and Wolter 1999; Blackburn et

al. 2001; Kocurek 2017,2018). While this is itself relatively uncontroversial, it is actually surprisingly complicated to define *notational variant* in such a way as to include the standard translation but to at the same time exclude undesirable cases.

As noted above, it is widely held that Kocurek's definition of *translational equivalent* or some equivalent notion is sufficient for two logics to be considered notational variants, or at least for one logic to be a notational variant of a fragment of another. While this definition frequently gives what are intuitively correct results, for example in the case of the standard translation, it also allows in problem cases. A seminal (and perhaps unsettling) result in this area, due to Jerabek (2012), is that any compact monotonic logic with at most countably many formulas is *translatable* (in Kocurek's sense) into the classical propositional logic, the logic determined by $\mathcal{L}_{\wedge,\neg}$[19]. As a result, "Isomorphism to [classical propositional logic] is difficult to escape for classical languages"[20] (Kocurek 2018:81), and Jerabek's proof served as a basis for further surprising results. For example, Kocurek demonstrated that FOL and classical propositional logic are not only *translationally equivalent* but *isomorphic* (the most restrictive of Kocurek's classifications), and therefore qualify as notational variants of one another by the most commonly used criteria[21]. Clearly, this is a highly counterintuitive result, as FOL is based on a much more expressive language by any reasonable measure. This strongly suggests that neither

[19] As Kocurek puts it, with a degree of understatement, "the details of the proof are quite involved" (2017:7). The interested reader is referred to the original.

[20] While this is a dramatic way of putting things, it does not hold for all classical logics. In particular, many cases are ruled out by the fact that only compact logics can be translated into compact logics (Kocurek 2017). So, for example, we may rule out a translation from second order logic into either propositional or first-order logic. Note also the statement tells us nothing about non-classical logics, for instance Kocurek shows that classical and intuitionist propositional logic are not *translationally equivalent*, let alone *isomorphic* (Kocurek 2018:65, see also fn 13).

[21] The proof is algebraic and proceeds by reducing the logics to their Lindenbaum-Tarski algebras. It is given in Kocurek 2017 (7-8) and in more detail in Kocurek 2018 (78-80). Although the proof shows that a bijective translation must exist between the two logics, it is also established that it is an *undecidable* mapping (see next footnote).

translational equivalence nor *isomorphism* is a sufficiently restrictive criterion for two logics to be considered notational variants of one another.

One option for ruling out such a case might be to appeal to the fact that any translating function from FOL into propositional logic would necessarily be undecidable[22] (Kocurerk 2017,2018). However, requiring that notational variants be translationally equivalent, with a decidable translating function, is still insufficiently restrictive, as it would still allow the translation of monadic FOL into propositional logic. Another direction to look might be *compositionality*, which is simply the intuitive notion that "one defines the translation of a complex formula as some fixed schema of the translation of the parts", a property shared by most translations studied in the literature (Kocurek 2018:89; a much more precise definition is also given, but it is lengthy and not needed here). It can be demonstrated that, as desired, there is no compositional translation from FOL into propositional logic (Kocurek 2017,2018).

At the same time, however, the requirement of compositionality is too strong in some respects, since it would rule out the standard translation, one of the most widely accepted cases of notational variance (Kocurek 2017:11). In particular, the final clauses of the definition, $ST_n(\Box\,\varphi) = \forall x_{n+1}\big(R(x_n, x_{n+1}) \longrightarrow ST_{n+1}(\varphi)\big)$ is not compositional. Compositional translations must contain, as subformulas, the translations of their constituent formulas, and so $ST_n(\varphi)$ would be required to appear as a subformula of $ST_n(\Box\,\varphi)$, but it does not. Instead $ST_{n+1}(\varphi)$ appears. Thus, the standard translation is not compositional, and Kocurek (2017)

[22] *Undecidable* is used here in the sense that a *decidable* translating function is one such that the consequence relation of the source logic is Turing-reducible to that of the target logic, i.e., $t\colon L_1 \longrightarrow L_2$ is such that $\vdash_1$ is Turing-reducible to $\vdash_2$. Making this a requirement for a certain level of translatability would rule out any such function from an undecidable to a decidable language. Kocurek discusses, in addition to the objections mentioned above, cases where this criterion would be too restrictive, leaving out some pairs of logics that are clearly only trivial variants of one another despite one of the pair being undecidable (Kocurek 2018:84).

shows that in fact there is no compositional translation from modal logic into FOL. Based on this result, it would be undesirable to use simple compositionality as a criterion.[23]

A refinement of compositionality which gives the desired results is *schematicity*. Informally, this notion is slightly weaker than compositionality, as it only requires that "the translation of a complex formula is uniform and fixed solely by its syntactic structure" (Kocurek 2017:12, as with compositionality a more precise definition is available, but it is lengthy and not needed here). Notice that the standard translation is schematic in this sense, since the translation of $ST_n(\Box\ \varphi)$ meets the requirement of "uniformity" and is "fixed by its syntactic structure". If notational variance is defined by the existence of a schematic translation equivalence between two logics, we find that modal logic and the guarded fragment of FOL are in, while FOL and classical propositional logic are out (as is a translation from intuitionist into classical logic), and so it seems as if this may be the best definition to give to the intuitive idea of *notational variable*. However, Kocurek cautions that at the end of the day this is an informal concept, and while this definition may line up well with intuition, there may be no "unique precisification" (2017:13). Instead, what it means for two languages to be notational variants on one another may depend on the interests and purposes of the researchers exploring their relation; this is a point that is highly applicable to natural language translatability as well, as we will see in upcoming chapters.

§3 Similarities, Differences and Lessons Learned

At this juncture, we will conclude our brief tour of the formal realm and turn to natural languages. Before shifting focus, we should ask: what lessons can we carry forward with us?

[23] However, it is frequently used as such. Kracht and Wolter (1999), Pelletier and Urquhart (2003) and Caleiro and Goncalves (2007) have compositionality as a requirement not only for notational equivalence, but for translation.

A first matter that we may wish to reflect on is the relation between two projects: work on the relative expressive powers of natural languages, of the sort to be examined in the next three chapters, and work on the relative expressive powers of formal languages, as discussed in this chapter. In many cases, there quite simply is no obvious relation. At least in some measure this is because one factor facilitating the study of translations between formal languages is that their semantics are, as discussed in §0, defined *extensionally*, which creates easily identified semantic equivalencies between classes of formulas. Note, for instance, that the definition of *translationally equivalent* requires only that a formula φ can be translated from source language (SL) to target language (TL) and then back again to arrive at some SL formula that can be derived from φ, and from which φ is also derivable. Because the logic is assumed to be sound the result will also be semantically equivalent, which is close enough for the logician's purposes. The semantics of natural languages are generally understood to be more complex. Intuitively, for two languages to be considered translatable into one another, we would want to be able to translate any given sentence S of one language into the other and then back to arrive once again at S, the original sentence itself, or at least a very close approximation, and not merely something that was truth conditionally equivalent. If this is hard to see at first, consider that we would roundly reject the work of a translator that mapped every tautology occurring in the SL text to a random tautology in the TL, e.g., "This is either a dissertation, or not a dissertation" to "Si Albert est un chat, il est un chat".[24]

[24] That is, at least if we are concerned with preserving the *literal* meaning (as it is intuitively understood) of the sentences that we are translating. In general, this dissertation is concerned only with translation in this rather narrow sense, because this has been the traditional focus in translatability, with the use of non-literal meaning falling under the rubric of communicability. As mentioned in Chapter 0, one might find this focus objectionable, and it is certainly sometimes difficult to maintain a principled distinction between literal and non-literal meaning. Ultimately, this might be seen as a different route for motivating the conclusions ultimately drawn in Chapter IV, but for reasons of space I will not explore this line. It should be noted that in other discussions of translation, such as questions about how literature should be translated, we might be more concerned with aesthetic effects or the

Another factor limiting interchange of results between the two programs is that the dominant approach to logical translation (best represented by Carnielli, D'Ottaviano, Feitosa and others in what might be called the "Brazilian School") is entirely algebraic, with no interest in interpretations for the languages studied. As such, this body of research- fascinating as it is- is an exercise in pure mathematics; this can be clearly seen in the fact that a standard definition used for a *logic* in this tradition dispenses with any mention of languages or formulas (Carnielli and D'Ottaviano 1997:70, see fn 9 for discussion).

However, there is another strain of work in this area. This, much more recent, line of research is best represented by Kocurek, who begins his dissertation by asking "There are many different ways one can describe the world…. what makes one language better than another?" (2018:v). Kocurek makes it clear in the introduction to the work that by *language* he means any way of describing the space of possibilities ("logical space"), a notion he attributes to early Wittgenstein (2018:vi) and which includes both natural and formal languages. Although he notes that his work differs from most proceeding work in the area because his focus is on (formal) *languages* rather than on *logics*[25], he goes on to demonstrate that results on translations between logics are applicable to the study of formal languages and vice-versa, allowing a perhaps surprising degree of continuity between his program, which is more philosophically oriented, and that of the Brazilian School (2018:ix).

Despite the wide scope of his aims, Kocurek's work is highly mathematical and deals exclusively with formal languages. There is some investigation of specialized fragments of natural languages, but this is conducted by formalization. An example is the regimentation of

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overall message of the author, which may justify, for instance, substituting one tautology for another. See Hofstadter (1997), Steiner (1975) or Robinson (2008) for a discussion of cases in which a translator may wish to sacrifice literal meaning in order to preserve some other property of the SL text.

[25] If a refresher is needed at this point on how these terms are being used, refer to the last paragraph of §0.

"languages" associated with different metaphysical theories. In this discussion, *languages* is used in a sense reminiscent of Kuhn (1962). Thus, adherents of two different metaphysical theories may be, at least overtly, speaking the same natural language, e.g., English, yet might have basic ontologies that are so different that they are in effect speaking different languages. This might hinder any attempt to actually compare the two theories, but progress can be made through regimentation and translation. The two sides begin with a common formal language, and each adds the axioms needed to capture their respective theories. Translation, or the impossibility of translation, between the resulting systems can then be studied systematically to pinpoint where theories actually disagree in an intelligible sense, where they are totally incommensurable, and where the apparent disagreement was really just a question of nomenclature to begin with (Kocurek 2018, especially 163-192). This aspect of Kocurek's work represents a point of intersection between the study of logics in the abstract and the study of natural languages. Still, the actual application to NLs is limited to small, highly specialized, fragments used in the expression of philosophical theories and that can be readily formalized.

It seems clear that Kocurek, given his very broad definition of language, intends his work to be continuous with, and perhaps to provide some insight on, the translatability of NLs, which is of course the primary concern of this dissertation. It is intriguing to speculate that Kocurek's investigations, which make extensive use of results in the mathematical study of translation between logics regarded as abstract algebras, could represent a point of connection between that body of work and the study of natural language translatability. Still, it is difficult to see how this connection could actually be made. One of the main themes of the present work is that the application of formal methods to natural language semantics, such as reducing the meaning of sentences to their truth conditions, is in many respects not an appropriate approach to

the analysis of NL translation. Perhaps there is an approach to the study of natural language translatability that could fruitfully combine with the work of the algebraists studying the translation of logics, but the way to proceed is not obvious, and in any case this would represent a substantial project, well outside the scope of this dissertation.

A second question to consider is whether any of the definitions of *translation* that we have looked at in §2 might be applicable, with suitable modifications, to NLs. Clearly, no definition given entirely in terms of theorems or syntactic consequence relations will be applicable, since these have no clearly defined counterparts among NLs.

What about the preservation of semantic entailments? We can see immediately that, although this was sometimes proposed as a *sufficient* condition for translation of formula between two formal languages (e.g., by Epstein and Krajewski), this can hardly be restrictive enough, by itself, for natural languages, since it would allow the translation of any SL tautology by any TL tautology, an undesirable result for NL translations.

Initially, it seems more promising to suggest that semantic entailments should be a *necessary* condition on translation. If a translator claimed to have rendered "Albert is a black cat" into a foreign language but in such a way that the translation did not entail the TL equivalent of "Albert is a cat", we would be very dubious of the purported translation, even if we had no knowledge of the target language. However, this line of thinking begins to bog down when we consider whether we would want to include what might be called trivial entailments, for instance, from "Albert is a black cat" to "Albert is black cat and $\mathcal{P}$", where $\mathcal{P}$ is the proof of Fermat's Last Theorem, which as a mathematical proof, and so necessary, must be entailed by any sentence. This makes the preservation of entailments an unattractive requirement, since it would make the

successful translation of sentences about cats contingent on whether the target language can express mathematical and logical truths.

The main authors we will discuss in the next chapter were sensitive to this issue, although they wished to retain the preservation of entailments of an appropriate sort as a necessary condition on translation. Katz (1972) marked a distinction between *semantic entailments*, a relation which depends on natural language sentence meaning and does not include the sort of trivial entailments discussed in the preceding paragraph, and *logical entailments*, which are a matter of the laws of logic. His main antagonist, Keenan, moved from speaking about entailments (1974) in his initial treatment of translatability to *inferences* (1976,1978) which, although not strictly defined, seem to have been limited to the direct implications of a sentence (e.g., from "Albert is a cat" to "Something is cat" but not to "Propositional Logic is sound and complete"). Both of these ideas will be discussed further in Chapter II, but the present point is that something defined along either of these lines would be a far more reasonable requirement on successful translation than a notion of preserving entailment carried over from formal logic.

Another condition that might be suggested as necessary would be a semantic version of Kocurek's *translational equivalence*, which, recall, requires that the SL sentence in question have a TL translation that can then be back-translated in such a way as to arrive at a sentence equivalent to the original. For reasons already discussed, this is too weak, and what is desirable among natural languages would be the requirement that the back-translation result in an identical, or nearly identical, sentence. But in any case if we translated "Albert is a cat" into the nearest TL equivalent, and that sentence translated back into English as "Albert is a mammal", it seems that there is a very clear failure of translatability and that the TL would have less

expressive power than English in this respect. In fact, this seems like this is just a commonsense condition on translation.

As we have seen, there are many definitions of "translation" on offer for formal languages. However, these definitions are, in most cases, not so much competing as they are simply different, and useful for different research interests. This is reflected in the fact that is possible to arrange different definitions in a hierarchy of increasingly restrictive criteria, as Kocurek has done. This suggests that a similar approach may be suitable for NLs as well, so that question of translatability between two languages, or all languages, is not an all-or-nothing affair but rather a matter of degree. In fact, this is the strategy employed by Katz (1976,1978, see Chapter II, §3), although the actual hierarchy that Katz establishes is somewhat questionable. Certainly, if we could identify some level at which all human languages are intertranslatable, even if that level were lower on the hierarchy than always being able to find a truth-conditionally equivalent TL sentence for any SL sentence, that in itself would be an interesting result.

The concept of *notational variant* ran through this chapter, and we saw that here, too, there is disagreement on how the notion should be defined. Although Kocurek devoted a large amount of space to discussing the issue, in the end he noted that there may be no single definition of either this concept, or of, more generally, what it means for two languages to be equivalent in expressive power (Kocurek 2017,2018). We might apply the idea of notational variant to NLs as well, so that two languages that are simply using different means to express exactly the same meanings, under some well-defined sense of *meanings*, would be regarded as notational variants. As we will see in the next chapter, Katz was arguing that such a relation attains between *all* NLs, modulo certain pragmatic aspects, while his main opponent, the linguist Edward Keenan, argued that *no* natural languages have this status! However, this disagreement is

importantly different in nature from that between logicians. For those concerned with logic, the disagreement is over how the intuitive notion of *notational variant* should be defined, not about what pairs of formal languages fall under any particular definition. For those concerned with NLs, there is disagreement about the correct definition of translation, but there is also heated debate about what pairs of languages are translatable under any given definition, and most of the literature concerns this latter problem.

A final question to consider is whether schematicity or compositionality should also be a requirement on translation between natural languages. This may seem, at first, like a very natural requirement, since compositionality is a "fundamental presupposition of most contemporary work in semantics" (Szabó 2020). In particular, it is "foundational to Montague Grammar" and modern work in that formal tradition (von Fintel and Matthewson 2008:172). However, if we were to require compositionality in the way that Kocurek defines it (2017:11, see previous section), this would introduce an undesirably strong constraint. For example, the most natural translation of "it is cold" into Russian is "Холодно", literally "cold", the pleonastic "it" having vanished from the TL sentence. It seems as if we may want to view such a compositional translation as one level in a hierarchy, but compositionality would be much too restrictive of a criterion to place on a base level of simple translation. A base level similar to what Kocurek calls schematicity would also not be appropriate, since it is defined in syntactical terms. As Katz argued in defining his hierarchy, preserving syntactical features under translation may be a required for some high level of translational equivalence, but for most purposes of philosophical interest we would prefer a base notion of translation defined entirely in semantic terms (Katz 1978:226, this is discussed in more detail in the next chapter).

In any case, it might be argued that no notion along the lines of either compositionality of schematicity is needed in the investigation of NL translatability. Recall the sort of cases that these criteria were initially introduced to rule out. For instance, although we know that a bijective function exists between FOL and classical propositional logic that preserves consequence, such a mapping is not an indication that the two systems are notational variants because any such a mapping must be highly complex and arbitrary, and certainly not compositional. It is not even clear what an analogous situation with NLs would amount to. Since the minimal requirement on translation between NLs is to preserve meaning, this sort of arbitrary mapping between two natural languages is simply not a consideration, as it would fail to be a translation at all.

Many of these themes will be revisited in upcoming chapters. We should turn now to natural languages.

Chapter 2: Katz, Keenan, Effability and Translatability

"All translating seems to be simply an attempt to accomplish an impossible task"
(von Humboldt, letter to Schlegel)

§0. Introduction and Definitions

The view that one specific language or another may be the only medium suitable to express some particular idea, or class of ideas, seems to have been the prevalent assumption throughout most of human history, even if it has seldom been explicitly argued for in any detail. Thus, we find, for example, the privileged place of Latin in the intellectual life of Europe prior to the 17th century, or, for the expression of spiritual messages, of Sanskrit in the Hindu world and of Arabic in Muslim nations. In America and Europe, well into the 20th century, the view of European languages as superior in their expressive power to those of less technologically advanced societies was common enough that early anthrolinguists such as Boas (1911) and Sapir (1949) were compelled to argue in opposition to this this idea. Sapir in particular cautioned against such an error and proposed that all languages are complete in their ability to communicate a speaker's meanings, a position also defended by Jakobson (1959, Sapir and Jakobson will be discussed further below). But it was Katz who argued in favor of universal effability and translatability in by far the most detail and at the most length (1972,1976,1978,1981).

Katz took as his point of departure that the ability to fully express *any* proposition is the fundamental characteristic setting natural human languages apart from other systems of animal communication, on the one hand, and the sort of formal languages we examined in the last chapter on the other. Thus, all natural languages (NLs) have the capacity to express all propositions. This would entail that all NLs have equal expressive power; no language would be

able to express anything that is not expressible in another language. *Ipso facto*, this would ensure full translatability between all NLs. Katz's philosophical motivations appear to have been twofold. First, he was determined to provide a conclusive response to Quinean indeterminacy. This aspect of Katz's work will not play a large role in this dissertation, as it is orthogonal to my concerns. I am assuming throughout that there are determinate facts regarding the meaning of linguistic expressions, ultimately based in the mental states of language users, and I am probing the question of whether all languages can express all of the same meanings. The justification for this assumption, which is based in a complete rejection of Quine's behaviorist framework, is a topic for a different work. Secondly, Katz was attempting to extend existing work on Universal Grammar (UG) with a full theory of semantics that would be analogous to Chomsky's work in syntax. Katz saw it as a consequence of UG that the expressive capabilities of all languages will be genetically determined and so invariant across human populations (Katz 1978), however, as will be discussed later, this conclusion goes far beyond anything in the mainstream of Chomskyan linguistics.

Katz's views form a convenient stepping off point for any discussion of translatability because they at least seem to be carefully defined enough to represent a concrete and testable claim. As a result, they are frequently referenced in the subsequent literature. Therefore, the bulk of this chapter will be devoted to exploring his position in some detail. The next section will discuss historical precedents, including Frege, Sapir and Jakobson. §2 will examine Katz's *Principle of Effability*, the claim that any proposition can be expressed in any language, as well as his motivations for this proposal. §3 will be devoted to Katz's specific definition of translation- the only fully explicit one in the literature- and his *Principle of Translatability*. §4 will introduce the UCLA linguist, Edward Keenan, who proposed a rival *Weak Effability*

Hypothesis and engaged in a running battle with Katz throughout the 1970s. §5 will compare and contrast the different conceptions that Katz and Keenan worked under as far as what constitutes a language and how a language might be augmented for purposes of translation; this is an important issue that will be revisited in the final chapter of the dissertation. In §6 we will look at the types of counterexamples which Keenan proposes, and Katz's general strategy to defend his principles. Particular attention will be given to the discussion of presuppositions, as the possibility of preserving presuppositions under translation became a central point of contention in the literature. Detailed discussion of specific cases will be postponed for the next chapter.

Before continuing, we should set out the definitions of Katz's two principles, which will often be referred to in what follows. A moment's reflection shows that the first principle entails the second, but the converse relation does not hold.

> **(*E*) Principle of Effability** (1978:209): "Each proposition can be expressed by some sentence in any natural language".
>
> **(*T*) Principle of Translatability** (1978:206): "For any pair of natural languages L_i and L_j and for any sentences S in L_i, and for any sense [i.e., proposition expressed] σ of S, there is at least one sentence S' in L_j such that σ is a sense of S'."

§1. A Brief History of Effability and Translatability Before and After Katz

This section will examine some other major figures in philosophy and linguistics who ventured a position similar to ***E*** and/or ***T***. This discussion will necessarily be briefer than would be ideal, because, aside from Katz and his direct critics, most authors expressed their positions on these topics through a few scattered comments contained in works on other subjects. The first two subsections will discuss in some detail the positions of Edward Sapir and Roman Jakobson,

important linguists who endorsed a version of ***T***. The third subsection will concern the three philosophers, Frege, Tarski and Searle, who Katz cites as predecessors, and will analyze the short passages in the work of those three authors that Katz was drawing on. The final section will take a highly condensed look at a few contemporary linguists who have more recently taken up positions resembling those of Katz.

§1.1 Sapir

The American linguist Edward Sapir was among the first (preceded only by Frege) to propose something approaching Katz's position in a published work. Although he is best known for his advocacy of a very general version of linguistic relativism, further developed and made famous by his student Benjamin Lee Whorf, Sapir had views on effability and translatability that were remarkably similar those later expressed by Jakobson and then Katz.

During the early part of the 20th century, it was a commonly held opinion that cultures and their languages could be placed along an evolutionary scale, with Australian and American languages ranking particularly low in terms of their suitability to express complex thought[26]. Sapir, an experienced field linguist who possessed an impressive familiarity with a wide range of these languages, observed that some cultures may be considered "primitive" in the sense that their level of technical, scientific, or philosophical development is limited, along with the vocabulary used to discuss these fields. Still, he maintained that the languages spoken by these cultures are complete in that a speaker will be able to find a way, should the need or desire arise, to articulate any thought expressible in English, French or any other language. In his words, (1924:151):

[26] As an example, see Jespersen (1894,1922), also see Moore (2017) for discussion of these views.

> The outstanding fact about any language is its formal completeness. This is as true of a primitive language, like Eskimo or Hottentot, as of the carefully recorded and standardized languages of our great cultures…we may say that a language is so constructed that no matter what any speaker of it may desire to communicate, no matter how original or bizarre his ideas or his fancy, the language is prepared to do his work….

Sapir was expressing in that passage the position that mere limits in vocabulary are not a hindrance to effability or translatability, a thought that would be echoed by subsequent authors. Whenever there is a deficiency, it can be paraphrased or analyzed away, although as a purely practical matter it may sometimes be more expedient to simply import or coin a new word. The essential fact is that the syntax of any NL, its "formal apparatus", will be capable of supporting these rearrangements or additions, and will allow the recalcitrant thought to be expressed. Although in practice there may be limitations with extreme cases, in theory nothing is untranslatable into any language with enough effort on the part of the translator (1924:152-53):

> Formal completeness has nothing to do with the richness or the poverty of the vocabulary. It is sometimes convenient or, for practical reasons, necessary for the speakers of a language to borrow words from foreign sources as the range of their experience widens. They may extend the meaning of words they already possess, create new words out of native resources on the analogy of existing terms, or take over from another people terms to apply to the new conceptions which they are introducing…It would be absurd to say that Kant's "Critique of Pure Reason" could be rendered forthwith into the unfamiliar accents of Eskimo or Hottentot, and yet it would be absurd in but a secondary degree. What is really meant is that the culture of these primitive folk has not advanced to the point where it is of interest to them to form abstract conceptions of a philosophical order. But it is not absurd to say that there is nothing in the formal

> peculiarities of Hottentot or of Eskimo which would obscure the clarity or hide the depth of Kant's thought…it is not absurd to say that both Hottentot and Eskimo possess all the formal apparatus that is required to serve as matrix for the expression of Kant's thought.

He concludes (1924:154):

> All languages are set to do all the symbolic and expressive work that language is good for, either actually or potentially.

This amounts to a less formal statement of ***T***. However, note the caveat "that language is good for". Elsewhere in the same article, he states that all languages are capable of expressing "all experience, in so far, of course, as experience is capable of expression in linguistic terms" (152). Sapir is stopping short of endorsing a position on effability as strong as ***E***. All languages may be capable of expressing the same range of thoughts, but Sapir leaves open the possibility that this range might be inherently limited by the existence of a gap between mental activities and their verbal expression which cannot be closed in any language.

Despite this hedging on the subject of effability, Sapir was still making quite sweeping claims concerning the relative expressive power of NLs. The positive argument is surprisingly sparse for such a weighty conclusion. Sapir proceeds by way of an example (1924:154). Many societies, for instance, the Inuit, will have no need to speak of the abstract philosophical notion *causation*. But the method of expressing a type of action as an entity is as familiar to the Inuit as to English speakers, meaning that this form of expression is available to them as well and can easily be used to capture the notion in question, *act of causing*, just as well as an English speaker might with the word *causation*. If such an expression was not available in the language, other "formal patterns" would be available

> that eventually do the same work. Hence, 'laughter is pleasurable', 'it is pleasant to laugh', 'one laughs with pleasure' and so on ad infinitum, are functionally equivalent expressions, but they canalize into entirely distinct forms.

"Form" appears to mean something like "grammatical device" in Sapir's writings, and it seems that Sapir rests his confidence in universal translatability on the theory that if a form is available to express a thought in one language, some form can be found in any language suitable to express that same thought. Of course, conclusively establishing this would be difficult if not impossible, but Sapir is appealing to the idea that among the many ways usually available to say the same thing in a single language, at least one among them must be available in any given language.

Ultimately, Sapir's confidence in this matter is most likely founded in his conception of a language as a complete reference system which picks out coordinates in a semantic space.

> The world of linguistic forms, held within the framework of a given language, is a complete system of reference, very much as a number system is a complete system of quantitative reference or as a set of geometrical axes of coordinates is a complete system of references to all points of a given space. (1924:151)

The system of reference may differ in character between individual languages- thus the linguistic relativity with which he is associated- but the semantic space being referred to is universal, set by human psychology. If a particular language lacks an immediate means to pick out some particular spot in that space, say, *causation*, that language can be extended or stretched to fill the shortcoming, as discussed above. If no form was available, then the system of reference for that language would be incomplete, contradicting this principle of completeness, which he viewed as a fundamental characteristic shared by human languages beneath their

seemingly endless surface variety. This particular aspect of Sapir's views was very similar to Katz's conception of semantics, as will be discussed in §2. Indeed, this idea of NLs as essentially a labelling system for a conceptual space shared by all humans is a widespread one, shared in some form by Fodor (1975), Pinker (1994), Li and Gleitman (2002) and sometimes Chomsky (1997).

§1.2 Jakobson

Roman Jakobson (1896-1982), a seminal figure in the Prague School of linguistics whose work in phonetics inspired many aspects of Chomsky's approach to syntax, came to conclusions nearly identical to those which Katz would later arrive at, apparently completely independently. In 1959 he penned a short but highly influential paper, "On Linguistic Aspects of Translation", that has been often cited by philosophers, linguists and scholars of translation studies but is rarely discussed in any detail.

In a frequently quoted passage, Jakobson (1959:234) endorsed a stance on effability equivalent to ***E***:

> All cognitive experience and its classification is conveyable in any existing language. Whenever there is a deficiency, terminology may be qualified and amplified by loanwords or loan-translations, neologisms or semantic shifts, and finally, by circumlocutions. (1959:234)

It is notable that this statement is not hedged in the way of Sapir's formulations, but the strong position that "*all* cognitive experience" is expressible is never argued for. Instead, Jakobson concentrated on building a case for universal translatability, and so equivalent expressive power among all NLs. As stated in the passage above, and for reasons similar to those

given by Sapir, mere differences in available vocabulary between languages are taken to be unimportant. Of course, some position to this effect is necessary for any advocate of universal translation, because it is immediately apparent that the vocabulary of any two languages will never line up in one-to-one correspondence[27].

An important part of Jakobson's argument is the observation that translation, the replacement of a linguistic unit by others that might be better understood or more appropriate in context, occurs frequently *within* languages as well as between them[28]. Some sort of translation is taking place any time a word is defined, or a sentence is rephrased. At the level of individual words, complete synonymy is very rare, for instance, no other word in English has the exact meaning of *bachelor*. Yet, the meaning can be captured by a combination of other units, such as *unmarried man*[29] (Jakobson 1959:233). Thus, while an exact word-for-word translation between

[27] Hjelmslev provides a classic illustration that this is true even of common vocabulary in closely related languages (1943:50)

<table>
<tr><th>English</th><th>German</th><th>Danish</th><th>French</th></tr>
<tr><td>Tree</td><td>Baum</td><td rowspan="2">Trae</td><td>Arbre</td></tr>
<tr><td rowspan="2">Wood</td><td rowspan="2">Holz</td><td rowspan="3">Bois</td></tr>
<tr><td rowspan="3">Skov</td></tr>
<tr><td>Woods</td><td rowspan="2">Wald</td></tr>
<tr><td>Forest</td><td>Foret</td></tr>
</table>

Incidentally, Hjelmslev can also be counted as among those who advocated something like ***E*** and ***T***: "A language is a semiotics into which all other semiotics can be expressed" and "in a language, we may work over the inexpressible until it is expressed" (1943:109).

[28] Jakobson's observation should not be confused with the position that *all* communication is, at some level, an act of translation, an idea which has been endorsed by, among others, Steiner (1975) and Hofstadter (1997). Steiner, a seminal figure of contemporary translation studies, stated that "[T]ranslation is formally and pragmatically implicit in every act of communication, in the emission and reception of each and every mode of meaning…To understand is to decipher. To hear significance is to translate" (1975: ix). On a sufficiently broad sense of *translate* this almost undisputable, but this is not the sense which Jakobson, Katz or other major figures where concerned with.

[29] Of course, one can immediately point to problems with this example, which are even more apparent when Jakobson continues with "every bachelor is an unmarried man, and every unmarried man is a bachelor" (1959:233). The second conjunct seems invite consideration of a large number of difficult cases, such as whether we should call the Pope a *bachelor*. These sorts of issues are likely to reoccur with any predicate that one cares to choose. But these problems, while potentially serious for some of the thinkers who will be discussed in this chapter, are largely irrelevant for Jakobson, who was concerned with the use of language by an individual to communicate a thought in such a way that an addressee could understand, not with formal semantics or the exact

languages will rarely be possible, this is unimportant, as such a situation does not normally obtain within a single language, either. Instead, the unit of translation is the entire *message*, where equivalency is easier to come by.

Jakobson supported his argument with examples of overcoming deficiencies in vocabulary, drawn from his knowledge of minority languages spoken in the far reaches of Russia.

> [I]n the newborn literary language of the Northeast Siberian Chukchee, "screw" is rendered as "rotating nail", "steel" as "hard iron", "tin" as "thin iron", "chalk" as "writing soap"….(1959: 234-35).

Clearly, Jakobson's theory, which allows a translator to render "chalk" into a language with no equivalent word by using a phrase literally equivalent to "writing soap", rests on "a dynamic view of natural languages as evolving entities" (Pym and Turk 2008: 275). This is an important point, but because it is a property that he shares with many other key figures in the discussion (notice that Sapir expressed similar ideas), extended consideration will be delayed (we will return to this issue in §5 of the current chapter and it will also be treated extensively in chapter IV). For the moment, it should simply be noted that NLs are, in fact, in a constant state of evolution, a fact for which Jakobson had gathered plentiful evidence from his work not only on languages such as Chukchee, which were changing rapidly as the speakers became more integrated into the modern world, but also Russian during the early years of the Soviet era.

Further, Jakobson asserted that no language lacks the "grammatical devices" to translate all the "conceptual information" of the source language (SL) message (1959:235). As with Sapir,

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extensions of predicates. For an English speaker without the word *bachelor* in their lexicon, paraphrase by *unmarried man* is sufficient for most purposes, when it is not, the relevant concept can be further specified as needed.

he provided an example rather than a sustained argument, citing a Samoyed language possessed of only a single sentential connective to play the role of both conjunction and disjunction. Yet, a speaker of this language can specify additional information to cover either of these meanings: the equivalent of "John and/or Peter both…" can be used for conjunction or "John and/or Peter, one of them…" for (inclusive) disjunction (1959:2365)[30]. Presumably, this example of an extreme case is meant as an illustration of the sort of devices that Jakobson was asserting will always be possible.

As a practical matter, Jakobson noted, translation between languages with very different grammatical structures can be a demanding process. When the grammar of the SL requires that a well-formed sentence contain information that is normally left unspecified in the target language (TL), this extra information must be conveyed somehow, which may at times result in a lengthy and unnatural construction, but which is seldom seriously problematic. The Samoyed case above is an example. Another is the translation of the Old Russian брата, the dual form of брат, *brother*, into English as *two brothers* (1959:235). Even though in the TL the dual is not normally specifically marked beyond the *-s* used for any plural, since that information is contained in the Old Russian it must be specified.

The reverse situation, in which the SL leaves unspecified some information that is required in the TL, can prove considerably more challenging. Jakobson notes that "I hired a worker" cannot be accurately translate into Russian without more context; among other issues, nouns must be marked for gender in that language. Likewise, the equivalent Russian sentence could not be accurately translated into English without supplementary facts; since Russian

[30] One noteworthy point about this case is that, although it seems to clearly be a translation, it is not "compositional" in the sense discussed in Chapter I (§2,3), since the phrases "both" and "one of them" in the target language sentences have no counterpart in the source language. Such examples point, again, to compositionality being an unsuitable requirement for natural language translation.

normally does not use articles, we would not know whether to use "the worker" or "a worker" (1959:236)[31]. While these seems to be in conflict with the previously stated principle of effability, a solution is possible if one is willing to make a choice between picking an arbitrary value for the missing information or sacrificing naturalness and resorting to a disjunction (1959:235).

> When translating the English sentence "She has brothers" into a language which discriminates dual and plural, we are compelled to make our own choice between…. "She has two brothers"- "She has more than two" ….or… "She has either two or more than two brothers." Again, in translating from a language without grammatical number into English one is obliged to select from one of the two possibilities- "brother" or "brothers" or to confront the receiver of this message with a two-choice situation: "She has either one or more than one brother."

Thus, Jakobson concludes, even though a trade-off of sorts is necessary, balancing conciseness and naturalness against accuracy, it is possible to handle these sort of problem cases in such a way as to preserve all of the information content of the original. This leads to his most famous observation (159:236, italics in original):

> Languages differ essentially in what they *must* convey and not in what they *may* convey.

This position has been enormously influential and remains popular among both translation theorists and linguists. In their survey of semantic universals, von Fintel and Matthewson note of this conclusion that "this is indeed pretty much what one finds" (2008:146), even as they reject Katz's particular formulation of ***T*** (for reasons to be discussed in Chapter III,

[31] A Russian-speaking informant indicated that the masculine gender can be used felicitously when the gender of the worker is unknown. Jakobson, a native Russian speaker, was surely aware of this practice, perhaps he was ignoring this fact for illustrative purposes.

§2). Jakobson's position on translatability also seems to form a central, if rarely explicitly articulated, principle underlying the semantic interpretation of fieldwork data. Amy Rose Deal, whose work has provided a damaging counterexample to ***T*** (Deal 2011, see chapter III, §3) described his views as the "received wisdom" in which she was indoctrinated during her early training as a linguist (Deal 2014:4).

§1.3 Frege, Tarski and Searle

Surprisingly, Katz never discusses Sapir or Jakobson. Instead, he cites three well known philosophers, stating that "The principle I have called 'effability'…was propounded in somewhat different form by Frege…Tarski…and Searle" (1978:209). Elsewhere he calls the views of these three "…other versions of the same principle" (1972:19). In this subsection, I will discuss the connections between Katz and these authors.

The passage in Tarski on which Katz seems to be drawing is a brief one contained in a longer argument against the possibility of defining a truth predicate for natural languages[32]. Tarski compares *colloquial languages*, or NLs, with *scientific languages*, by which he means the artificial formal systems employed by logicians (1956:164-65):

> A characteristic feature of colloquial language (in contrast to various scientific languages) is its universality. It would not be in harmony with the spirit of this language if in some other language a word occurred which could not be translated into it; it could be claimed that "if we can speak meaningfully about anything at all, we can also speak about it in colloquial language".

[32] Katz is not alone in citing this passage as an endorsement of ***E***, e.g., von Fintel and Matthewson (2008), Pym and Turk (2008).

Tarski's concern here is to show that because NLs might be used to *express semantical antinomies* (i.e., liar sentences), consistent use of the expression *true sentence* or equivalent is impossible (1956:165). However, the commitment to the "universality" of natural language certainly seems to anticipate Katz's ***E***. Tarski does not attempt to argue for this position with any analysis of linguistic data, rather, he seems to be appealing to the nature of NLs. As he had stated just previously in the same work concerning natural language (1956:164):

> [T]his language is not something finished, closed, or bounded by clear limits. It is not laid down what words can be added to this language and thus in a certain sense already belong to it potentially.

This is the "dynamic view" of language shared by Jakobson and Sapir (and Katz, as will be discussed below), which occasions the position that if an immediate means to express some proposition is not immediately available, the language can always be extended to cover the gap. Note, however, that Tarski's view is subtly different and stronger. The boundaries of a language are its potential for growth- "in a certain sense" the extensions of a natural language to capture new meanings are already a part of that language. On this view, NLs are truly limitless and universal in their expressive capacity[33].

[33] It is important to keep this argument separate from Tarski's claim that no *formal* language can contain its own truth predicate (Tarski 1956, see Chapter I, §1). Otherwise, there may appear to be a tension between the proposed universal character of natural language and the very claim that is meant to support- the inability of a NL to have a predicate referring to all and only the true sentences of the language. The claim is not that a natural language cannot contain a truth predicate, or the expression "true sentence" is meaningless, rather it is that the predicate cannot be consistently applied, i.e., its extension cannot be defined (Tarski 1956:165).

Turning to Searle, Katz cites his early work (Searle 1969: 19-21) where the *Principle of Expressibility* is proposed. Searle himself would later summarize this as "the principle that whatever can be meant can be said" (Searle 1979: 134)[34].

Searle's concern had been to reconcile two apparently different approaches to the philosophy of language by demonstrating that "a study of the meaning of sentences is not in principle distinct from a study of speech acts" (1969:18). "Speech acts" are well-defined messages that a speaker intends to convey and that a listener understands when communication is functioning properly. In contrast, actual utterances tend to be ambiguous, elliptical, context dependent and may rely on non-literal meanings or other pragmatic devices. Searle's strategy was to argue that the gap between speech acts and verbal behavior was merely an unimportant consequence of speakers abbreviating their utterances for purely practical purposes. Theoretically, if desired, a speaker might always use a longer sentence that would make the intended speech act fully explicit. Thus, "cases where the speaker does not say exactly what he means…are not theoretically essential to linguistic communication" (1969:20).

Searle backs this position with examples such as the following (1969:19 italics added):

> If you ask me "Are you going to the movies?" I may respond by saying "Yes" but, as is clear from the context, what I mean is "Yes I am going to the movies" …Similarly I

[34] This is obviously an uncomfortable fit with Searle's later position that understanding a sentence requires understanding a vast number of presuppositions that are never all made explicit. Although Searle never renounced Expressibility, it played less of a role in his more recent work and in fact seems to contradict it to an extent (Recanati 2003). On close inspection, a similar tension seems to run through Katz's discussion of ***E***: are the semantic resources of a language, separated from pragmatics and speaker knowledge, *ever* really adequate to express thoughts *exactly*? For instance, can any finite sentence, of any language, actually capture what the speaker wants when uttering "Please bring me a veggie burger" while excluding cases in which the burger arrives enclosed in concrete, weighs a hundred pounds, and so on? However, the problem is less concerning for translatability, which is understood to be a relation holding between the sentences of a language. What is required by ***T*** is that a synonymous sentence be available in the target language, not that the thought expressed be captured with perfect adequacy in either language.

> might say "I'll come" and…mean it as I would mean "I promise that I will come" if I were uttering that sentence and meaning literally what I say. In such cases, even though I do not say exactly what I mean, it is *always possible* for me to do so…

Katz identifies Searle's position with ***E***, as does at least one later expositor of Searle (Recanati 2003), and at times Searle seemed to have this view himself ("whatever can be meant can be said"). However, examining his actual argument, as sketched above, shows that the Principle of Expressibility is somewhat similar in spirit to but importantly distinct from ***E***. Searle's point is simply that, as a matter of convenience, everyday speech is very seldom fully explicit, but abstracting away from time and performance errors, it could be made so. This leaves unsettled the sorts of questions which concerned Sapir, Jakobson and Katz, such as whether "causation" might be expressed in an Inuit language or whether "neutrinos have no mass" might be translated into a hypothetical "jungle language" (a famous example from Quine (1960) discussed by Katz (1978:219)). These later examples concern questions about whether all languages have the resources to discuss certain propositions, not whether or not implicit information can be explicitly filled in. It seems that whether Searle intended his principle as something like ***E*** or not, it is far too slender of a foundation for such a weighty hypothesis.

Katz states (1972:19) that ***E*** was "to the best of my knowledge, first suggested by Frege" and he cites the following passage (Frege 1963:1)

> It is astonishing what language can do. With a few syllables it can express an incalculable number of thoughts, so that even a thought grasped by a human being for the very first time can be put into a form of words which will be understood by someone to whom the thought is entirely new.

Given that Fregean "thoughts" are identical to Katz's "propositions", the principle expounded here is identical to E^{35}. What is notable is that Frege treats effability not so much as a hypothesis in need of supporting evidence or argument as a fact in need of explanation, an approach shared with Katz (see §2). Thus, he continues the passage:

> This would be impossible were we not to distinguish parts in the thought corresponding to the parts of a sentence, so that the structure of the sentence serves as an image of the structure of the thought.

Frege seems to be expressing two ideas here, which are made somewhat clearer in the ensuing discussion. First, for each basic component of a proposition, we can identify a basic component, or morpheme, in the sentence expressing it. Frege admits that this is somewhat loose, but shrugs off the difficulty:

> We really speak figuratively when we transfer the relation of whole and part to thoughts; yet the analogy is so ready to hand and so generally valid that we are hardly ever bothered by the hitches which occur from time to time.

Secondly, the functional components of the sentence (e.g., conjunction, negation) which link and arrange other morphemes into complex arrangements correspond to matching elements of the Third Realm which, although not themselves propositions[36], link propositions into complex structures. This ensures that not only is human language productive, i.e., can produce an infinity

[35] At least according to Katz's interpretation of Frege. Whether this was actually what Frege meant might perhaps be debated, although it seems a reasonable conclusion from the assertation that even a proposition being ascertained by a human for the first time can be put into words, and the way that the passage continues (discussed next in the main text). I will not enter into this problem of exegesis here, partly because it is tangential and partly because it would likely require a minute examination of the cited paper in the original German. If desired, the reader can substitute *Fratz*, or "Frege according to Katz", for any mention of Frege in the next few paragraphs.

[36] Because "[A] thought is complete and fulfilled, and needs no completion…" (Frege 1963:2). So, "[T]houghts do not cleave to one another unless they are connected by something that is not a thought". The reader may find that all this is all starting to seem very mysterious, but as our purpose is not Frege scholarship I will not continue down this gavagi-hole.

of sentences, but also that it can construct a sentence whose structure matches that of any compound proposition[37].

Or, as Katz succinctly put it (1972:19)

> Frege's version of the principle might be explicated as follows: anything that is thinkable is communicable through some sentence of a natural language (because the structure of sentences mirrors the structure of thoughts).

It is worth noting that, like Sapir, Jakobson and later Katz, Frege disregards the non-functional lexicon as an unimportant consideration- in fact, Frege does not even bother to discuss vocabulary aside from the logical connectives! Instead, it is the structural properties of language that matter, and, on Frege's theory of language, these are a mirror image of the structural properties of propositions, allowing effability to obtain.

Frege's mention of putting a proposition "into a form of words" reflects a key element of his philosophy of language, that of natural languages as essentially systems for labelling propositions. With this view, if one assumes that the human ability to "grasp" propositions is fairly uniform, ***T*** should follow, and indeed Frege seems to have drawn this conclusion (1892: 196, fn):

[37] When discussing authors who define effability in terms of propositions, it may occur to the reader that the sentences of a natural language are countably infinite, while, although accounts of exactly what propositions are may vary, there must be an uncountable number of them. One way of showing is to reflect that for each real number x, there is a proposition stating that it is greater than each real number y (many of these will be false propositions, but still propositions). Katz took himself to have an answer to this objection (see §2, below). Although Frege does not specifically consider this problem, it seems that the key is in the phrase "thought grasped by a human". The claim is then that when a human "grasps" (roughly, "thinks") a proposition, such as that a real number is larger than some other real number, they will be able to construct a linguistic expression for that proposition, not that there must be some sort of pre-existing sentence available for each proposition whether a human ever thinks of it or not. Since there will only ever be a countable infinity of propositions grasped by humans, there is no contradiction.

> Nowadays people seem inclined to exaggerate the scope of the statement that different linguistic expressions are never completely equivalent, that a word can never be exactly translated into another language…. I would only emphasize that nevertheless different expressions quite often have something in common, which I will call the sense, or, in the special case of sentences, the thought. In other words, we must not fail to recognize that the same sense, the same thought, may be variously expressed; thus, the difference does not here concern the sense, but only the apprehension, shading or coloring, and is irrelevant for logic…for all the multiplicity of languages, mankind has a common stock of thoughts.

There are at least two items contained in this remarkable but seldom discussed footnote that are worth calling attention to in the present context. The first is that only the core logical properties of sentences are considered in determining whether they might be synonyms of one another, or, in the case of different languages, translations. Other characteristics that a sentence may have, e.g., its "coloring", are regarded as unimportant in assessing translation. This concentration on logical properties, such as entailment, would form a key part of Katz's definition of translation, as well as that of Keenan. The second notable point is the way that the passage relies on the same observation that Jakobson would later make, that translation is a normal process within languages as well between them, as all definition and paraphrase is a sort of intralinguistic translation. In fact, the footnote continues by arguing for the correctness of this view, and notes that if it is denied "…all definitions would then have to be rejected as false".

§1.4 After Katz

While Katz himself seems to have moved on to other topics in the 1980s, more recent authors continue to endorse versions of effability and translatability, although generally in

somewhat more cautious terms. As noted previously, von Fintel and Matthewson (2008) advocate for a weakened version of ***T*** (in the sense that the conditions for what counts as a translation are less stringent than those advocated by Katz, see §3). Deal, who initially argued strongly against Katz and Jakobson (2011) came, on reflection, to endorse a variety of ***T*** (2014) (Deal's fieldwork and the conclusions that she drew from it concerning translatability will be discussed in Chapter III, §3).

The Rutgers's linguist Mark Baker, searching for an explanation of why so many apparently diverse NLs had sprung from a single universal grammar, mentions effability (Baker 2001:219):

> The ability to speak different languages does not increase biological fitness by increasing the number of things that one can talk about. Each language contains the flexibility to talk about virtually anything.

Although this position is weaker than ***E*** (note the caveat "virtually"), Baker regards it as enough for something like ***T*** (2001:233 italics added):

> Even though *all languages can express all ideas*, this does not mean that all languages express those ideas with equal ease. It is easy to find instances in which what is said simply and directly in one language may require a lengthy circumlocution in another.

This may seem incompatible with the first quote given above ("virtually" vs. "all"). Reading Baker charitably, he may have intended this to mean that all NLs can express all ideas that are expressible by any NL, that is, as endorsement of equal expressive power (***T***) but not of the stronger position that anything thinkable must be expressible. This seems to be the position that Baker goes on to endorse (2001:234 italics added):

> Even though all languages may express the same propositions, they clearly will not all support the same poetics.

Thus, Baker's position on translatability is very similar to that of Sapir and especially Jakobson (and Katz, as we will see shortly). This includes the same emphasis on the flexible nature of language, and the caveats that translations may be long, contorted or otherwise unnatural in the TL, and that properties such as poetic qualities cannot always be preserved (as Frege and Katz also conceded).

In fact, Baker goes further than Katz in some ways. Baker's main project was a fully developed theory of "parameters", in Chomsky's sense of variable settings in the core universal grammar whose value would vary between natural languages (Chomsky 1981,1986; see Chapter IV, §3, for a discussion of parameters and their relation to translatability). He argued that not only is translation always possible, but can be carried out systematically by an algorithmic process of reversing the parameter settings of the SL when they differ from those of the TL (Baker 2001:233):

> Languages are significantly different but commensurable…Thus a Japanese sentence can be matched to an English one by an algorithmic process of reversing the order of heads and phrases. An English sentence can be matched to a Mohawk one by systematically dislocating the noun phrases. The problems increase when several parameters interact at several levels and when lexical differences are thrown in as well. Still, translation from one language into another should be difficult but possible.

This is certainly a very intriguing passage, although we will see in the next chapter that not only is it far from clear that translation is always possible, but one of the major obstacles to successful translation is that the syntactical structures of some languages (their parameter

settings, in Baker's terms) do in fact seem to be incommensurable in semantically significant ways[38].

Mention should also be made of the theory of the Natural Semantic Metalanguage (NSM), proposed in the work of Anna Wierzbicka and Cliff Goddard (Wierzbicka and Goddard 1995; Wierzbicka 1996). By this theory, the lexicon of every natural language contains a number of semantic *primes*, words which represent basic concepts, and which cannot be defined in terms of simpler words. Each language contains the same primes[39] as lexical primitives, so that the primes of any NL have an exact equivalent in any other NL. The theory holds that these primes can be used in conjunction with functional lexical items to express any concept that can be expressed using language:

"The primitives and their rules of combination constitute a kind of mini-language with the same expressive power as a full natural language" (Wierzbicka and Goddard 1995:42). As all languages are equipped with precisely the same set of primes, ***T*** follows.

[38] Baker's (frustratingly short) remarks about effability and translatability were a fitting close to a book that opened by discussing a well-known historical event which serves as an excellent illustration of the inherent interest of translation. Native Navajo speakers were employed extensively to conduct secure radio communications throughout the Pacific Theatre of World War II. Even the most sophisticated methods of encrypting English language messages were deciphered by Japanese cryptographers, while a relatively very simple system of code-words protected messages in Navajo from intensive efforts at decoding. This was despite the fact that the Japanese knew that the encoded language was Navajo! Baker attributed this remarkable story at least partially to the morphological complexity of Navajo. But at the same time, the Navajo rapidly produced error-free translations to and from English- a language at least as different from their own as Japanese- that were often of a highly technical and precise nature, and that concerned environments and technologies for which their language had no existing vocabulary. Baker called this contrast the "code-talker paradox" (Baker 2004:2).

[39] 65 of them, not counting closed class items, according to current versions of the theory, based on surveys of diverse languages (Goddard and Wierzbicka 2014). A reader may find this number to be surprisingly small, and indeed it is smaller than previous lists of words said to have counterparts in every language (e.g., Swadesh 1952; Immler 1991). It seems that as the list of languages surveyed to compile such lists grew, the lists themselves shrank. Indeed, even this list of 65 open class-words and some functional terms has been subject to doubt. For instance, von Fintel and Matthewson conducted a general survey that included Goddard and Wierzbicka's work and concluded that "We found no useful list of meanings which are universally lexicalized" (2008:190), while also questioning the assertion that these primes can be combined to express any proposition expressible by any language. Levinson finds that "[T]here are vanishingly few universal notions, if any, that every language denotes with a simple expression".

The NSM theory arrives at the same conclusion concerning translatability as Katz and the other authors discussed in this section, but the basis on which this claim is made is different. Other authors who advocated for some version of ***T*** mentioned the possibility of paraphrasing SL vocabulary with no TL equivalent into simpler terms (recall Jakobson's examples), but none made any claim regarding the completeness of existing lexical resources. Rather, lexical items, and especially open-class vocabulary, could simply be added to a language as needed, and therefore would not represent an impediment to translation. However, it would be wrong to regard Wierzbecka and Goddard as working in an entirely different intellectual framework than the others that have been discussed here. Rather, they can be placed firmly in the tradition that can be traced back to Sapir, by which all languages have the means to cover the same semantic space, a space defined by human psychology. For NSM theorists, the structure of the mind makes certain fundamental concepts, the primes, universal for all human populations[40].

In closing this section, it is notable that so many authors from otherwise widely varied perspectives on language came, independently, to conclusions so similar to Katz. This suggests that many see these results as following from commonly held theories of language, as well as of the relation of language to mind. Unfortunately, it is difficult to assess with perfect accuracy the exact relation of these authors to Katz, because they do not attempt any definition of what conditions must be met for a TL sentence to count as a translation of some SL sentence. Therefore, it is somewhat unclear how they would respond to counterexamples that target specific aspects of Katz's theories. Undoubtedly, the precision of Katz's definitions was a major

[40] A similar position is common among theorists working in the tradition of universal grammar, such as Li and Gleitman (2002), who argue that all humans share a number of innate concepts that are reflected in the vocabulary of spoken languages. Chomsky himself endorses this view: "Our intricate knowledge of what even the simplest words mean is acquired virtually without experience. At peak periods of language acquisition, children acquire about a word an hour, often on one presentation. The rich meaning of even the most elementary words must be substantially innate." (Chomsky 2017). This view of vocabulary as reflecting some innate concepts would seem to ensure some degree of translatability, although it does not necessarily entail something as strong as ***T***.

contribution to the field. We should turn now to his work, but first one more author should be discussed briefly.

§1.5 Wittgenstein and What Cannot be Said

After discussing these linguists and philosophers who endorse something like Katz's stance on effability and/or translatability, a reader may be expecting some mention of one major figure in the analytic tradition who seemed to very loudly endorse just the opposite conclusion about effability: Ludwig Wittgenstein. Discussion of Wittgenstein will be minimal, because the topic of this dissertation is translatability and Wittgenstein's main interest was in a specific aspect of effability[41], and also because of course any exegesis of his work is a notoriously difficult and complex matter for which space is lacking (the truly interested reader is referred to the vast secondary literature, e.g., Mounce 1981, Biletzki and Matat 2020). Still, since, as noted, some readers will be expecting him to make an appearance, he is included for the sake of completeness.

Wittgenstein's pronouncements on effability are, for the most part, too well known to bear repeating in full. But it is clear that he was skeptical of the possibility of speaking meaningfully of certain topics which are nevertheless among the most important areas of human interest. To recite just a few key passages:

> The limits of my language are the limits of my world. (1921:5.6)

[41] Aside, of course, from the cryptic "If a loin could speak, we would not understand him" (1953: 223). This quote fits better into the discussion of the possibility of radical untranslatability when faced with an alien language, a fascinating topic for which space is lacking in the present work.

(If this seems like it concerns translatability rather than effability, Wittgenstein at this point in the *Tractatus* was discussing human language in the abstract, rather than the capabilities of specific languages.)

> It is clear that ethics cannot be expressed…. (Ethics and aesthetics are one). (1921:6.421)
>
> Of the will as bearer of the ethical we cannot speak. (1921:6.422)
>
> Whereof one cannot speak, thereof one must be silent. (1921:7)
>
> For all I wanted to do…. was just to go beyond the world and that is to say beyond significant language. My whole tendency and I believe the tendency of all men who ever tried to write or talk Ethics or Religion was to run against the boundaries of language. This running against the walls of our cage is perfectly, absolutely hopeless. (1965: 11-12)

All this seems on the surface to be a fairly straightforward rejection of anything like E. However, it is actually far from clear that anything that Wittgenstein said was incompatible with Katz! Recall that Katz's theories were defined in terms of propositions, that is, entities which might be meaningfully labelled as true or false: the claim expressed by E is that every language has at least one sentence for every proposition. What Wittgenstein is claiming- once one peels back the cryptic flare- is that topics which cannot be the subjects of propositions cannot be the subjects of meaningful sentences, a conclusion which does not conflict with Katz.

It must be remembered that in the earlier part of his career, Wittgenstein was in the grip of a *picture theory* of meaning, by which linguistics acts have meaning because the structure of a sentence is isomorphic in some way to either some aspect of the world, or of a way that the world may have been (Mounce 1981). A corollary of this view is that meaningful language can only describe facts, or what would be facts if the world was different. Ethics, aesthetics, and

religion, on the other hand, were for Wittgenstein topics which resisted such description. For instance, listing all of the facts about a murder would still not touch on the essential wrongness of it (Wittgenstein 1965:6), and therefore nothing can meaningfully be uttered on this topic. Truths about ethical matters can only be, on Wittgenstein's view, glimpsed by some sort of mystic insight, rather than accessed through ordinary mental processes which involved the grasping of propositions. Thus (1956:7)

> Our words as we use them in science, are vessels capable only of containing meaning and sense…Ethics, if it is anything, is supernatural and our words will only express facts; as a teacup will only hold a teacup full of water and if I were to pour out a gallon over it.

This is not to say that Katz would have endorsed anything like Wittgenstein's conclusions about ethics or aesthetics, and he certainly did not share the same theory of meaning. But nothing in Katz's views on effability, to be discussed next, rules out that there may be mental entities- emotions, experiences, reactions to religious or aesthetic experience, - that cannot be expressed by language. Indeed, his particular formulation of *E* invites this interpretation: mental activity that does not consist of propositions was not his concern. It is very doubtful that Katz would have drawn the exact boundary in the same way as the early Wittgenstein, as he did not share the particular commitment to the picture theory or conception of ethics that would cause "murder is wrong" to be outside the range of meaningful language. Perhaps more consistent with Katz would be James' (1958) description of the *ineffable* aspects of religious experience as mental states that are more feeling than intellect. But the detour to consider Wittgenstein does serve to highlight that Katz's view was not simply that anything at all can be described, and it is compatible with the idea that certain experiences may remain ineffable simply because they cannot be the subject of any well-defined propositions.

§2 Katz and Effability

The Principle of Effability, ***E***, defined in §0, played a major role in Katz's views on language, mind and translation, and could be the topic of a dissertation on its own. However, since our subject is translation, I will discuss effability only in so far as it is illuminating for that concern. The first subsection below will cover some necessary background, especially Katz's association of propositions with sentence meanings and his argument to that effect, which is important for what follows. The next subsection will cover Katz's (rather sparse) positive arguments that ***E*** obtains, as well as the link between ***E*** and ***T***. The third subsection will discuss Katz's proposal that effability is the distinguishing characteristic of human languages. The section will close with a brief discussion of weaker principles of effability, and the possibility of defending ***T*** without endorsing ***E***.

§2.1 Sentences, Propositions, and other Clarifications

Before considering why Katz would postulate such a strong principle, we should first attempt to clarify exactly what was intended, beginning with his conception of propositions.

Katz was heavily influenced by the Fregean concept of language mentioned in §1.3, by which human language provides a detectable form to Thoughts, or propositions, which are the sense, or meaning of sentences.

> So I can say: thoughts are senses of sentences, without wishing to assert that the sense of every sentence is a thought. The thought, in itself imperceptible by the senses, gets clothed in the perceptible garb of a sentence, and thereby we are enabled to grasp it. We say a sentence *expresses* a thought. (Frege 1919:58)

Katz endorsed the view that, *contra* Quine, "Propositions exist…and the question of what are the identity conditions for propositions is sound" (1978:193). Katz does not attempt to provide anything in the way of support for the first part of this claim, simply noting instead that propositions are "legitimate objects of theoretical speculation" and since semantic theory in general is in its infancy, we should remember that

> [Q]uestions of existence are less important at the outset of theory construction, due to the fact that a theory has to be obtained first and then, as a consequence of the existence of this theory, we discover in what sense the objects referred to in the theory can be said to exist… (1978:204)

In other words, the first step is to construct a successful theory, and then to critically examine the ontology required by that theory. Since Katz's semantic theory required propositions, we should first finish constructing the theory and integrating it into linguistic science, and if this can be done successfully we should then ask questions about what propositions are, exactly. Because our primary interest here is not ontology, I will not go any further into this part of Katz's position, except to note that it seems reminiscent of Quine's (1948) insistence that we look to our best scientific theories to determine what there is. The exact nature of propositions is left undecided; Katz suggests that there are at least three possibilities: a Fregean abstract entity, a "mentalistic construction" or a brain state (1978:203). He does note elsewhere that whatever propositions are exactly, they are the entities studied by logicians.

What is rather better developed is the second part of the claim, that the proper identity conditions for propositions is a "sound" question. This is because, as for Frege, propositions are identical to the *senses* (i.e., meanings) of sentences, allowing the question to be investigated

using the best available theories of linguistic science. Katz does address in more detail the question of why we should take propositions to be identical to the sense of sentences (1978:201):

> A proposition is identified with the sense of a sentence in exactly the manner that physical science identifies water with H_2O. The justification…must proceed in the same way that arguments for theoretical justification in the other sciences proceed…There is as close correspondence between facts about propositions and facts about senses of sentences as there is between facts about water and facts about H_20.

To support this assertion of identity, Katz submitted that the role of propositions in the study of formal logic is identical to the role played by the sense of sentences in the linguistic study of natural language semantics. This position is consistent with Katz's broad view of logic as involving all of language, c.f., Quine, and others who view the intersection of logic and language as confined to the analysis of a restricted set of connectives (Katz, 1972; Quine 1970). Analyticity and entailment are then logical properties of natural language sentences in virtue of "structural relations internal to the senses of sentences" (1981:5), that is, the logical properties of sentences are inherited from the features of the propositions that are their senses. Even non-assertive sentences such as commands and questions have a proposition as their sense (Katz 1977,1978). On this view, logic and semantics are virtually the same enterprise.

Defending this claim, Katz notes that the analysis that a linguist would provide about the sense of a sentence will correspond to that a logician would provide about the proposition it expresses. A NL sentence which a logician would describe as expressing no proposition a linguist would describe as being senseless (e.g., "Charles drinks procrastination" (Katz 1978:202), while in contrast a sentence that does express a logical proposition would be

identified as meaningful[42]. Two sentences which a logician would identify as interchangeable without altering the structure of an argument a linguist would describe as synonymous or having the same sense ("Charles drinks prune juice"/ "Prune juice is drunk by Charles" (Katz 1978:202)). Finally, a single sentence expressing two or more propositions is ambiguous to the logician, in that its role in an argument is unclear, and semantically ambiguous to the linguist.

Katz argued that, in the absence of an alternative explanation for this correspondence, the reasonable step is to identify the sense of a sentence with the proposition that it expresses. This simplifies the theory itself, because it removes the need to explain the close correspondence just discussed, and it is ontologically parsimonious, since if two concepts are playing the same theoretical role there is no need to multiply entities. Because the identification of propositions with the senses of sentences allows well-defined and determinate answers to questions about synonymy, this move is an important first step in two projects that Katz was engaged in. First, it offers the beginning of an answer to Quinean indeterminacy. Second, it allows ***T*** to be investigated in an orderly way, which provides a means for putting ***E*** to an empirical test (of course, this aspect of the discussion will be developed at much greater length in what follows).

Katz identified the set of all propositions (and therefore of all sentence meanings) as "all the thoughts that it is in principle possible to think" (1978:219)[43]. This position is a consistent

[42] One might question whether there is any syntactically well-formed sentence so irregular that it cannot receive some sort of interpretation. For instance, to take Katz's example, "Charles drinks procrastination" could be used to convey that Charles is lazy, or prefers drinking to working, or perhaps the (presumably false) assertion that Charles is literally imbibing procrastination. This question may be independently interesting but is irrelevant to Katz's theories, as any such use of an apparently meaningless sentence will rely heavily on context and knowledge shared by both speaker and audience. The sense(s) of a sentence are, for Katz, the proposition that it expresses in the *null-context*, that is, its content when no special circumstances obtain that may trigger a reading not typically available (Katz 1977). Of course, whether the idea of the "meaning" of a sentence devoid of all context is a fully coherent one is a question that might be debated, but which is too large to address here.

[43] Katz implies that this is intended to cover thoughts not only thinkable by human beings but thinkable at all. While Katz does not state this explicitly, this can be drawn as a direct consequence of his claim that hypothetical creatures with more advanced cognitive capabilities could use an NL like English or French to express propositions

extension of Katz's general conception of NL semantics. In *Semantic Theory* (1972), as well as in earlier work in collaboration with Fodor (1963), Katz undertook a project which involved individuating lexical items in terms of the presence or absence of certain standard semantic features; by compositionality, these features would then define sentence meaning. The idea was based on an analogy with phonetics, where the entire space of sounds possible in spoken language are definable in terms of a finite set of features, with the particular phonemes defined by the presence or absence of those features, e.g., "+/- nasal"[44]. Likewise, on Katz's theory, any part of the space of possible concepts, or thoughts, could be covered by some combination of semantic features (again see Chomsky 1998 for discussion).

The similarity to Sapir is evident; this is essentially Sapir's idea of a natural language as a complete coordinate system with more of the details filled in (Sapir 1924, see discussion in §1.1 of the present chapter). Sapir was somewhat more guarded in his conclusion, endorsing only ***T***, while Katz endorsed the stronger ***E***; this would indicate that that Sapir regarded the semantic field as consisting of anything expressible by an NL, while for Katz it consisted of any proposition (anything thinkable). Of course, the analogy with phonetics breaks down somewhat in that no NL contains the entire range of sounds that can be articulated by the human vocal system, let alone that could be theoretically produced and incorporated into a language. But as

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that are beyond human grasp (1978: 217-218). Despite this, the applicability of ***E*** to more-than-human thinkers seems to simply fall out of the picture when Katz moves on to motivating the principle. For instance, he argues that effability should obtain because of a natural fit between human thought and communication. Obviously, such arguments do not support a principle of effability that would define thoughts in terms of what was thinkable at all, including by agents with superhuman cognitive abilities.

[44] Chomsky and Halle 1968; Jakobson and Halle 1971; see Chomsky 1998 for a discussion of the relation of Katz's approach to semantic theory to Jakobson's work in phonetics. For instance, Chomsky and Halle, whose work drew on Jakobson's, describe the English sound "i" as: + for syllabic, high and tense, - for consonantal, back, low, anterior, coronal and round (most of these refer to the tongue positions used to produce the vowel). In Katz's system, the English verb *chase* is represented by the semantic features: activity, physical, movement, speed (fast), following (y), purpose (to catch (y)) (Katz 1972:101). Note that in Katz's system for semantic representations only the + features are listed, presumably the - features would be far too many to list.

both Sapir and Katz noted, the vocabulary of a language can always be expanded, thus adding new semantic features to cover any deficiencies.

Katz was careful to differentiate ***E*** from a similar proposal with which it might be easily confused, and which he termed "expressibility", (Katz 1978:217), italics added)[45]:

> **(E') Principle of Expressibility**: Each *thought* can be expressed by some *utterance* of a natural language.

Here a *thought* is to be understood as a mental entity standing in a token-type relation to propositions[46]. While ***E*** is a principle that concerns languages themselves, ***E'*** concerns the speakers of those languages, and so is a "psychological principle" about their performance (Katz 1972:217). Katz asserts that ***E'*** would hold for an idealized speaker under idealized conditions, but of course no such principle obtains in practice due to real world limitations on performance. A speaker may be unable to process thoughts that are too complex or extensive into propositions, analogous to the way in which speakers typically cannot produce or understand sentences containing multiple center embeddings, or excessively long sentences (Katz 1978). This is not evidence against ***E***, which was a proposal about the resources contained in NLs, rather than the capabilities of their speakers.

§2.2 Katz's Case for *E*

Katz offered surprisingly little explicit defense of ***E***, despite its obvious importance to his theories; indeed, it is treated more as an observed characteristic that requires explanation rather than argument. He acknowledged that ***E*** represents the strongest possible position on the

[45] Not to be confused with Searle's principle of the same name (§1.3), although there is a certain resemblance between the two claims.

[46] Note that the use of *thought* here is much different from the Fregean *Thought*, which was what Katz called a *proposition*.

expressive power of NLs but maintained this to be a positive feature of the theory, arguing that postulating anything weaker without supporting evidence would merely be an arbitrary stipulation (1978:224). Katz suggested that such evidence could take the form of failures of ***T***, as this would indicate that at least one language was unable to express some clearly identifiable thought. Although the matter is highly controversial, to say the least, Katz denied that any counterexamples to ***T*** had been identified (discussion of this point will constitute the bulk of the remainder of this chapter and the next).

As positive support for ***E***, Katz proposed that the principle is made plausible by reflection on everyday language use (Katz 1972:19)

> I take it as some empirical evidence for the claim that natural languages are effable that speakers almost always find appropriate sentences to express their thoughts, that difficulties in thinking of a sentence are invariably regarded as a failing on the part of the speaker rather than of the language, and that there is nothing to indicate that there is any type of information that cannot be communicated by the sentences of a natural language.

This passage is somewhat remarkable for the incautious claims it contains. Certainly not everyone would ruminate on their own experience as a language user and agree with the first two claims, that speakers almost invariably find the right words or that difficulties can always be assigned to the speaker, rather than the language itself. Keenan would raise these very points later when commenting on this passage (Keenan 1978:159 fn 3)

> But the status of this 'empirical' support is equivocal. We have all experienced difficulties in trying to express our thoughts…and often our thoughts remain very imperfectly expressed. (Recall all the papers we started to write but never finished). Who

> is to say that the difficulty lies in our poor ingenuity in using the language rather than in the inherent limitations of the language itself (Katz offers no empirical support for this latter claim)?

Keenan then went on to note that there is no reason to assume that NLs do not have limits in the same manner as formal languages, where, for instance, the validity of arguments that rely critically on quantifiers cannot be captured in propositional logic (see §1, Chapter 1). Keenan ends his discussion of Katz's "empirical evidence" with a poem by the ancient Chinese poet T'ao Ch'ien which concludes:

> In these things there lies a deep meaning;
> Yet when we would express it, words suddenly fail us.

Katz also provided a more conceptual argument, based on the idea that there should be a close fit between the capabilities of the human mind and the human ability to communicate. This link was briefly postulated in *Semantic Theory*, where effability was first proposed (1972:23)

> [I]t seems natural that the creative intellectual capacities of human beings should have an instrument of communication that is suited to them. Biologically, then, the effability of human languages fits in well with the various degrees of ineffability found in animals with a more restricted intellectual make up.

Although this appears to be a bit of a non-sequitur, presumably the idea is something similar to that expounded in Frege's discussion of the resemblance between the structure of sentences and thoughts (§1.3). On this view, language is a means of externalizing or communicating thought (recall Frege's comment that sentences are the images of thoughts) and therefore anything thinkable should be sayable. Non-human animals would have somewhat more limited means of communication because their thoughts are correspondingly less complex. Of

course, a number of issues might be flagged here. Language might be well suited to communicating thought without being a perfect instrument for the task, and in any case the status of language as primarily a means of communication is controversial (see, for example, Chomsky 2014).

This argument was taken up again later, where there was an attempt to link it to the idea of language universals associated with Chomsky's program. While Chomsky had concentrated on syntax, Katz intended to expand this program to semantics. In passages such as the following, he proposed that the semantic universals present in each NL are adequate to cover all of semantic space (1978:218, the odd use of the French for "program" is from the original, and was standard for Katz):

> [W]e explain the fact that effability is characteristic of natural languages as a species specific biological trait, originating in a genetic disposition to programme language learning in accord with a very narrow set of linguistic universals. On the semantic side, these universals determine a conceptual space in which every proposition can be represented by some set of semantic primitives and some principle of semantic combination.

However, that the semantic universals in fact determine a conceptual space containing every proposition is never argued for. In fact, Katz notes that at the present state of semantic theory, there is only a "sketch of an explanation" for *why* the semantic universals are adequate to cover all of conceptual space! (1978:219) Therefore, in common with other writers who proposed something resembling ***E***, Katz provides little argument for such a sweeping claim.

Katz did propose that ***E*** would explain two aspects of language. One is the uniqueness of human language; this will be discussed in the next subsection. The other is that all natural

languages are (at least according to Katz) intertranslatable, in other words, ***T***. It was defense of ***T***, rather than ***E***, which would constitute by far the bulk of Katz's writings on this subject. This may seem somewhat backwards, for two reasons. First, ***E*** was Katz's basis for proposing ***T*** in the first place. Second, since ***E*** entails ***T*** but not the inverse, it would be perfectly possible for ***T*** to obtain but for ***E*** to be false, which Katz acknowledged (1972,1978). It seems that Katz's reasoning was that any proposed limit on effability in the absence of evidence would be arbitrary, and the only manner for such evidence to be identified would be through a failure of ***T***[47] . Thus the concentration on discussing ***T***, and why Katz felt justified in asserting his Principle of Effability without in-depth argument.

We should close this subsection by mentioning an objection, one which may have already occurred to the reader and which Katz anticipated. The acceptable sentences that might be generated by the syntax of any language are countably infinite, but there are uncountably many facts- for instance, that every real number is less than some other real number. In response, Katz reiterated that on his theory propositions are identical to the sense of sentences, not to facts, and that ***E*** required a sentence for every proposition, not for every fact (1978:225). If correct, this would ensure that the set of all propositions is of the same cardinality as the set of sentences belonging to an NL[48].

[47] This line of thinking seems to be in common between Katz and his critics, who overwhelmingly attack ***E*** not directly, but rather through ***T***. Whether investigating translation might be the only method for investigating effability might be fairly doubted, but it is certainly a readily available method and an area where existing empirical data might be put to use.

[48] This might seem to require a great deal more discussion than Katz's brief mention. If the set of propositions does not include all of the facts about the real numbers, that would seem to imply- on Katz's scheme- that some facts about real numbers being larger than some other reals would be unthinkable, even in principle, which seems to be an odd result.

§2.3 *E* and the Uniqueness of Human Language

As mentioned in the previous subsection, Katz regarded effability as the key factor differentiating NLs from artificial languages such as systems of symbolic logic, on the one hand, and various systems of animal communication on the other.

Looking at animal communication, Katz noted that there are important differences in expressive power between human systems of speech and signing as opposed to phenomena such as the "dance of the bees" or even the systems of signaling taught to great apes in captivity (Katz 1978). Addressing arguments that the key differences are syntactical (e.g., Chomsky 1966; Fodor, Bever and Garrett 1975), Katz responded that for a communication system to have a syntax, and the capability to generate an infinity of novel sequences through an iterative syntactic mechanism, are necessary but not sufficient conditions for that system to be equivalent to a human NL. In support of this point, he cited evidence that bees are able to generate infinite novel "sentences" by varying and iterating their dances (Lindauer 1961). Yet, in contrast to the range of propositions that can be conveyed by NLs, the bees are limited to communicating information about available food sources.

Katz also discusses captive chimpanzees, whose sign language abilities have been extensively studied. He observed that they had been reported to master conjunction (Premack 1971), but denied that even the ability to apply this rule an unlimited number of times would allow an infinite generative capability: "…with just this rule and a finite vocabulary of names…output is restricted, in principle, to a finite number of sentences" (Katz 1978:214). This point is not entirely clear, since of course humans have a finite vocabulary and rely on a finite set

of syntactic operations to form compound sentences[49]. In any case, this is inessential to the main argument, since he concedes that this limitation could in principle be overcome by easily imaginable extensions. For instance, the ape could be taught to iterate the name of a type of fruit to indicate how many pieces she wants, which would allow for an infinite number of sentences (e.g., "want apple", "want apple, apple" and so on). The resulting language would still not have anything resembling the expressive power of an NL (Katz 1978:214). In other words, we would not be impressed by a simian sign language that could only be used discuss a few basic needs and desires of the apes, even if it had a complex syntax[50].

Katz suggested that considerations such as these point to "failures in the attempt to find the uniqueness of natural language at the syntactic level" and as a consequence it must be that (Katz 1978:215 italics in original)

> [T]he uniqueness of natural languages has to do with its *semantic* as well as its syntactic and phonological levels…effability, the thesis of the completeness of the semantic level of language and the power of the syntactic and phonological levels to express the objects at the semantic level, has considerable initial plausibility.

Non-human systems of communication have the ability to express propositions only in a sharply limited range, for example, directions to food sources for bees and conjunctions about a small set of nouns in the case of the sign languages of captive apes. Things are even more clear when

[49] Possibly, Katz was appealing to the principle of idempotence, $P \Leftrightarrow (P \wedge P) \Leftrightarrow (P \wedge P \wedge P)$ …. Given that the chimpanzee has only a limited number of signs and can only form compound sentences from basic ones by conjunction, she would have to be merely repeating herself at some point.

[50] It might be noted that in this thought experiment, the hypothetical ape sign language has an ability to generate an infinity of sentences, as do NLs, but is accomplishing this by different means. The ape language has an open-ended ability to add additional elements to the end of a sentence, while NLs might achieve an infinity of sentences by this means but also by recursively embedding phrases inside of other phrases, producing nested structures of unlimited depth (see, e.g., Lasnik 2000). But Katz's point still stands: even if the ape language had nested recursion (whatever this would amount to in this case, exactly) we might regard this as a curiosity, but we would still be hesitant to regard it as equivalent to an NL, given its sharply limited expressive power.

considering artificial formal languages such as propositional logic or FOL, as their recursive structure allows for the unbounded generation of formula, yet these languages have very limited expressive power.

A positive argument is also provided, albeit one that rests heavily on intuition. Katz calls attention to the fact that we typically judge competence in a foreign language by the range of things a speaker is able to express in that language. A completely competent speaker of a language, he concludes, is one who can express "*anything* in the foreign language" (Katz 1978:215, italics mine). Katz then asked us to imagine ourselves faced with a novel sort of bilingual (his specific example was a talking porpoise). How would we assess whether this is a genuine bilingual- both fluent in English and a native speaker of something else analogous to a NL- as opposed to a previously languageless creature who had somehow acquired competence in English? Katz maintained that settling this dispute must involve finding a way to test whether any sentence of English, expressing any proposition, that we ask it to translate is in fact accurately understood and then rendered into its own way of communicating (Katz 1978). The idea that Katz is appealing to is that even if the creature displays no difficulties in speaking English, if it has limitations in rendering English sentences into its own system of communication, then whatever we may say about that system, it is not some alien analog of an NL.

The intuition here is fairly clear. We wouldn't judge an English speaking bee to be bilingual in the sense of a Frenchman who has learned English, because the only English sentences the bee could translate back into her native idiom would be those giving distance and direction to pollen. But Katz's point does not hold up well on closer inspection. If actually faced with the sort of situation that Katz imagines, the test he is proposing would be far from decisive.

Asking the hypothetical talking porpoise whether he can translate English sentences into porpoise-speak and resting the case there is to invite interference from a host of non-linguistic factors, for instance, the ability of the particular specimen to translate under laboratory conditions[51]. A defender might counter that this is irrelevant to the thought experiment, which is concerned with the capabilities of the porpoise's native method of communication and not with his individual performance as a translator. Still, we might feel that Katz was simply begging the question here by restating part of what he was trying to establish, i.e., that anything equivalent to a human NL would be identifiable by its expressive power.

Actually, there is a much deeper problem with Katz's thought experiment: as an argument that the defining characteristic of human languages is the "completeness of the semantic level", or ***E***, it is blatantly circular! Unless we assume that English can be used to express any proposition, all that is being tested here is whether English and the porpoise language are translatable. It may serve, like the preceding thought experiment with the signing ape, to prime the intuition that we would expect anything equivalent to a human language to have a certain minimal expressive power, but of course this is different from making the case that human languages are defined by full effability. What considering this case does draw attention to, however, is that effability and translatability are separate questions that can easily come apart[52].

[51] This is a problem that actually permeates the study of both effability and translatability, since similar non-linguistic factors complicate the analysis of data from human subjects. I will return to this point later in the chapter. The steps that linguists take to control for these considerations are discussed by Deal (2014) and Matthewson (2013b).

[52] We might ask what we would make of an apparent counterexample to the intuition that all human languages must exhibit some minimal level of expressibility, e.g., if we encountered an isolated language that could only express the immediate needs and wants of the speakers (actually, Pirahã is allegedly very nearly at this level, according to Everett 2005). The first thing that we would want to know is whether the language has a greater expressive capability that is, for whatever reason, currently latent in the behavior of speakers (because of cultural

§2.4 *T* without *E*

Setting aside the issues of whether Katz's principle is the proper criterion to demarcate human language, ***E*** is a very strong thesis. Weaker versions of ***E*** are possible, for instance Sapir's assertion that all NLs can express anything that can be expressed by language. A counterexample would be impossible to find within the boundaries of a single language, but Sapir's claim might be falsified by a failure of ***T***, or by the discovery of a non-human language that resisted translation into some human language. Then, absent the discovery of alien languages, Sapir's version of effability essentially amounts to ***T***.

Another possibility is that any proposition can be expressed by some NL or the other, leaving it open that some languages contain expressive gaps while the linguistic competence of humanity, taken as a whole, does not. On this theory, there may be no single language that is fully effable; instead, each language can express the propositions and aspects of reality salient to its speakers with the combined semantic resources of all languages covering the entire semantic field[53]. Katz never explicitly considered such versions of ***E***, that would allow for some variation in effability between NLs, but we may extrapolate from his published work on semantics and linguistics in general why he would regard them as flawed. For Katz, issues of effability and

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taboos, for instance, something like this has been suggested to be the case for Pirahã, see discussion in Chapter III, §6). If this is not the case, if the language is in fact inherently limited in some way, we may well judge it to be a system of communication that is not on par with currently known NLs and so not really a *human language*, as much because of whatever factor (e.g., some particular syntactical feature) that is limiting its ability to formulate new sentences to express further propositions as because of the resulting semantic limitations. But note that this decision would be *stipulative*, and not an application of any antecedent definition of *human language* that requires a minimum level of expressive power.

This discussion of latent expressive capabilities is an important theme that we will return to in the context of translatability, in §5, §6.1 and again in Chapter IV, §2.

[53] Something similar is proposed by Li and Gleitman (2002), who suggested that an NL must have the means available to fulfill the needs and interests of the community that speaks it, but not necessarily any more than this. So, at any given state of its history, an NL will contain expressive gaps, but Li and Gleitman argue that languages have an ability to develop and express new ideas, so that their position on effability ultimately comes out the same as that of Katz and Jakobson.

translatability were closely tied to the hypothesis of generative grammar and a universal language faculty underlying language acquisition and use, part of the biological endowment of all normally constituted humans[54]. He reasoned that if human competence as languages users is the result of having the same biology, then all humans will have the same expressive capabilities across linguistic communities. For instance, he states that (1978:219)

> If it is a biological fact about the human species that underlying its rational capacities is a conceptual framework with the potential to generate the set of propositions…then each human language community has the same stock of possible thoughts.

This argument is noteworthy for two reasons. First, this renders inadmissible any weakened version of ***E*** which would leave open the possibility of NLs possessing different expressive capabilities. Second, the theoretical commitment to a biological basis for both the human conceptual framework and human language that motivated Katz's views on effability might also motivate ***T*** completely independently of any position on whether NLs can capture all propositions. It might be argued that if the same mechanisms underly the generation and acquisition of language in all human linguistic communities, then NLs that those communities acquire will be equal in expressive power. This is, of course, an entirely separate question from that of how extensive that expressive power is, and no hypothesis need be framed on that account. Strangely, Katz himself seems to have never considered this line of reasoning. But since this provides plausible independent motivation for ***T***, the principle of effability will not be considered any further in this dissertation. We should now turn to translatability.

[54] At least during the period during which he was involved in the debate on translatability, after he turned to full-blown Platonism about languages (Katz 1981) the relation of Katz's work to universal grammar becomes much less clear.

§3 Translatability

It should be kept in mind as we discuss in detail Katz's principle of translatability that it was, like $\boldsymbol{E}$, a very strong theory, and counterexamples that are telling against his formulation do not necessarily count as such against other possible versions. Katz's definition of his principle was given in §0, it is provided here once again for convenience:

> **Principle of Translatability ($\boldsymbol{T}$):** "For any pair of natural languages L_i and L_j and for any sentence S in L_i, and for any sense σ of S, there is at least one sentence S' in L_j such that σ is a sense of S'."

The link between effability and translatability is evident, but it can be spelled out more rigorously as follows. Suppose a proposition P is expressed in language L_i by a sentence S- $\boldsymbol{E}$ guarantees that there must be some such sentence for each P. Again by $\boldsymbol{E}$, in any $L_j, i \neq j,$ there must be some S' that also expresses P. Since S and S' express the same proposition, they also have the same sense, thus $\boldsymbol{T}$ obtains. This makes $\boldsymbol{E}$ an empirically testable hypothesis; if a counterexample to $\boldsymbol{T}$ can be identified, then $\boldsymbol{E}$ would fall by modus tollens (Katz 1972,1974,1976).

Critics have generally followed Katz in regarding $\boldsymbol{T}$ and thus $\boldsymbol{E}$ as empirically falsifiable, and numerous proposed examples have been drawn from the work of field linguists (e.g., Deal 2011; Keenan 1974,1976,1978; Matthewson 2006, all to be discussed in the next chapter). Unfortunately, the interpretation of the available evidence is far from straightforward. Unlike the situation with formal languages discussed in the previous chapter, it is very difficult to conclusively demonstrate that a certain sentence absolutely cannot be translated into a given TL, even if a standard for acceptable translation is agreed on. The sentences of any NL are infinite,

and while of course well-studied formal languages are also infinite there are also proof techniques that can be used with formal languages which generally cannot be applied to NLs. Not only because of this considerations, but because of myriad performance issues that can only with difficulty be kept separate from the capabilities of the language itself, the judgement of a field linguist's bilingual informants that no equivalent to an SL sentence exists in the TL will always be subject to a degree of doubt. A translation may exist, perhaps a very long or unnatural one, that has simply not occurred to anyone. Evidence can be drawn from the syntax of the TL that it lacks the means to form certain constructions needed to express the exact meaning of the SL sentence, but the interpretation of such evidence is often contentious. In what follows, we will frequently have cause to return to these considerations.

It follows from Katz's views on sentence meaning that a major goal of semantic theory is to give identity criteria for propositions, that is, for specifying of propositions x and y whether $x = y$ or $x \neq y$ (Katz 1972,1978). If propositions are the same things as sentence meanings, Katz held that identifying such criteria would allow firm answers on questions of analyticity, natural language entailment, synonymy, and therefore translation, which is after all merely a special case of synonymy. At the same time, this sameness could be exploited to allow the linguistic tools for the study of sentences to be brought to bear along with methods from formal logic used to identify the properties of propositions.

To set the identity conditions for the senses of sentences, Katz stated that the semantic theory must specify for each meaning, or sense,

> …a set of properties and relations ***K*** such that "x is the same sense as y" can be defined in terms of x and y having ***K***-properties and ***K***-relations in common. That is, ***K*** is the set

> of properties and relations such that the sense of a sentence S_i is the same as that of another S_j just in case, for any property in $\boldsymbol{K}$, S_i has it if, and only if S_j has it, and for any relation in $\boldsymbol{K}$, S_i bears it to $S_1, \ldots, S_n$ if, and only if S_j bears it to $S_1, \ldots, S_n$. (Katz 1978: 205).

$\boldsymbol{K}$ was intended to include only semantic properties. Other properties that might belong to a sentence more generally, rather than specifically to its sense, or meaning, are not included. Thus, syntactical and phonological features, length, and co-occurrence patterns are outside of $\boldsymbol{K}$[55]. The members of $\boldsymbol{K}$ are synonymy, anomaly, redundancy, analyticity, entailment and "so on" (Katz 1978:205). The first five items on the list are what Katz regarded as the clear-cut cases, while the "so on" at the end was intended to cover properties and relations that might be added as semantic theory expanded.

Part of Katz's general project was to establish a scientific semantic theory, so that a semantic representation would be available for each sentence, analogous to its syntactical description in terms of phrase markers (Katz 1972). Such a representation would be defined in terms of the properties of $\boldsymbol{K}$. Any sentence with more than one sense would have multiple semantic representations, one for each sense it might express. If two sentences have a semantic representation in common, then they are considered to be *partially synonymous* (Katz 1978:215). It is this relation which is of interest in what follows, so from this point it will usually be referred

[55] The explicit exclusion of co-occurrence patterns, that is whether or not one word or phrase is frequently used in the same linguistic environment as another, as verified by corpus studies, is noteworthy. In J.C. Catford's *A Linguistic Theory of Translation* (1969), a work that was and remains extremely influential in the field of translation studies, co-occurrence is the essential factor in determining synonymy, and so translation. There was a fundamental difference in the notion of meaning employed by Katz and Catford. For Catford, meaning was a question of the function of a linguistic unit in a system, or economy; for Katz it was a question of the identity of propositions. On Katz's view, then, patterns of use demonstrated by speakers of the language were of little importance.

to as simply *synonymous*. Katz distinguishes this from *full synonymy*, the relation that obtains between two sentences that have all and only the same semantic representations[56].

The property of a sentence being a *translation* of another is just a special case of partial synonymy, one that happens to obtain between the sentences of different NLs (clearly a theory of universal translatability that required full synonymy as a condition on successful translation would be a nonstarter, as Katz acknowledged). Most of the subsequent controversy surrounding T has been generated by a single member of K: entailment. If a sentence A in the SL entails another sentence B of the SL, then any TL sentence that would count as a translation of A must entail the TL sentence that translates B.

As discussed in the previous chapter, it certainly seems intuitively obvious that we want many entailments to be preserved under translation. Even without any knowledge of the TL, we would be inclined to reject a purported translation of "Albert is a black cat" if we were informed that the resulting TL sentence did not entail the TL equivalent of "Albert is a cat". But it is dubious whether a proper translation of "Albert is a black cat" should entail the TL equivalent of "Albert is a cat and classical propositional logic is complete". The completeness of propositional logic is necessary, and so always true in any possible circumstance, and so entailed by "Albert is

[56] The reader may be puzzled by the fact that for two sentences to be synonymous, they must share a sense, but the identity criteria for senses is defined by the set K, which includes synonymy. Indeed, this appears to be a moment of carelessness on Katz's part. Including synonymy in K would not necessarily be viciously circular, but it would require that two synonymous sentences be synonymous with all and only the same sentences. This would make synonymy transitive, which makes little sense if partial synonymy is the relation of interest. Suppose that a sentence A is ambiguous, having as senses the propositions P_1 and P_2 and the sentence B is ambiguous between P_2 and P_3, then A and B should be (partially) synonymous, but only B should be synonymous to a further sentence C that has one reading, P_3. To read Katz (very) charitably, it is possible that he was using *synonymy* to refer to two different relations, as the relation between two sentences that share a sense, and as the identity relation between senses (although in this case it would be redundant to place this relation, as a property of senses, in K, since it would automatically obtain between two senses when the other members of K were identical). A more sensible resolution would be to simply remove synonymy from K, which would have no repercussions for the rest of Katz's theory.

cat". But surely we do not want whether or not "Albert is black cat" is translatable into a given TL to be dependent on whether that language also has the resources to discuss abstract logical theory[57].

In fact, Katz's definition of entailment avoided these issues, as he drew a division between *logical entailments* and *semantic entailments*. Logical entailments are a consequence of the laws of logical inference, while semantic entailment is informally explained as follows[58] (Katz 1972:184, italics in original):

> [T]his concept can be characterized as a relation between one proposition and another on the basis of which one follows logically from another but *not* by virtue of any law of logic. That is, there are no steps from the premises to the conclusion and no reason to invoke a law of logic. The validity of such arguments depends on the logical form of the conclusion being part of the logical form of the premises…. Their justification…rests on meaning relations…

Note however, that these labels might be somewhat misleading. For Katz logic and language are coextensive, and so the division between these two classes of entailments is not meant to separate two fundamentally different types of relations, but rather to identify the source of inferential warrant. He compares this to the way that we can separate out logical inferences due to the characteristics of connectives (and, or…) from those due to quantifiers.

[57] Of course, a proponent of T, including Katz, would insist that all languages do, in fact, have such resources. But this is a different matter than making this a condition on successful translation.

[58] A more technical definition is also given, but is not needed here; essentially what it amounts to is the claim that sentence A entails B if the semantic markers in the semantic representation of B are a subset of those in the semantic representation of A. The interested reader is referred to Katz 1972, page 188-189.

It follows from Katz's definition that "Albert is a black cat" semantically entails "Albert is cat", but not "Albert is a cat and propositional logic is complete", as the former is (on Katz's account, in any case) an immediate inference based on meaning and requiring no intermediate steps, while the latter requires a long chain of complex reasoning, and would therefore be considered a logical entailment. As semantic entailment is the relation contained in K, the worry concerning trivial entailments is blocked[59]. From this point forward, unless specifically stated otherwise, *entailment* is to be understood in Katz's sense of semantic entailment.

However, a new worry does emerge. Katz explicitly allows for two sorts of entailments, in which "the entailment comes off the presupposition and assertion of the entailing proposition" ("A spinster assassinated a bachelor" ⟹ "A woman killed a man") and where "the entailment comes of the presupposition [only]" ("The killer's disposed of John's corpse"⟹ "John is dead") (Katz 1972:189). This leads directly into what is the most widely discussed sort of objection to

[59] This is not to say that issues do not remain, or that new ones are not created by this definition. One that the reader may have noticed is that Katz's concept of semantic entailment is basically that of an inference which must be true by virtue of meaning, in other words, what would normally be called an *analytic truth* (Katz's own definition of an *analytic proposition* is just the special case of entailment involving a single proposition whose presuppositions include the truth of the analytic proposition itself). Thus, some of the issues that are often noted with analyticity are also of concern in this context. For example, it seem reasonable that we would want any translation of "Albert is a black cat" to entail the TL equivalent of "Albert is a cat", but matters become considerably less clear with "Albert is a mammal", "Albert is an animal", "Albert is colored" and so on. It can reasonably be extrapolated, both from Katz's general semantic theory and the examples that he provides of semantic entailment ("Some bachelors are kings" ⟹ "Some males are monarchs", 1972:189) that all of these would be considered entailments of "Albert is a black cat" on his theory. Since a TL sentence must have identical semantic representation to a SL sentence in order to be considered a translation, it follows that these same entailments must hold between the equivalent TL sentences as well. This makes some sense on Katz's overall theory, since analyticity and entailment were held to be properties of propositions, and therefore at bottom metaphysical rather than linguistic in nature, such that we would expect these to remain constant between languages. But this seems like a very strict requirement on translation, one that might be impossible to meet for some pairs of languages. For example, we might easily imagine a language belonging to a culture in which whales are regarded as fish, so that their equivalent of "Albert is a whale" semantically entails "Albert is a fish", this may even be a property of the language itself, e.g., the nearest equivalent to *whale* may be literally *big fish*. Katz's theory of translation, combined with his definition of entailment, implies that this language could not be translated into English nor the converse, violating T! These sort of difficulties will be set aside, since, oddly, none of Katz's critics sized on this apparent weakness in his overall project, and because it raises deep issues about analyticity, and also the applicability of logical notions like entailment to natural languages.

translatability. Briefly put, there seem to be numerous cases where entailment relations are preserved under translation, but not the SL divisions of those entailments into those which are asserted directly and those which are presupposed[60]. In other words, information that is presupposed by the SL sentence must be directly asserted in the TL, because the latter does not have some feature that is necessary in order to generate the presupposed entailments and is therefore required to state them overtly.

After even a superficial look at the cross-linguistic data concerning the highly variable ways that different NLs depend on presuppositions, a definition of translatability that required the presupposition/assertion division be respected seems a very dubious proposal. It might be supposed, then, that Katz would simplify modify his theory and move to a less restrictive definition of translation. After all, this might be accomplished by some relatively minor adjustments to either his definition of entailment, or of translation. However, it seems that Katz could not make this move and remain consistent with his general identification of semantics and logic, in the broad sense of the study of inference patterns between propositions, as the same enterprise, which was in turn a result of the identification of sentence meanings with propositions (Katz 1972,1978; see also §2.2). Since rendering a presupposition as an assertion would change the inferential and truth conditional properties of a sentence, this could not be allowed on Katz's definition of translation (this will be discussed in more detail in §6.3, but be cautioned that all of this is an extrapolation and not explicit in his work).

Instead, Katz would argue that in each case of an apparent counterexample translations do exist- albeit, generally speaking, not very natural sounding ones- that exactly preserve all semantic properties, including presupposition structures. Some of these translations may be very

[60] Keenan (1974,1976,1978); Givón 1978; Matthewson 2006; von Fintel and Matthewson 2008

different at the syntactic level, due to differences in the syntax of the SL and TL. In one of the most discussed cases (described in §6.3) information entailed by a relative clause in a Hebrew sentence would need to be expressed without the use of such a clause in English because in the TL, English, a relative clause cannot be formed that would have the same properties as that in the original sentence. Katz acknowledged that in such instances, although translation is successful at the semantic level- all ***K***-properties and ***K***-relations of the original are preserved, as required by ***T***- there is something outside of ***K*** which is lost.

This leads to the observation that, for purposes other than the study of semantics, different, more restrictive, criteria may be appropriate. To make this more concrete, Katz called for a hierarchy of translation criteria, each level incorporating all of the requirements of lower levels and adding new ones, so that they are successively more restrictive. The preservation of all elements of ***K*** was to be the base level, the level at ***T*** was held to obtain. For all higher levels Katz acknowledged that counterexamples to universal translatability could easily be identified. He tentatively offered the following hierarchy (Katz 1978:226):

Level	What must be preserved by translation	Example **(a pair of sentences acceptable by the previous level that fails at this level, all examples from Katz 1978: 226-27)**
K	The semantic properties and relations of senses	
K₁	***K*** + deep syntactic structures and relations ("definable over phrase markers representing the deep structure")	(1)"I need someone who has earned the degree of doctor of medicine or the equivalent." (2) "Necsito un doctor."
K₂	***K₁*** + the surface syntactic properties and relations ("definable over the structures from which a natural language chooses the surface form of its sentences")	(1)"The boy drinks whiskey and the girl wine." (2)"Le garcon boit le whiskey et la jeune fille boit le vin."
K₃	***K₂*** + the phonological properties and relations (like "rhyme, alliteration and meter")	(1)"The rain in Spain falls mainly in the plain." (2)"Descz v Hispanii pada przewaznie na dolinie."
K₄	***K₃*** + "connotations"	No example provided.

The extension of the hierarchy past the base level ***K*** required some linguistic theories regarding the non-semantic properties and relations of sentences used to define those levels.

Therefore, Katz grounded levels $\boldsymbol{K_1}$, $\boldsymbol{K_2}$, and $\boldsymbol{K_3}$ on what he took to be the best available theories of transformational grammar. The final level, $\boldsymbol{K_4}$, was suggested more tentatively, on the grounds that a frequent criticism of translations is that they fail to preserve all of the "connotations" of the SL sentence (Katz 1978:227). This is especially true when the SL sentences contain lexical items considered slurs or swear words, which often have important conative implications[61]. Establishing such a hierarchy provides a response to a critic who might argue that $\boldsymbol{T}$ is invalid because such implications cannot always be retained under translations: $\boldsymbol{T}$ is a semantic principle, defined at the level $\boldsymbol{K}$. Sentences that are untranslatable at other levels may be significant for other reasons, but are not evidence against $\boldsymbol{K}$.

Katz presented the hierarchy as a strict one, so that meeting the criteria at each level would require meeting all those present at lower levels as well. This reflects the notion that although we might, for example, find for an SL sentence a TL counterpart that matched its syntactic structure perfectly, it would not count as a translation if semantic properties and entailments were not the same. This much seems correct; two sentences may have matching surface structures without any of the words bearing any semantic relation to one another, but such a relation is largely irrelevant for the study of translatability.

Past the separation between $\boldsymbol{K}$ and the other levels, it is more questionable whether this strict ordering is desirable. It would be odd to suggest, for example, that when passing from $\boldsymbol{K_2}$ to $\boldsymbol{K_3}$ that we would want to require that a sentence's surface structure be preserved in order for rhyme and alliteration to be successfully translated, or it to be necessary to capture rhyme in

[61] Potts (2007) calls this the *expressive* aspect of meaning and notes that it is particularly difficult to provide definitions of expressive terms such as "bastard". Speakers are generally not satisfied by any paraphrase, since they often feel that some important aspect cannot be preserved. This resistance to paraphrase might well be compounded cross-linguistically.

order to say that all of the original connotations of an SL sentence have been translated. What this seems to imply is that it may be more accurate to envision not a strict hierarchical relation, but instead a number of criteria that may or may not be added to the base semantic level depending on what the translator is attempting to accomplish. Translating technical passages, direct instructions, or poetry, to provide a few examples, may all call for different metrics of success. A translator of poetry may have reason to preserve meter even it means doing some violence to surface syntactical structure. In other cases, syntactical structure may be of primary importance, as in word-for-word translation, and in still other cases some connotation carried by the SL sentence may trump all other considerations, even semantic ones[62]. Then it would seem wrong to maintain that a translation which preserves whatever properties the translator is primarily concerned with is a failure even if it does not capture a level lower on the hierarchy. It might also be suggested that the categories should be finer grained; for instance, a translator who, for a specific task, is concerned with style may aim to preserve meter but not alliteration (see Hofstadter 1997 for a discussion of such choice points in literary translation).

This sort of differentiation is common in translation studies. For example, it has been observed that "translatability and untranslatability exist side by side in English and Chinese simultaneously" because the same TL text may be a successful translation of an SL text for some purposes, but not for others (Wang and Zhou 2018:307). Or, more generally, "the question to be asked is…is not whether the two texts are equivalent…but what type and degree of translation

[62] Consider translating *you son of a bitch* into French. The literal translation- *fils de cheine*- would make no sense to a francophone audience, while *fils de pute* more accurately captures the connotations of the original sentence, despite not being a literal translation at the semantic level (I apologize for the highly objectionable nature, especially for female readers, of these examples, but in a sense it is the very offensiveness of the terms in question that make them suitable illustrations of the point). Or take the French *bordel*, frequently used as an adjective to convey disorder or disorganization, connotations entirely missing from the equivalent English term *brothel*. Such examples might be multiplied indefinitely.

equivalence they reveal" (Kenny 2008:80). For some of these purposes, it might be that no acceptable translation exists.

Before moving on, it might be worthwhile to stop and review Katz's philosophical motivations. References have been scattered through this section and the previous, but the big picture may appear somewhat murky at this point. The immediate motivation for ***T*** was ***E***, which Katz took, for somewhat vague reasons, to consequence of what he, in common with Chomsky (1965) called a "rationalist" philosophy of language[63]. But Katz's view of language as species specific biological endowment ideally suited to expressing thought, coupled with the theory of a common, innate conceptual repertoire, or "semantic space", might also lead directly to ***T***, without requiring ***E***. The specific form that ***T*** takes, which stipulates that all semantic properties be preserved under translation, to include the presupposition/assertion dichotomy, is a result of Katz's particular theory of semantics. On this view, natural language semantics subsumes logic, the study of the inference patterns between propositions, so a successful translation must have the same inferential properties (entailment relations, as Katz would put it) as the original. Another way of putting this is that if language are intertranslatable, on Katz's view of semantics, it follows that for any sentence of any language, every other language must have a sentence with exactly the same inferential role relative to other sentences. Therefore, we find something of an

[63] The appropriateness of the label *rationalist*, used by both Katz and Chomsky to describe themselves, might be challenged as based on a rather strained interpretation of early modern philosophers such as Descartes and Leibniz (Cottingham 1985; Reys 2021). In any case, it is noteworthy that although Katz's outlook on language was in a large part (at least in the 70s) derived from Chomsky's "rationalism", it was developed in importantly different ways that led Katz, but not Chomsky, to ***T***. Although Chomsky is occasionally associated with translatability, including by those who should know better (e.g., Steiner 1975), he was largely silent on this point, either agnostic or disinterested. Indeed, his observations on the matter seem to consist of a single (often quoted) passage in *Aspects* (1965: 30) that denies that the existence of semantic universals implies the possibility of automated machine translation. Although space precludes a full discussion of the differences between Katz and Chomsky that underlay these divergent outlooks on translatability, the key seems to have been Katz's assumption that the genetic, biological, nature of language would lead to a common semantic space, shared by all human populations, and a further assumption that the syntactic and phonological structures of all human languages would be "optimal" for expressing the contents of this space (1978:218).

explanation of why a project that was initially motivated by a theory about the universality of the human conceptual repertoire becomes so entangled in the technical details of entailment and presuppositions.

In Chapter III, many proposed counterexamples to the base level, ***K***, will be outlined, and it will be argued that at least some of these are legitimate. This suggests that in order to have an empirically adequate translatability thesis, the base level which is to hold between all NLs must be adjusted downwards, to be still less restrictive than ***K***. Some of the cases to be presented in the that chapter will aim further, putting pressure on the idea that there is *any* non-trivial level defined in semantic terms at which translation is always possible between all NLs. It will be argued that in many cases, whether or not these stronger counterexamples succeed depends on the conception of *a language* that is assumed, something that is, oddly enough, almost entirely ignored by most authors. This consideration will be discussed further in §5, as it pertains to the authors discussed in this chapter, and then more extensively in Chapter IV (where it will be argued that once the question of language identity is resolved, the entire question must be reformulated).

§4 Keenan and Criticism of *T*

Katz's overall theories of language were, to a large degree, a response to the behaviorism of Skinner (1957), the behaviorist inspired "taxonomic linguistics" of Bloomfield (1933) and especially to the indeterminacy results of Quine. In fact, Katz explicitly defined his semantic theories as a response to Quinean skepticism, on the model of Descartes responding to epistemological doubt (1979:9; 1978:192). Katz had no quarrels with Quine's derivation of indeterminacy from a starting point of behaviorism and general skepticism about the

intelligibility of semantic properties such as synonymy and analyticity. As he conceded "From within Quine's viewpoint, then it seems foolish indeed to think that some hypothesis is really right and others wrong…" (1978:232). But things change if one does not work within Quine's assumptions, especially the limitation of admissible explanations for language use and acquisition to theories that can be defined entirely in terms of observable behavior. Katz noted, likely under the influence of Chomsky, that such a stipulation on acceptable explanation risks contaminating theories about language competence with all sorts of extralinguistic factors related to performance (1978:231). Katz argued that if one admits semantic properties as real and definable, accepts the reality of propositions and the definitions of their identity conditions in semantic terms, and allows for a theoretical framework in which the semantic properties of sentences can be defined, then it is certainly possible to identify some hypothesis of translation as determinately correct and disregard others. As Katz argued that these three principles constituted the proper methodological basis, the case against Quine amounted to the assertion that he was working within an entirely mistaken framework, to which Katz was seeking to provide an alternative.

Whatever the status of this debate over Quinean indeterminacy, Katz's views on effability and translatability were later sharply criticized by a number of linguists who were not bound to any behaviorist commitments, and who expressed skepticism not at the possibility of obtaining determinate translations but rather the possibility of finding a translation at all in certain cases. It was ***T*** which would receive the brunt of the attack, since it was more obviously testable than ***E***, and because a failure of ***T*** would entail a failure of ***E***.

Prominent among Katz's initial critics was the UCLA linguist Edward Keenan, who published a paper (1974) critical of Katz's initial presentation of ***E*** and ***T*** (1972). The debate

continued with both Katz and Keenan publishing papers responding to one another's views at some length in two anthologies (Steklis et al., ed, 1976; Guethner-Reutter and Geuthner, ed., 1978). More recent linguists have also taken up the thread of this discussion (Matthewson 2006; von Fintel and Matthewson 2008; Deal 2011). All of these newer contributors have sided with Keenan.

While the bulk of Keenan's argument consisted of counterexamples to ***T*** drawn from his own work as a field linguist, he begin building his case more conceptually, objecting directly to ***E***. Keenan suggested that the expressive power of NLs are limited by the requirement that natural languages be efficient enough for communication. While this requirement does not, in theory, place a direct limit on the complexity of the thoughts that a language can express, it does rule out the existence of impractical NLs, for example a language that consists entirely of sentences too long to be of use in normal situations (Keenan 1978:160). To meet this requirement for efficiency, a certain amount of ambiguity is built into NLs. This ambiguity in turn results in limits to effability, not merely in practice, but in what a given language is capable of expressing even under ideal circumstances.

Keenan offered as an example of this sort of ambiguity the case of pronoun reference. For instance, the sentence "John told Bill that he was sick" does not have any overt device telling the hearer whether "he" is John or Bill (Keenan 1978:161). It would be inefficient for the syntax to require that the reference of the pronoun be overtly specified, since the audience will generally be able to supply this information themselves. In fact, no NL is known to index pronouns at the surface level in order to fully specify their reference. Doing so would place an unnecessary strain on working memory and other cognitive resources when the relevant connections can easily be discerned from context (Keenan 1978).

Consideration of interlinguistic variation and of this requirement for efficiency led Keenan to suggest modifying ***E***. Dispensing with propositions as an unnecessary layer of ontological complication, he proposed the following (Keenan 1978:162):

> **(*WE*) Weak Effability:** "Anything that can be thought can be expressed with enough precision for efficient communication."

There may be an initial impression that the two debaters were talking past one another because Katz invoked propositions while Keenan preferred to discuss thoughts and sentences. However, the two theories are commensurable because of Katz's identification of propositions with types of thoughts, and it is clear from the context that Keenan is using "thought" in reference to types, not tokens. For clarity, I will continue to use *proposition* for this purpose, as Katz did, except when directly quoting.

What Keenan intends by ***WE***, exactly, is made more specific in later discussion. Every language can *communicate* every proposition, at least when performance issues are set aside, but the precision with which they actually *express* the given proposition, and what is left up to speakers to recover from contextual clues, will vary from case to case, with significant cross-linguistic variation. Thus, an SL sentence may differ significantly at the semantic level from the closest TL translation. Keenan maintains that this is because, as a matter of empirical fact, different languages meet the need for efficiency differently, relying on presuppositions, context, and ambiguity in varying ways. Then ***WE*** predicts that languages are uneven enough in their

expressive power that counterexamples to $\boldsymbol{T}$ can be identified, demonstrating that the stronger $\boldsymbol{E}$ does not obtain[64].

Keenan qualified his claims in two important ways. First, since he hypothesized that $\boldsymbol{WE}$ holds, he predicted that failures of translation would not be radical. Indeed, for the examples that Keenan discusses, he admits that translations do exist that can serve for the purposes of practical communication. But, at the same time, in some of these cases, enough semantically important differences exist between an SL sentence and its nearest TL equivalent to violate equivalency at the base level $\boldsymbol{K}$ in Katz's hierarchy, and so provide a counterexample to $\boldsymbol{T}$. Second, because of the infinite capability of NLs to generate sentences, Keenan took it to be impossible to provide conclusive proof that for a recalcitrant SL sentence, there really is no TL equivalent that preserves all semantic properties (Keenan 1976,1978). It is always possible that a more skilled translator, or one with more time, may be able to accomplish the task with some sentence that has not yet been considered. But this possibility can be minimized by identifying cases that are not isolated, but rather indicative of systematic differences in expressive power across NLs. If such cases could be shown to be widespread this would show $\boldsymbol{T}$ to be inductively unlikely enough to shift the burden of proof onto its proponents.

Keenan turned to work in comparative linguistics in search of counterexamples that would indicate such systematic differences amongst NLs, especially his own work on Austronesian languages (Keenan 1972a, 1974,1974,1975a,1975b). Keenan did make a brief discussion of cases where NLs differ in their lexical resources, only to set this kind of case aside

[64] It is also worth noting that $\boldsymbol{WE}$ amounts to almost the direct opposite of Searle's Principle of Expressibility, the idea that a speaker can always make fully explicit exactly what they mean if they are willing to talk long enough (see §1.3). While Searle offered only a short conceptual argument, based on some passages of English, Keenan provided analysis of examples drawn from several languages. The interested reader is invited to judge for themselves between these two proposals after seeing some of Keenan's examples in Chapter III.

for the sake of argument (see the next section and also §6.1). The counterexamples that he did discuss at length involve cases where *syntactical* differences between two languages result in an inability to preserve the division of entailments into presuppositions and assertions. The general form of these sort of objections will be discussed in more detail in §6 of the current chapter, with specific examples examined in Chapter III. For now, we should pause to consider some abstract but important conceptual issues.

§5. The Nature of Language and Translation

The last paragraph of the previous section mentions cases where translation issues arise due to a simple mismatch in vocabulary, that is, there is a word in the SL with no equivalent in the TL. This is the sort of situation which Quine had in mind in the famous passage where he asked how a translator might render sentences about neutrinos into a hypothetical "jungle language" (1960:76). Quine's answer was that a translator in such a situation will be forced to coin new technical vocabulary or import a foreign loan word, to make up for the absence of a term for *neutrino* in her own language. Katz acknowledged that such methods might be necessary, but regarded this as unimportant when discussing ***T***, as they represent merely steps taken to correct a "temporary vocabulary gap". (Katz 1978:220).

Quine's conclusion may seem rather hasty. It is one thing for, say, an English speaker to introduce a term such as *schadenfreude*. If an interlocutor could not pick up the meaning from context, it could be easily supplied, i.e., *pleasure at the misfortune of others*. Introducing *neutrino* to a language without any vocabulary for the concepts of particle physics, perhaps with no scientific vocabulary at all, seems a quite different matter. The meaningful introduction of neutrino to a true "jungle language" would require the introduction of a great deal of further material quite alien to the TL as it currently exists.

Quine might argue that this would merely require more of the same, that is, the introduction of enough new vocabulary to make neutrino intelligible. Katz actually made such a case in his earliest discussion of ***T*** (1972:21), where he imagines the following thought experiment: A native of a remote Pacific Island learns physics while studying in America, and on his return wishes to share his knowledge with the islanders who are monolingual speakers of their own "primitive" language.

> What he must…do is either use English words for concepts not in his language or else make up words that more readily fit into the phonology of the language. In either case he will have to introduce a large stock of new words, but he will rely on the already existing semantic structure…and on the already existing syntactic and phonological structure of the native language to make it possible to form sentences with them that express the laws of modern physics….We do not suppose that by so enlarging the vocabulary of his native language he has in fact changed the language essentially, just as we do not assume that English has changed essentially as a result of the increase in the number of vocabulary items brought about by the rise of science in the last hundred years, and we do not assume that modern Hebrew, with its highly modernized vocabulary, is not Hebrew.

Thus, Katz concludes, both ***E*** and ***T*** depend on the following principle concerning language stability and change (Katz 1972:21, presentation adapted for clarity in the present context):

Principle of Language Stability (*St*): A language L cannot be said to have changed over the period from T_1 to T_2 even though at T_1 L does not contain a sentence S but at L does contain S at

T_2 , if it is the case that is only the addition of a finite number of lexical items to L that results in the addition of S.

In sum, Katz is resting his case on the assumption that the lexicon of a language is inessential to its identity, so that its grammar is what differentiates it, or constitutes its identity. One might question whether it will always be the case, as he assumes, that existing semantic and syntactic structure of the language will always be able to support the expression of new concepts- this is, in fact, a highly nontrivial assumption (this will be discussed further below), and it seems that by assuming this, Katz is essentially assuming that ***T*** holds. Even if this point is left unchallenged for now, it is notable that Katz frames his discussion in terms of the sort of open-class vocabulary required to label new technologies or discuss new scientific theories. But, as will be seen in the next chapter, most challenges to translatability are focused on closed class, or functional lexical items, whose addition to the language is not a matter of course, and their introduction in order to obtain translations is more dubious. For instance, a translator working into English from an SL such as French whose second person pronouns are divided into those for formal and informal address is unlikely to meet the challenge by simply borrowing or making up new pronouns. We would likely question whether a TL text that relied on such methods was in fact a successful translation, as opposed to a marginally intelligible mess, even if the translator glossed, or defined, the new words.

Considering this contrast, between open and closed class vocabulary, leads to a difficult issue that is discussed far too little in the literature, both philosophical and in translation studies: when discussing hypotheses such as ***T***, what limits should be set on the extent to which a hypothetical translator can extend the TL? E.g., if we feel that the import of a word for neutrinos is a fair move, but that the creation of a new pronoun is somehow cheating, can we make the line

precise? Providing answers is bound to become complicated, because this will inevitably lead to further questions about what a language is, and how languages are to be individuated. In this section, I will examine the views which our main protagonists, Katz and Keenan, had on this topic, which has also received (shockingly) little mention in the literature. I will leave sustained discussion of what the appropriate answer is for Chapter IV (where I will argue in favor of framing things in terms of I-languages).

In Katz's later work he explicitly identified a language as a class of sets of sentences (Katz 1981). All possible sets of sentences, generated by any real or possible grammars, exist as abstract objects, somewhat similar to the natural numbers. Any particular such set can be grasped by a language user as their idiolect. A set of sufficiently similar such sets is a dialect, while a set of similar dialects is a language. What constitutes "sufficiently similar" is unsettled, but Katz was not bothered by this, as he asserted that the question of individuating languages was also a problem for any rival theory[65].

> There is an infinite range of such classes, including English, French, Sanskrit, Engrench (i.e. a class of sentences with English syntactic structure but an anglicized French vocabulary), and infinitely many other languages, living, dead, unborn, conceivable and inconceivable. (Katz 1981:9)

[65] An attentive reader may have noticed that this statement on the nature of language dates to a few years after the last shots were fired between Keenan and Katz. In the 1980s, Katz turned most of his attention to defending this Platonic conception of language against Chomskyean "conceptualism", whereby language is a matter internal to the mind of a speaker (see, for example, Katz 1985). There is fairly strong evidence that Katz held something approaching this view of language as an abstract object during the 1970s as well. One reviewer of Katz's 1981 *Language and Other Abstract Objects* noted "[Katz's] Platonism can be traced back to his *Semantic Theory* (1972)" (Allen 1983:678) and cites the following passage, which discusses the concepts designated by semantic markers, as representative: "Concepts…are abstract entities. They do not belong to the conscious experience of anyone" (Katz 1972:38). In another key passage in the same work, Katz considers and rejects a definition of language similar to what Chomsky would later call an I-language. Katz (1972:16) concludes that "A language is not itself subject to the fate of the mortals who speak it. It is some sort of abstract entity, whatever this means."

These sets are Platonic objects, eternal and unchanging. Historical language change and evolution are changes to speaker's knowledge of these sets, rather than a change to the sets themselves. Thus, when a new word is added by Katz's hypothetical islander for purposes of discussing the physics that he originally learned in English, there is no question of whether a language has been extended or enriched, or a new one created, or what exactly has occurred. Rather, up-to-date "island" speakers have simply shifted what abstract object they have knowledge of, from one that contains no sentences discussing modern physics to one that does contain such sentences, but which is still sufficiently similar to be considered "island".

This is a view of language that has been contentious and could warrant an extended discussion in its own right. What is important for our purposes is that it is entirely consistent with, and may have been to some extent the motivating factor, behind Katz's principle $\boldsymbol{St}$. Even though the boundaries of *a language* are vague, a translator can shift from one abstract set of sentences to an expanded one, produced by the addition of loan words or neologisms, without moving outside of the class which constitutes a particular language.

In contrast, Keenan never entered into the question of what a language is. He did mention that "The meanings that can be expressed in a human language can be represented by the set of sentences of the language" (1978:164), a view which is not incompatible with Katz's. He explicitly noted that a language will not change identity with the addition of a loan word: "It is the nature of human languages to allow vocabulary increases without changing the identity of the language" (1978:174), although it is not clear what Keenan holds the identity of a language to be in the first place, or what would in fact constitute a change to that identity. However, Keenan regarded the introduction of new vocabulary in order to provide a translation as "cheating" (my term) as far as discussing $\boldsymbol{T}$.

Keenan asserted explicitly at one point that translatability is a relation that obtains between two languages at a particular point in time: "The claim we are arguing against is that any two human languages, *as they stand*, can be exactly translated into one another" (1978:174, italics added). Keenan gives an example meant to compare two sorts of arguments available to supporters of ***T***. He begins by presenting some dubious "evidence" that is occasionally presented against ***T*** (1978:174):

> It is sometimes argued that perfect translatability fails between two languages because e.g., Eskimo (reportedly) has a word that means 'snow that has been partially melted and then refrozen', whereas English lacks such a word and English speakers lack such a concept.

One possible response, which Keenan approves, is to point out that whether English has a simple name for this phenomenon or not, it has the lexical resources to refer to it, as was just demonstrated in the quote above. But another line of response would be to simply shrug off the counterexample and respond that a new English word could be created, "…say, *smush*…" (1978:174) to cover the gap in vocabulary. After all, the addition of a single word to a language does not change its identity. Keenan rejects this second sort of argument, suggesting that accepting this sort of move by a translator would trivialize ***T***, changing it from the claim that all languages have the same expressive power into the claim that all languages can be augmented until they have the same expressive power. He states (1978:174)

> We would agree that English remains English under such conditions. But this fact is irrelevant to [***T***]. For suppose that before the addition English had no way to reference such snow and no way to translate exactly the relevant Eskimo sentences. In

> such a case [***T***] would simply fail, and the addition of *smush* to the language would change its expressive power, even if the syntactic change in the language is judged trivial.

Keenan argues that, although English clearly has a way to reference refrozen snow without the introduction of new vocabulary, there are many pairs of languages where one displays a gap in the lexicon relative to the other that cannot be defined or paraphrased away. This situation is, he suggests, to be expected based on extralinguistic factors, as there are numerous cultural practices and technologies that are not shared across populations that speak different languages. Keenan gives the example of Warlpiri, a numberless language, and asks how any combination of the existing vocabulary of that language might be used to express ideas such as "irrational number" or "cube root"[66].

It is worth noting that Keenan was discussing whether or not the addition of new vocabulary might change the identity of a language but never stated, even approximately, what language is, or what the identity criteria for *a language* might be. As noted previously, this is actually a problem that permeates discussion of translatability in general, and makes it difficult to evaluate statements about how much a language can be extended and still remain the same language. However, it is clear that Keenan finds it appropriate, for purposes of discussing translatability, to view these entities as they exist at a moment in time, with all syntactical and lexical resources fixed. Whether this is even an entirely coherent project might be fairly doubted, since the lexicon, and to a lesser extent the syntax, of any NL will be in a constant state of flux and will vary between various groups of speakers of a "single language" in any case. These issues will be examined further in Chapter IV, but for the present moment what is important to note is that there is a key difference here between Keenan and proponents of ***T***. Sapir and

[66] The specific example of Warlpiri is actually far from as clear-cut as Keenan regarded it; I will return to it in §6.1 below.

especially Jakobson discussed translatability in terms of temporally extended, protean entities that could be extended as necessary to meet the expressive requirements of speakers (§§1.1,1.2), a view which Katz evidently shared[67], and which we also find in Tarski (§1.3).

More recently, Deal discussed these two approaches. Her careful and detailed work with Nez Perce (2011) provided some of the most damaging evidence to date against ***T***, which she calls the "Jakobsonion" position (see Chapter III, §3). Initially, she presented this study as joining a growing collection of work, including that of Keenan, Matthewson (2006), and Bittner (2005), that "…amounts to an unambiguous assault on the Jakobsonion view…" (Deal 2011:577). On later reflection, she noted that her earlier assertion rested on a particular view of a language as a static entity, and came to the following conclusion about the sort of evidence she was discussing (Deal 2014:5):

> I think it is compatible with Jakobson's view. In the long run, speakers of any language will be able to find a way to use their language to talk about any kind of thing. In the short run, there may be 'deficiencies', or lexical gaps, and this can affect the sorts of messages that speakers are able to straightforwardly convey.

So, there are two ways of examining ***T***: the "short run", favored by Keenan, Matthewson and Bittner, and the "long run" favored by Katz, Sapir and Jakobson. At this point in the dissertation, I will not attempt to arbitrate which is correct. I will merely note, as Deal did, that the question of translatability can be approached from (at least) two angles. This can be spelled out more explicitly, and I will turn to this below. But first, we should address Keenan's charge,

[67] Of course, for Katz, it was not that the languages themselves were being extended, as he considered them to be changeless Platonic objects, but a speaker might move from knowledge of one such object to a slightly different one while still remaining within the class of objects considered to constitute a single language.

which at first glance has the force of common sense behind it, that the "long run" view reduces ***T*** to triviality.

Deal, Katz, Jakobson and Sapir all assert that when an NL is deficient in expressive resources as compared to some other, new resources can be generated so that the two cover the same semantic space, or even simply borrowed from the richer language. Actually, *contra* Keenan, that all NLs are commensurable in this way, such that relative gaps can always be repaired by augmentation, is a far-reaching and certainly non-trivial claim! Unless one has already, like Katz, accepted that the conceptual repertoire and Universal Grammar are both innate, it is not a minor assumption that NLs have this relation; rather, this is an important thesis about the nature of human languages, the faculties underlying human linguistic capacity, and the human mind in general.

To motivate this claim of non-triviality, consider that this is certainly far from automatic that languages should have this relation. It does not hold of other systems of animal communication, such as the dance of the bees, the barking of dogs, or birdsong. As Katz pointed out, all of these systems can express propositions only over a sharply limited range, and vocabulary to express ideas outside of these ranges cannot be added to them, e.g., bees will not extend the range of their dances to discuss philosophy or religion. Neither their minds nor their "language" are suitable to the task.

Consider the case of the language of classical propositional logic, $\mathcal{L}_{\wedge,\neg}$ and the language of FOL. There is no question of "extending" $\mathcal{L}_{\wedge,\neg}$ by adding new symbols in order to give it the expressive power of FOL. Consider trying to somehow render $\forall xFx \vDash Fa$ into $\mathcal{L}_{\wedge,\neg}$ in a way that would preserve the entailment, which is a widely agreed upon criterion for translation of

both formal and natural languages (albeit with a somewhat different concept of *entailment* at play in the two cases). As discussed in Chapter I, §2, there is no non-arbitrary mapping that can accomplish this translation (although the situation is unexpectedly complex, see that chapter for discussion). But neither can it be accomplished by "simply" extending $\mathcal{L}_{\wedge,\neg}$ with the new vocabulary $\forall xFx$ and Fa; these are sentences that cannot be generated by the syntax of $\mathcal{L}_{\wedge,\neg}$. But more importantly, $\mathcal{L}_{\wedge,\neg}$ has a much different semantics than FOL and is interpreted over an entirely different class of models. It makes little sense to consider grafting $\forall xFx$ into propositional logic and just stipulating that it "means the same thing" as it does in FOL, and even if one did add both this sentence and Fa, the semantics of $\mathcal{L}_{\wedge,\neg}$ is too course-grained to capture the relation between them.

Katz and others who take the "long run" view are claiming that *no* pair of NLs has a relation like that of FOL and $\mathcal{L}_{\wedge,\neg}$, not only in the sense that FOL cannot be translated into $\mathcal{L}_{\wedge,\neg}$, but also because there is no way that $\mathcal{L}_{\wedge,\neg}$ can be extended to match the expressive power of FOL (without fundamentally altering the basic syntactical and semantic structure of the language to the point where it just *is* FOL). ***T***, interpreted as Katz and the other linguists just discussed did interpret it, is the claim that NLs can add new words to cover the concepts expressed in other languages, and even borrow from other languages as needed. This is evidently a substantial claim. It is a claim about the languages themselves, that they have a core syntactical and semantic structure similar enough to allow pieces to be seamlessly grafted from one to another. If true, this provides evidence for the theory that languages share important universals, and another nail in the coffin of the old claim that "Speech…varies without assignable limits as one pass

from social group to social group" (Sapir 1921:4)[68]. It is also a theory about the human mind, since it amounts to the assertion that any proposition that can be thought by the members of one population can be thought, under the appropriate circumstances, by the members of any other. This would hold regardless of genetic or cultural variations, or whether, prior to extending their language, the population in question had a linguistic means to express the given propositions. It is also a claim about the mental faculties underlying language acquisition and use, since these must be able to support the expression of the same propositions, and to grasp all of the concepts necessary. In sum, the "long run" view of ***T*** is far from trivial.

But all of this is not to say that when we consider the possibility of a translator extending or augmenting the resources of a language that "anything goes". There are ways of "extending" a language that, if allowed as admissible, really would reduce ***T*** to triviality. Keenan suggests that Katz's definition of synonymy allows one such (Keenan 1978). Recall that on Katz's definition, if sentence A is ambiguous, that is, has multiple senses, only one of its senses need be shared by sentence B for the two sentences to be considered synonymous and, if they are part of separate languages, acceptable translations of one another. E.g., "C'est dangereux de piloter des avions" is an acceptable translation, in the appropriate context, of "Flying planes can be dangerous" even though the French sentence can only express a single one of (at least two) meanings available to the English sentence. As an extreme case, a hypothetical language might contain a single one-word sentence that would be infinitely ambiguous, with one meaning for every English sentence. On Katz's criteria, Keenan claims, this language would be fully translatable with English (1978). Alternatively, we might imagine a hypothetical translator "extending" the TL with such a word

[68] Although this is an often quoted passage, a closer reading of the entire work, as well as the material discussed in §2.1, point to the conclusion that Sapir intended this comment only for some relatively superficial aspects of language. See Kemmer (2009) for discussion.

in order to translate every possible sentence of any other language, thus eliminating any possible challenges to ***T***.

Katz might have responded by challenging the coherence of an infinitely ambiguous sentence. Instead, he reiterated that ***T*** was an empirical theory about actual NLs (Katz 1978). As a point of fact, no NL like the one described exists, and so this is of no relevance as far as ***T*** is concerned (for one thing, such a language would be non-compositional in a particularly dramatic way). The same response applies to extending languages in this way. Such massively ambiguous sentences are simply not a part of the semantic structure of any human language, and it is unclear how any language could be extended to accommodate them.

This holds for similar proposals that might trivialize *T*. For instance, since Katz allows for the use of neologisms, one might imagine a translator who, every time she is faced with an untranslatable SL sentence, simply coins a new TL morpheme which she stipulates to have the same meaning as the sentence in question. But NLs do not express complex propositions through simple morphemes. To be clear, the claim is not that some languages, e.g., polysynthetic ones, do not express in a single word what others would use a sentence to convey. However, in those cases the "sentence words" in the polysynthetic languages are highly complex, consisting of multiple meaningful elements (Baker 2001). Nor is the claim that there are not words whose meaning requires a number of other words to translate, e.g., *schadenfreude*. Even within the same language, some words require substantial dictionary entries. But there just are not simple morphemes in any language that express truth evaluable propositions, that is, that express what is expressed in English through an assertive sentence that might be judged true or false[69]. Thus,

[69] While I cannot directly provide a direct reference for this claim, it follows from two widely (although perhaps not universally) held claims: that meaning is compositional, in the sense that sentence meanings are built up from simpler elements (von Fintel and Matthewson 2008), and that all languages have elements corresponding to nouns

extending a TL through neologisms of this sort would be something like extending it through the use of an artificial code, a case not intended as covered by T (notice that this would be a violation of the principle St). One might be able to imagine borderline cases, and the requirement that extensions remain within the resources available to human languages would certainly be difficult to spell out exactly, but Katz's response to Keenan on this point seems clear enough to be adequate for present purposes.

In any case, counterexamples based on lexical gaps that might be covered by extending the vocabulary of a language play only a relatively minor role in Keenan's own work on the subject. Instead, he concentrated on cases where untranslatability results from different operations being available to SL and TL in order to transform basic sentences into more complex ones. Even if translators are allowed to unrestrictedly coin neologisms as needed, it would remain possible that there are, for some pair of languages, SL sentences whose meaning cannot be captured by any grammatical TL construction due to syntactical restrictions (a number of examples from Keenan's own work will be discussed in the next chapter). Thus, there are cases which will remain contentious even if unlimited introduction of vocabulary is allowed.

Of course, this raises the question: if we are allowing the introduction of vocabulary, why not the bending of grammatical rules? One option at this point would be to try to examine exactly what sorts of maneuvers might be allowed without trivializing $\boldsymbol{T}$. However, we are unlikely to find an answer to this question that would be acceptably non-arbitrary. Another, more tenable, proposal would be to define a hierarchy of levels of translatability that might obtain

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and verbs which must be combined in order to express complete sentences (or their equivalent in synthetic languages) (Baker 2001). It is undeniable that languages contain idioms which are non-compositional, and it is imaginable that some languages might have developed idioms in which a single morpheme expresses an entire proposition. Still, the point in the main-text paragraph holds, because the extensive use of such idioms is not a feature of natural languages.

between a particular SL and TL, depending on the sort of extension of the TL that is necessary in order to obtain a successful translation of the most recalcitrant SL sentences. In principle, we could imagine assigning a level to every pair of NLs. Obviously, this must be in principle only, since there would be no way in practice to ascertain that we have identified the most untranslatable sentences for any pair of NLs. But having some such hierarchy would provide a useful tool for categorizing the cases that we encounter.

Naturally, the base level would be that at which no extension is required at all, and any SL sentence might be fully translated by means of the lexicon and syntactical devices currently at hand in the TL. Translation even at this base level might require that gaps in vocabulary be analyzed away using TL vocabulary, so that very long and artificial sounding sentences may result. This is not a problem for ***T***, as translatability is a question of semantics, not style. As a next step, we might allow the introduction of new lexical items to the TL, either borrowed or coined as neologisms. But this level can be more finely differentiated. We might draw a line between the addition of *open-class* lexical items, such as nouns and verbs, and *closed-class* lexical items, which are functional items such as pronouns, coordinating terms, determiners, modals and so on.

The addition of open-class lexical items to a language is a relatively common place event, especially for widely spoken languages. The Oxford English Dictionary records some 700 new entries in the first half of 2021[70], all of them open-class words (*glitterball*, *webcamming*, *umute*….). In contrast, although new-closed class items do enter languages, their introduction is much rarer and usually incremental. It has been noted that English has recently undergone a

[70] https://public.oed.com/blog/the-oed-june-2021-update/; this list does include new meanings assigned to previously existing words, e.g., one item on the list was the new use of "fleabag" as referring to a disreputable person.

broadening of the class of prepositions by including participles such as “including”, but the remaining catagories of closed-class words have remained resistant to expansion, which can be seen in the difficulties with attempts to introduce gender-neutral pronouns (Downing and Locke 2002). In fact, any given individual is “extremely unlikely” to see a new function word introduced during their lifetimes (Akmajin et al. 2001).

In most contexts, we are much more likely to accept as a successful translation a TL text that contained a borrowed or newly introduced open-class item than one that contained a borrowed closed-class term. There seems to be some justification for this preference, in that the introduction of new functional items, which play a central role in syntactical structure, represents much more drastic adjustments to a language. Indeed, in some linguistic theories function words are critical to the individuation of grammars.

> Function words…capture much of what makes one language grammatically different from another. Though all languages have function words, the properties of the words differ in ways that can have large effects on the structure of the sentences in the language. (Pinker 1994: 112)

> [I]t seems that one could essentially write a whole grammar of a language by describing just the functional morphemes in that language. This intuition is often framed as a principle of natural language: cross-linguistic variation in the grammar is confined to the inventory and properties of functional morphemes. (von Fintel and Matthewson 2008:157)

From a psychological standpoint, it has been noted that that function words have a syntactic role, “providing the scaffolding of the sentence”, so that “Accordingly the mind treats function words differently from content words” (Pinker 1994: 112). In other words, the cognitive

effects of functional vocabulary are different from those of open-class vocabulary (Bloom and Keil 2001, Evans and Levinson 2009). Therefore, there seems to be a sense in which the introduction of a new functional term represents a different type of alteration to a language than the introduction of a new open-class item[71].

This is not to say that that the boundary between the open and closed class is always clear. For instance, the class of prepositions in English is something of a gray area, as are *light verbs*, verbs that have little semantic content and might seem to perform more of a grammatical role, e.g., *do* in English (Butt 2003). Nor are the classes drawn up the same across languages. Still, there is enough clearly functional vocabulary in all languages that have been inventoried (Pinker 1994, von Fintel and Matthewson 2008) that marking the distinction seems potentially fruitful for the study of translatability.

It is almost certain that we would reject any translation that reproduced SL syntax in the TL. That is, if the meaning of the SL sentence cannot be expressed by a grammatical sentence in the TL, because that meaning was somehow dependent on a syntactic construction unavailable in the target language, then it would be regarded as untranslatable (this is, putting aside for the moment difficulties with fixing the grammar of a public language). The syntaxes of languages do change, and change dramatically, over time, often as a result of contact with foreign cultures in a

[71] As a quick illustration of why such cases are complex and might entail far-reaching consequences in a language, consider the case of Salish determiners (this will be discussed in more detail in the next chapter, §3.1). All languages in the Salish family lack a definite determiner (such as the English "the"). In this case, introducing a new lexical item to fill the gap would be far from a simple matter, since that new word would also have to function as a determiner, and Salish determiners as a class behave very differently from those in English, for instance in what sorts of entailments they trigger. There are other cases like this one, in which a specific category of closed class items function differently enough across SL and TL that it would be difficult to introduce new words in order to fill a relative gap in vocabulary, or where one language completely lacks a category of closed class vocabulary found in another (e.g., Serbo-Croatian has no determiners whatsoever, Progovac 1998). It might seem difficult to conceive of any such cases involving open-class vocabulary, although we will see some examples later where the absence of entire categories of vocabulary (e.g., numbers, directions, color words) make the introduction of new vocabulary of that type somewhat problematic.

sprachsbund, although the change is a more gradual process than the introduction of new lexical items. English, for instance, has shifted word order from object-verb to verb-object, but this process took place over centuries during the later medieval period (Kroch 2001). However, if we allow a translations to be produced by adding new syntactical patterns to the TL as well as new vocabulary, this opens the door to simply adding unaltered SL sentences to the TL. This must, then, represent the limiting case of translatability.

We might imagine a further level where no extension will allow successful preservation of some SL sentences, even if we allow grafting of entire SL sentence directly into the TL. Clearly, this level of incommensurability is very unlikely to obtain between NLs, but we can find examples elsewhere. As discussed previously, even if we "translate" FOL sentences into propositional logic by adding new symbols to the language, the original semantic significance and the relations between sentences will be lost because the two languages are defined over different classes of models. Stretching the definition of *language* somewhat, English sentences cannot be added to the system of bee dances; even if the bees were somehow able to physically reproduce the sounds of a human language, their own "language" is structured to deal with far too narrow of a range of propositions (as Katz noted in discussing $\boldsymbol{E}$, see §2.3) and it is very dubious that the mind of the bees can support the sort of concepts that English expresses. A similar situation may occur if humans encountered aliens who were intelligent but whose communication systems was limited in some way.

We might summarize our hierarchy of translatability as follows:

$\boldsymbol{E_0}$	No extension of the TL is required to construct a TL sentence to translate any SL sentence
$\boldsymbol{E_1}$	Translation of some SL sentence will require the addition of new open-class lexical items to the TL
$\boldsymbol{E_2}$	Translation of some SL sentence will require the addition of new closed-class lexical items to the TL
$\boldsymbol{E_3}$	Translation of some SL sentence will require alterations to the syntax of the TL
$\boldsymbol{E_4}$ **(?)**	At least part of the SL cannot be translated into the TL, no matter how the TL is extended

Defining translatability as a matter of degree follows the practice of translation theorists. In so far as translatability between two sentences, texts or languages is regarded as a quantity which can be objectively studied, it is seldom held to be an all-or nothing property (Pym and Turk 2008; Wang and Zhou 2018).

It is clear from their writings that Katz, Jakobson and Sapir see pairs of languages standing at $\boldsymbol{E_1}$ as acceptable by $\boldsymbol{T}$, and this also falls under what Deal describes as the "long view". But all of the examples of adding words to a language which Katz, Jakobson or Sapir discuss involve open-class vocabulary, e.g., adding a word for *neutrino* to a "jungle language" (Katz 1978), for *screw* to Chukchee (Jakobson 1959) or *causation* to Inuit (Sapir 1924). Only Deal ever discusses $\boldsymbol{E_2}$; her statement that " In the long run, speakers of any language will be able to find a way…" was in reference to a case concerning modal vocabulary (discussed in Chapter III, §3.3).

$\boldsymbol{St}$ does not explicitly exclude closed class vocabulary, and Katz never mentions whether he would have regarded a pair of languages at $\boldsymbol{E_2}$ as a counterexample to $\boldsymbol{T}$. However, it is clear from the way that he actually handles specific challenges that he meant the line to be drawn at $\boldsymbol{E_1}$. For instance, in the discussion of certain functional suffixes that sometimes occur on Hopi verbs, and which have no equivalent in English, Katz searches for an acceptable English paraphrase of the Hopi sentences rather than introducing or borrowing an equivalent morpheme (Katz 1978, see also §6.3 and Chapter II, §2.1). It seems, on this basis, that Katz may have regarded functional vocabulary as an integral part of the structure of a language. This is a not unreasonable stance, and echoes the essential role of closed class lexical items in defining the grammar of a language (see quotes from Pinker and von Fintel and Matthewson above). Givón, another linguist and critic of $\boldsymbol{T}$, explicitly drew a line here, although he did so without providing any detailed justification, stating that simple differences in vocabulary are accidental features of languages, and so uninteresting, while differences in functional morphemes are central to any investigation of translatability (Givón 1978). Keenan, as mentioned previously, asserted that if a translatability principle is to be non-trivial, it must be limited to $\boldsymbol{E_0}$, but as discussed this claim does not seem correct, and in any case he did not insist on the point.

It should be kept in mind that which level on this hierarchy obtains between any pair of languages depends on what definition of translatability is being used in the first place. For example, we will see several cases in the next chapter in which two languages are at $\boldsymbol{E_2}$ by Katz's definition of $\boldsymbol{T}$, with included the strict criterion that the SL division between presuppositions and assertions be preserved, but would be at $\boldsymbol{E_0}$ by a looser definition of successful translation that required only the preservation of truth conditions.

This dissertation will not attempt to arbitrate which is the "really correct" level of this hierarchy to assess translatability. This is partially for the reason just discussed, that different languages will stand in different relations depending on the notion of translation being used, and also because it is impossible to rigorously identify two languages as standing at a certain level of translatability without first providing some identify criteria for the languages involved. I will simply note that, as with Katz's levels ***K*** of translation, different levels of translatability can be defined, and different ones may be the appropriate one for use at different times, depending on the exact question under investigation and the interests of the investigators.

A final conceptual issue should be briefly discussed before moving on, since it has been raised by the mention of a hypothetical translator extending the TL. Up until now, translatability has been discussed as a property of languages themselves, concerning their relative expressive power. This was certainly how Katz viewed the issue, as we can see in the way that he took care to draw a division between ***E*** and ***E'*** (see page 46). But now, by introducing a hierarchy of techniques allowable to obtain a translation, it seems that we have moved in the direction of discussing an act performed by a hypothetical translating agent. To be clear, translatability, as understood by Katz and Keenan whose framework we are currently using, is a relation concerning synonymy of sentences, and is therefore correctly viewed as a question about the sentences which a language contains, and what sentences it might contain under certain classes of extensions. At times, however, it may be more convenient to speak as if discussing the actions of a hypothetical translating agent, and almost all authors occasionally lapse into this way of describing things, including Katz. However, the two ways of conceptualizing the topic essentially shade into one another if we take ourselves to be considering the competence of an ideal translator, a bilingual with perfect knowledge of both SL and TL, and who is immune to

any sort of performance errors. If translatability is a question of what sentences can be produced by such an ideal translator, then this is exactly equivalent to the question of what sentences SL and TL contain.

§6. A Taxonomy of Counterexamples

With these preliminaries out the way, we can begin to discuss the empirical evidence. In this section, we will only provide an overview of the sorts of counterexamples to $\boldsymbol{T}$ that have been proposed, by Keenan and others. Specific cases, drawn from crosslinguistic studies, will be examined in more detail in Chapter III.

Alleged counterexamples can be grouped into at least two broad types. Those in the first category hinge on lexical gaps, that is, a word exists in the SL with no TL equivalent. Cases resting entirely on lexicon form only a relatively small part of the debate, both in Keenan's work and elsewhere, and as we have seen previously, there is not even a clear consensus on whether such an instance counts against $\boldsymbol{T}$, especially when the difference involves open-class lexical items (i.e., $\boldsymbol{E_1}$ cases). A second category are cases in which the syntax of the TL prevents the formulation of a grammatical expression to translate some SL sentence. This division is more for ease of presentation than for any other reason. Many of the most interesting cases involve both lexicon and syntax (e.g., the interaction of negations with verbs in Nez Perce prevents a gap in vocabulary, relative to English, from being easily paraphrased away, see Chapter III, §3), and an argument might be made for those cases involving functional words to fall into either category. Besides this, one might object that even when looking at open-class vocabulary, it is not clear that relatively innocuous cases, e.g., *Schadenfreude*, can be lumped in with more complex ones, e.g., *neutrino*. But in any case, these broad categories are useful for discursive purposes, so they will be used to organize the following discussion.

Another important division that might be made is between counterexamples that target the preservation of the presupposition/assertion division, and those that target other semantic properties, such as the basic truth conditions of the SL sentence. This categorization is an important one, since counterexamples resting on presuppositions obviously can only apply to formulations of translatability such as Katz's ***T*** that require presuppositions be preserved as presuppositions under translation. On the other hand, counterexamples in which no TL sentence has the same truth conditions (or some other important semantic property) as the SL sentence cut more broadly, working against weaker definitions of translatability as well.

By far the majority of the discussion in the literature has focused on presuppositions, a fact which is reflected by their prominence in this dissertation. This is, no doubt, at least partially because these cases are much more widespread and easier to identify than any other sort of counterexample. But the subject of interlinguistic variation in presuppositions might appear to be somewhat trivial to many readers, who may well wonder why Katz did not simply cede in the face of the evidence that translatability at this level was not universal among NLs. In §6.3, where I discuss the role of propositions at length, I will attempt to motivate why i) for Katz's overall theory of language to be consistent, he could not accept the existence of cases where presuppositions cannot be preserved, and ii) Katz aside, the question of presuppositions is worth considering in the context of translations.

Before discussing Keenan's arguments further, it should be recalled that he was relatively modest in his claims. Recognizing that the infinite nature of languages makes it impossible to declare a sentence untranslatable into some TL by simply enumerating failures, Keenan sought to identify systematic differences in the transformational processes by which languages produce complex sentences from more basic ones. By showing that some operations critical to expressing

certain meanings are unavailable in some NLs, Keenan hoped to show that, although deductive certainty could not be obtained, exact translation was very unlikely to be possible. If it could be shown to be unlikely enough across a broad enough range of cases, the burden of proof would shift to the proponent of universal translatability.

§6.1 Lexical Gaps

It is widely accepted among linguists that the basic vocabulary of an NL is never in exact one-to-one correspondence with that of any other (Hjelmslev 1943, see fn 2). In their survey of semantic universals, von Fintel and Matthewson affirm that not only is reality carved up differently by the lexicon of any two languages, but the range of concepts labelled by simple lexical items varies from language to language: "At the level of the lexicon, we find remarkably few convincing semantic universals" (2008:139). That is, there are very few, if any, concepts encoded by a single morpheme in all languages. This point is somewhat controversial, as exactly the contrary is asserted by Natural Semantic Metalanguage theorists (Wierzbicka and Goddard 1995, 2014, see §1.4, especially fn 14). Whichever side is correct on this matter, there is enough consensus that lexicons vary from language to language that there has been little interest in the possibility of word-for-word translation, rather, the full sentence is generally accepted as the minimal unit of translation (Matthewson 2004; Malmkjaer 2008a, see discussion in Chapter 0). The question then becomes whether any NL has an irreparable gap in its lexicon relative to some other NL that will affect the possibility of translating some sentences of the richer language.

Keenan pointed out (1978) that NLs require the efficient expression of certain concepts important to the culture and environment in which they are spoken, and so will employ lexical primitives which have no direct equivalent in other languages. His initial example was *mikabary*, a verb in Malagasy for the delivery of certain ceremonial speeches for which English-speaking

communities have no counterpart (1978:164). However, Keenan himself notes that this meaning can be expressed in English, in fact, he does so himself when providing a definition, thus, this case is uninteresting in exactly the same sense as the supposed Inuit word specifically for refrozen snow (see §5).

It seems that, in general, the concepts which a language labels with simple lexical items are not a reliable guide to what concepts can be expressed in that language, even without augmenting it, as Katz (1976,1978), Sapir (1924), Jakobson (1959) and Baker (2001) all observed. This position receives some important empirical support from the fact that languages often have surprising lexical gaps relative to the very cultures that speak them, something that would not be predicted from Keenan's analysis. For instance, Whorf (1940) calls attention to the fact that the Hopi language has no specific term for the kiva, a ceremonial room or building of central importance to the Hopi culture. *Kiva* is, in fact, simply the Hopi word for *building*, which has been borrowed by English speakers to become the English word for this sacred space. Naturally, the Hopi are able to refer to this space, using a variety of methods, including adding to the base word *kiva* various inflections based on occupancy and suffixes that indicate location, on a case-by-case basis. As the analytic philosopher Max Black noted in discussing this case, it would be hardly credible that the Hopi would lack either the concept itself or the means of expressing it. Thus, he notes that "If the presence of a word actively in use suggests the existence of a corresponding concept, absence of a word shows almost nothing" (1959:232). Jakobson in particular expanded on this theme, observing that communication within a speech community also rests to a large extent on analysis and paraphrase, especially when there is some difference in the vocabulary of interlocutors, with inter-linguistic translation differing only in that it relies on these methods to a greater degree.

In any case, most proponents of $\boldsymbol{T}$ assert that translatability obtains only at level $\boldsymbol{E_1}$ rather than $\boldsymbol{E_0}$, and therefore if such an analysis were unavailable to express the concept *mikabary* in English, a new word could simply be added, perhaps *mikabary* itself, without providing any evidence against $\boldsymbol{T}$. This might appear to make any sort of lexical counterexamples uninteresting[72].

However, Keenan provided a stronger counterexample along these lines, suggesting that certain concepts are so foreign to the communities that use certain languages that providing an analysis in the intended TL would be impossible. In some cases, the concept may lie so far outside anything in the existing vocabulary of a given language that even extending the lexicon to accommodate it may not always be possible. Keenan gives one example, asserting that many more exist. Many of the indigenous languages of Australia and New Guinea lack any vocabulary for referring to numbers at all, beyond those that are implicit in the determiner and pronominal

[72] A question can be raised here about whether, on a theory of meaning that is externalist to some extent, whether speakers from communities with different casual relations to some referent, call it x, can really have lexical items with x as their referent that are identical in meaning. The idea is that, just as a "Twin Earther's" term that sounds just like *water* is not the same word as our *water* (Putnam 1973), so an English speaker living in the United States cannot really have a word *mikabary* that is the same as that of a native speaker of Malagasy. Or we might ask whether the English term *kiva* really covers the same concept as the Hopi constructions used for the sacred space in a pueblo. However, whether there is an actual parallel here might be questioned. In the case of the English speaker using a word imported from Malagasy, or a word borrowed from Hopi and repurposed, there is still a causal connection running back, across speech communities, to the thing referred to, and this is lacking in the Twin Earth case. The fact does remain that the casual connection linking the typical English speaker to the referents of x is of a quite different character from that of the speakers in the Malagasy or Hopi communities, who have firsthand experience of living in the relevant cultures and interacting with x. There are certainly interesting considerations here. But the only really salient one for present purposes, in considering translatability, is whether a sentence in English using, say, *kiva*, has a semantically equivalent sentence in Hopi, and a sentence in Hopi referring to the kiva has a semantically equivalent sentence in English. It seems clear that there might be some interesting differences here that are important at some level, however they would not involve the characteristics covered by Katz's base level $\boldsymbol{K}$ in terms of which $\boldsymbol{T}$ was defined (see §3) but rather higher levels on Katz's hierarchy, especially $\boldsymbol{K_4}$. In terms of non-Katzian theories of formal semantics, there would not be a difference in the truth conditions of the two sentences. Therefore, what differences there may be between the two sentences would not be of consequence for purposes of translatability. In any case, no matter what semantic theory one endorses, requiring as a condition on successful translation that both speakers have the same casual relation to a concept seems far too restrictive of a condition on successful translation, as it would rule out translation even between very closely related languages (e.g., old English and modern English), and indeed would call into question communication within a speech community as well (e.g., when a layman reads an article about neutrinos).

system (Keenan cites Hale 1975 on this point). This makes it at least questionable whether the English sentence

(2.1) The cube root of ten is not a rational number.

could possibly be translated into such a language (Keenan 1978:174). Enough of the relevant concepts involved in the meaning of such a sentence are not labelled by a lexical item in the TL that analysis in that language might appear impossible. Although Keenan concedes that a speaker could learn the relevant concepts and then extend the vocabulary of their language, the point is that translation is bound to fail given the current state of English and the Melanesian language, and so, in our terms, translatability only obtains at $\boldsymbol{E_1}$.

It is also worth considering exactly what would be involved in such an extension. It would make little sense to imagine importing words for concepts such as *rational number*, *cube root* or even *ten* into a numberless language in isolation. Rather, a vast number of other lexical items labelling mathematical concepts are needed in order to support these additions. For instance, to have *rational number* in a language, we need a means of expressing *integer*, *quotient*, *fraction*, *numerator*, *denominator*, and so on, a very long list. Notice that these are essentially the same observations made earlier about the classic example of adding *neutrino* to a "jungle language". Simply adding such a term by itself makes little sense without also adding a large number of other terms, beginning with *particle* and *mass*. What these examples point to is that even adding open class vocabulary to a language might represent a major operation if the resulting extended language is to form a coherent system. A "Katzian" might maintain that such extensions would always be possible in principle, as in the thought experiment involving English/Island translation (§5). Of course, if the practical difficulties in such cases were great

enough, some may take this as an indicator that E_0 might be a more interesting level for defining T.

Although Keenan's argument concerning (2.1) seems highly intuitive, it is in some ways not as strong as it first appears. We must consider the general problem that faces claims of untranslatability, which is that any NL can generate an infinite number of sentences. There is no way to prove that some as of yet unconsidered TL sentence will not contain a phrase that expresses the meaning of the recalcitrant lexical item. Thus, it is a difficult task to show that two languages are at $\boldsymbol{E_1}$, as opposed to $\boldsymbol{E_0}$, given the possibility of paraphrase and analysis, and the best be done in most cases is to offer inductive evidence in this respect.

It should be reiterated that there is no stipulation that a translation be natural, or that it be similar in length to the original SL sentence. For instance, in the case of (2.1), an idealized translator might, in theory at least, take advantage of some way that the TL designates a single entity, which could be combined with repetition to capture the successor function and thus define the entire range of natural numbers. From there, irrational numbers could be defined in terms of Cauchy Sequences, Dedekind Cuts, or some other method of obtaining the irrationals from the natural numbers. Eventually, a semantically equivalent translation of (2.1) might be arrived at. That such a translation would be incredibly long, tedious, and not all suited for any practical use is not of concern, what is important is that the resources of the TL can support such a process[73].

[73] To reiterate a recurrent theme, it may be wrong to say that in these cases the TL is, by itself, supporting these processes. A better description may be that the language is being supplemented by extralinguistic resources (certainly through the use of symbols, and possibly by concepts from beyond those available in language, such as the ability understand abstract concepts of physics). This is a hint that, as indicated in the introduction, the entire question of translatability, posed in terms of what languages can express, may be ill-formed, and the distinction between this hypothesis and communicability is difficult to maintain. The resources that a speaker has access to extend far beyond those of the language itself, but these resources are also intractably intertwined with the language proper (and, of course, as indicated in the introduction, making sense of this will require a better

In fact, at least the first step of this process has been observed in exactly the situation under discussion! Wierzbicka observed, in commenting on Everett's work on Pirahã, that

> Many languages lack numerals, and, as the Australian experience shows, their speakers can readily borrow or develop them when they need them. (Wierzbicka, in Everett 2005:641).

The borrowing of an English based counting system by the Australian Warlpiri, speakers of a numberless language, is reported by Hale (1975, the source cited by Keenan). It seems that when the Warlpiri became well integrated into the Australian money economy, they simply imported the entire English system for talking about the natural numbers, as well as the vocabulary for arithmetic. But, even prior to this, he noted that the Warlpiri would use the singular and dual determiners from their own language in order to specify numbers, a method that is theoretically without any limit[74]. Analyzing the crosslinguistic data, Hale's conclusion is that although numbers are far from a universal property of languages, the ability to count is (although Everett has challenged this conclusion, see Frank et al. 2006). Being able to count is still far short of the capacity to discuss irrational numbers, but it suggests that such a capacity may be attainable. It has been argued that, given the terms for "one", "two" and "many" that "all other numerals, quantifiers and counting practices can be developed" (Wierzbicka in Everett 2005:641).

Of course, some may doubt that such analyses of difficult mathematical concepts in languages with a limited vocabulary will always be possible, even in an idealized and theoretical sense. Essentially, the entire question of translatability at the $\boldsymbol{E_0}$ level comes down to the limits

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definition of language). However, the topic at hand is an exegesis of the Katz-Keenan debate, so these important considerations will be shelved for the moment.

[74] "Tjinta" is the Warlpiri singular determiner and "tjirama" the dual; three is "tjirmakari-tjinta, four is tjiramakari-tjiramakari", and so on. Although the technique is unbounded, practical limits are rapidly reached. (Hale 1975:296).

of such a procedure. Although this is an important point, it is far too large of and intractable of a topic to arbitrate effectively in the limits of this dissertation. In any cases, such cases are rarely discussed in the literature, since it is generally accepted that the proper level to discuss translation is at level $\boldsymbol{E_1}$[75].

There are some further issues here that should be addressed. One point is that very long translations that exploit existing vocabulary, such as that discussed above for (2.1) into Warlpiri, will almost certainly fail to preserve the presupposition/assertion dichotomy which is present in the original SL sentence. For instance, (2.1) takes a vast amount of mathematics for granted, information that would need to be painstakingly spelled out in the sort of analysis-based translation suggested. The English sentence (2.1) is true if and only if the cube root of ten is not a rational number. The hypothetical translation would include an enormous conjunction of mathematical facts, all of them asserted as true, which are merely presupposed in the English sentence. It does not appear as if this mismatch in truth conditions can be avoided, suggesting that $\boldsymbol{T}$, at least as defined by Katz, is already encountering some difficulty here.

There are also lexical counterexamples, some of which will be discussed in the next chapter, that have more immediate traction. When the lexical gap involves closed-class items, the possibility of paraphrasing away the gap in terms of existing vocabulary might be less certain. In

[75] One may well question at this point whether a sharp distinction can be drawn between the two levels of $\boldsymbol{E_0}$ and $\boldsymbol{E_1}$. When one considers a hypothetical translation that relies extensively on new uses for existing vocabulary, like the proposed translation of (2.1) into Warlpiri, familiar lexical items are being used in ways that are so novel and unfamiliar that this may seem to amount to the same thing as adding new words to the language. The editors of the Oxford English Dictionary make no distinction between repurposing old words and adding new ones. For instance, a new use for the word *tutorial*, as a short video instruction on the internet, is counted fully as one of the 700 new words for the first half of 2021, along with entirely new words such as *amicus*, an impartial adviser in a legal proceeding (https://public.oed.com/blog/the-oed-june-2021-update/). For present purposes, I will continue to make this distinction, since Katz and Keenan did so. Notice that this consideration also leads directly into the considerations raised in fn 48, and I will return to this problem as well in Chapter IV- but also note that, once again, any such distinction is essentially meaningless in the absence of a clear identity criteria for a language and its lexicon.

the most interesting cases, such a gap combines with syntactical features of the TL in order to definitely rule out some of the most obvious strategies for analyzing away the problem. These are among the strongest counterexamples not only to Katz's ***T***, but to any translatability thesis that might be defined non-trivially. Other cases involve situations in which some closed classes have semantically significant differences between SL and TL, or where an entire category of functional items (e.g., future auxiliaries, see next chapter) is missing from the TL. These differences create a number of translatability issues, including particularly clear cut cases where presuppositions are not preserved, and sometimes deeper failures.

§6.2 Syntactical Counterexamples

Keenan argued that another category of counterexamples can be defined because "operations which form complex structures from simpler ones" vary widely between NLs, and the syntax of some languages bar constructions permissible in others (Keenan 1978:174). This can amount to semantically significant differences in cases where no alternate construction with the same semantic properties is available in the TL. Such a difference in the semantic range of languages would, of course, present a counterexample to ***T***, one more secure than those based on lexical differences because it would represent a gap in the expressive power of the TL that could not even in theory be overcome by conceptual analysis or the introduction of new vocabulary.

For instance, languages differ in their ability to express passive constructions. Several Chadic and Melanesian languages have nothing corresponding to English passive voice sentences; they cannot construct the equivalent of "Mary was given the book by John". Conversely, most Malayo-Polynesian and Bantu languages permit passives to be formed on any noun present in the basic sentences. An example (not from Keenan) comes from Bikol, spoken in

the Philippines (Givón 1978:262). English cannot form a passive on "store" in (2.2), while this is acceptable in Bikol:

(2.2) d-in-uman-án kang-lakáke ?ang-tindáha

LOC-go AGT-man TOP-store

The man went to the store.

(2.3) na-duman-án kang-laláke ?ang-tindáha

LOC-go AGT-man TOP-store

*The store was gone to by the man.

Keenan argued that passivation is a semantically significant operation: subject phrases have a wider scope than non-subject phrases, so changing a non-subject into the subject of a sentence gives it a different scope and can possibly alter the truth conditions of the sentence. By way of illustration, he gave "every boy kissed a girl" and "a girl was kissed by every boy", whose truth conditions are different, at least on the preferred readings (Keenan 1978:165). Therefore, the different abilities of languages to form passives indicates that "languages can vary with regard to the distribution of semantically significant operations" (Keenan 1978:165), although he unfortunately does not provide any specific cross-linguistic cases.[76]

[76] Katz only very briefly discusses passivation (1978:227), noting that "Whiskey is drunk by the boy" fails at $\boldsymbol{K_2}$ to be synonymous with "The boy drank whiskey", that is, the surface structure is not preserved even though all the semantic ($\boldsymbol{K}$) properties are. He never addresses whether the passive form of a sentence could potentially differ in semantically significant ways from the active form, i.e., whether it could differ at $\boldsymbol{K}$.
It is worth noting that if Keenan's examples, "every boy kissed a girl" and "a girl was kissed by every boy" are taken to have more than one meaning beyond the preferred reading, then they are synonymous by Katz's criteria, which require only that synonymous sentences share a single sense. A clearer example of a sentence whose meaning is certainly changed by transformation to the passive voice is the following (adapted from Chomsky 1795a:31): "Fools like me write poems", "Poems are written by fools like me". A reading on which the two sentences have identical truth conditions would certainly be strained.

Another example comes from Malagasy and Tagalog, Austronesian languages which are very restricted as compared to English in the construction of relative clauses[77], and are unable to form the equivalent of "the man who John saw" (Keenan 1978:165). Hebrew, Welsh, and Persian, on the other hand, allow relative clauses on a broader range of syntactic environments than English. A Hebrew speaker can relativize on the noun for "man" in the Hebrew for "the dog that bit the man belongs to Harry" to form an expression roughly equivalent to * "the man that the dog that bit him belongs to Harry" (Keenan 1978:165). Keenan argued that interlinguistic differences in relative clause formation at times have semantically important effects (an example drawn from English and Hebrew that figured prominently in the debate with Katz will be discussed in the next subsection).

Keenan's case in these examples rested essentially on the claim that these, and similar, syntactic operations can transform basic, or what are sometimes called *kernel*, sentences into new, more complex sentences that differ from the basic one in semantically significant ways. Because languages differ in what transformations are allowable, they sometimes differ in their expressive ability at the semantic level, and thus, Keenan maintains, provide counterexamples to $\boldsymbol{T}$ at Katz's base $\boldsymbol{K}$ level of translatability. In so far was Katz responded to counterexamples, his tactic was to argue that, in each case, some other construction is available in the TL that would relay the same semantic contents (similar to Sapir's assertion that every language contains a "formal pattern" adequate to every thought, §1.1), and that the differences therefore are syntactical ones, at the level $\boldsymbol{K_1}$, and thus do not represent violations of $\boldsymbol{T}$. Some specific cases are discussed in more detail below and in the next chapter.

[77] A relative clause is a clause which, in English, begins with *who*, *that*, *which*, *whose*, *where* or *when* and serves to identify the preceding noun phrase, e.g., "the city *where I live*".

It should be noted that this focus on the base level, ***K***, of Katz's hierarchy explains why there is no discussion here of sentences that are often held to be untranslatable when they are used in a non-literal sense, for instance as part of a joke, pun, or poetry. In these cases, the quality lost in translation belongs to the higher levels of Katz's hierarchy, and thus they cannot be counterexamples to ***T***.

§6.3 Entailments and Presuppositions

All of Keenan's detailed counterexamples turn on the preservation of entailment relations[78], and in particular on the possibility of preserving under translation the way that the SL sentence in question divides entailments into presuppositions and assertions. This has remained a common motif in the literature, and von Fintel and Matthewson in particular would continue on this theme (Matthewson 2006; von Fintel and Matthewson 2008, see Chapter III, §2). This may seem to be an oddly narrow focus, but Keenan regarded concentrating on this specific aspect of translation as a way to bypass particularly difficult questions about how to precisely define slippery notions such as *meaning* and *synonymy* (Katz clearly had no such reservations about defining difficult concepts).

Keenan began by examining the generally agreed upon assumption that for two sentences to have the same meaning, and thus be synonymous, a necessary (if possibly not sufficient)

[78] *Entailment* is being used here in the sense of Katz's semantic entailment, e.g., entailment by meaning, as opposed to through logical laws (see §3), and this is how it is standardly used in this dissertation (outside of Chapter I, of course). The term which Keenan (1975b,1976,1978) actually used for this relation is *inference*, which is undefined but seems to be used more or less equivalently to Katz's notion of semantic entailment. Interestingly, the first time that Keenan engaged Katz on the topic of translatability (Keenan 1974) he did use the term *entailment*, which he explicitly identified with the logical notion: "Entailment then is clearly a [natural language] semantic relation…the definition captures the following informally stated intuition: one sentence is entailed by another if (and only if) it is true in every state of affairs in which the other is true" (1974:188). Ironically (since Keenan was known for work on the differences between formal logic and natural language (Happlesmath 2012)), he did not notice the issues that might arise from using this definition (e.g., with complex tautologies and so forth) in the analysis of synonymy and translation. It seems likely that he realized there were complications here, because in his further exchanges with Katz he switched to the less formal term *inference*.

condition is that they share the same truth conditions. Upon reflection, the identification of meaning with truth conditions often proves deceptively difficult to apply. Keenan argues that (1978:168, italics in original)

> While this criterion is easily agreed upon in principle, its application in practice is sometimes problematic. For one thing we often do not know exactly what the world must be like for (utterances of) simple sentences to be true (e.g., *John loves Mary*). But we do often have indirect access to the truth conditions of the utterances in terms of the inferences they justify. Thus, while we are no clearer about the truth conditions of *John does not love Mary* than we are about those of *John loves Mary* we can unequivocally assert that their truth conditions are different since only the later justifies the inference *someone loves Mary*.

Keenan's point here seems to be that *loves* is a somewhat vague predicate, and we are generally unsure how to stipulate exactly what state John must be in for this sentence to be true on a particular use. But the relation of entailment between sentences is not subject to such a concern. However we define the extension of "loves", or even if we leave this problem unsolved, we are still sure of the inference from "John loves Mary" to "someone loves Mary".

The entailments of a particular sentence S can be divided into two categories (Keenan 1974). Assertions are sentences which must be true in order for S to be true. Presuppositions are sentences that must be true in order to for the use of S to be appropriate in a particular context, that is, for S to be sensibly evaluable as either true or false[79]. As a rough guide to identifying the

[79] Of course, the exact nature of presuppositions is highly controversial. Von Fintel and Matthewson (2008:178, fn), drawing on Beaver (1997), note that "[W]hile there is no single definition of 'presupposition' that will satisfy everyone, there is at least an accepted set of basic data which we agree are covered by the term". They define presuppositions "theory neutrally" as "aspects of meaning …[that] are not asserted, but somehow taken for granted…impose some constraints on when an utterance is felicitous, and…project through certain entailment-

difference, an assertion which is known to be false normally causes a listener to challenge the truth of an utterance, while the failure of a presupposition usually elicits what has been termed a "hey, wait a minute" response (von Fintel 2001). Suppose that *A* points to someone and says to *B*:

(2.4) That is the man who stole your wallet.

If *B* knows that, in fact the asserted content is false, that the person *A* is pointing to did not steal her wallet, she may simply respond:

(2.5) No, that's not him, you are mistaken.

But in the case of a presupposition failure, for example, if no one had stolen *B*'s wallet in the first place, that response would typically be considered infelicitous (marked by a #). More fitting would be something like:

(2.6) What are you talking about?

Keenan offered, as an initial demonstration of how presuppositions might pose a problem for ***T***, the following Hebrew sentence (Keenan 1974: 195):

(2.7) Zot ha-isha she-ami makir et ha-ish she-natan la et ha-sefer

That is the woman that I know the man that gave to her the book

Keenan argued that (2.7) is not translatable into English, at least not in a way that would preserve the assertion/presupposition division in the Hebrew. The relative clause of (2.7) is itself a full sentence and retains a pronoun, *la*, referring back to *ha-isha*, "the woman". Since English cannot

cancelling operators" (2008:178). To avoid entering into the debate on the nature of presuppositions any further than necessary, I will stay at this level of generality, which is sufficient for the purpose at hand.

have pronouns in relative clauses that refer back to the matrix, Keenan argues that (2.7) cannot be translated into English, as a clause containing the same information would be ungrammatical. The closest possible literal translation would be

(2.8) *This is the woman that I know the man that gave a book.

which is both grammatically unacceptable and difficult to understand as expressing the same point as the original. The only option that Keenan views as acceptable is to translate as a conjunction, such as

(2.9) I know a man that gave some woman a book and this is that woman.

But (2.9) asserts that "I know some man…" as one of its conjuncts. This information is presupposed in (2.7) rather than asserted. If a listener knew that it was false that the speaker "knows a man that gave some woman a book", they would likely give a "wait a minute" type response to (2.7), while they would be justified in directly challenging the truth of (2.9). Any such translation, in which a presupposition of a simple SL sentence becomes one conjunct of a TL conjunction is asserting something that is presupposed in the original. Keena concludes that (2.7) has no exact translation into English, demonstrating that all languages are not identical in expressive power.

Katz (1976:40) responded to this challenge with three translations:

(2.10) This is the woman such that she was given a book by the man I know.

(2.11) This is the woman who received a book from the man I know.

(2.12) This is the woman who was given a book by the man I know.

Katz feely admitted that these are somewhat unnatural English sentences, but reiterated that ***T*** concerned semantic contents only, the properties and relations in ***K***, not preservation of style. If these translations are acceptable, and they seem to be, since they are grammatical, capture the proposition that (2.7) is trying to communicate, and preserve the semantic relations, including presuppositions, of (2.7), then the only difference between the Hebrew and English sentences are syntactical, concerning the construction of subordinate clauses. All parties to the debate agreed that preservation of syntactical structure is not a necessary condition for successful translation at the most basic acceptable level[80].

While Katz may have been able to answer this particular challenge, there remain numerous examples along the same lines, many of which cannot be so easily answered. Both Katz and Keenan acknowledged that entailment relations must be preserved for successful translations, Keenan for the reasons just discussed, that the entailments of a sentence are an indirect indicator of its truth conditions, Katz because entailment relations are a part of the set of semantic properties ***K***. Further, they were in agreement that the division between assertions and presuppositions present in the original SL sentence must also be preserved in the TL. At a first look, this may seem like a minor, almost trivial, stipulation to spill so much ink over. Yet, it is actually far from arbitrary, as semantic behavior differs between the two categories of entailments.

First, of course, there is the important consideration that the overall consequences of false entailments are very different depending on what flavor of entailment the false proposition represents. When an assertion entailed by some sentence *S* is false, *S* itself is false. But if a

[80] Matthewson and von Fintel (2008) argue that the presuppositions of (2.7) are not preserved: Katz's translations all use the phrase "the man I know", presupposing that the speaker *knows* a unique man; (2.7) presupposes instead that a unique man was the giver of the book.

presupposition of *S* is false, then *S* is not true or false, but rather infelicitous or anomalous. Conversely, if *S* itself is false, then the propositions that it asserts are also false, while presuppositions remain unchanged in their force. Likewise, with negation: assertions are cancelled under the scope of a negation while presuppositions are not. For instance, compare (2.4) to (2.13):

(2.4) That is the man who stole your wallet.

(2.13) That is *not* the man who stole your wallet.

The assertion of (2.4) is clearly cancelled by the addition of the negation in (2.13), but the presupposition, that the wallet was stolen, remains in force.

More generally speaking, presuppositions have the property of *projection*- they retain their original force, even when they occur in environments that cancel other entailments. This can be observed in the antecedent of a conditional, as part of a yes-or-no question, or under the scope of an attitude verb. Compare the following conditionals:

(2.14) If he is drinking water, he will stay hydrated.

(2.15) If he stops drinking water, he will become dehydrated.

In (2.14) the proposition *he is drinking water* is completely hypothetical, contained as it is in the antecedent. In (2.15) the very same proposition is presupposed, as signaled by the "trigger" word *stops*, and so is an entailment of (2.15) even though it is in the antecedent of the conditional.

It is uncontroversial that information that is presupposed in the SL, if it cannot be expressed as a presupposition, can generally, perhaps always, be directly asserted in the TL.

Keenan himself provided an example of this procedure with (2.9). The claim is that, even so, when this is done something has been altered about the semantic properties of the SL sentence.

At a more intuitive level, consider:

(2.16) Did you quit smoking?

If the best available translation into a hypothetical TL would be literally translated back into English as

(2.17) You smoke. Did you stop?

It would certainly seem that explicit accusation is being introduced into the translation which is only suggested in the original.

So, it might be concluded that while a failure to preserve the SL division between presuppositions and assertions might not be as serious of a defect as failures at a more basic level, e.g., not preserving entailments at all or having different truth conditions altogether, there is a real sense in which exact translation does not obtain under these conditions. This means that there should be an interest, for anyone investigating questions of translatability and its exact limits, in cataloging these sorts of cases.

At the same time, it should apparent fairly quickly that anyone seriously maintaining that the presupposition/assertion division can always be maintained under translation, for all sentences, between all languages, has their work cut out for them to establish this proposal, or even to defend it as a serious possibility. Even a quick glance at a limited range of comparative linguistic data reminds us that, as Jakobson had pointed out, languages differ critically in the information that they *must* encode. For instance, the determiner system of some languages

respect a definite/indefinite dichotomy while others do not make this distinction. The English definite determiner *the* is a presupposition trigger which signals that the referent of the following noun phrase is either unique in context, already familiar to the interlocutors, or otherwise salient somehow. But if an English sentence containing *the* is translated into a TL without a definite determiner, there is typically no other way to convey this information but to assert it. This issue (a concrete example involving determiners will be discussed in the next chapter, §2.1) is only one instance chosen to illustrate the fact that what sorts of lexical items are presupposition triggers will vary dramatically from language to language.

This raises the question of why Katz would not simply concede, in the face of the evidence, that the presupposition/assertion division cannot be preserved in every case. He had already allowed that some other, albeit non-semantic, properties (e.g., connotations or rhyming elements) might not always be preserved between some pairs of languages. This concession would have signaled a weaker interpretation of ***T*** than the one that Katz advocated, but would have still left a theory which was strong enough to be interesting, and which would certainly be more easily defensible[81]. Instead, Katz's actual response was to provide counter-counterexamples such as (2.10-2.12) to a few cases, and to argue that in *every* case some such construction would be available in the TL that would serve as an exact translation, with all and only the presuppositions of the original. It is explicit that he regarded the preservation of presuppositions as a critical test of ***T***, and therefore also ***E***:

> If what Keenan claims...were true, effability would have been refuted, and this illustrates a relevant empirical test for effability (Katz 1978: 222, discussing the case of (2.7))

[81] Consider Jakobson, who, unlike Katz, did not give an exact definition of *translation,* recall that he discussed the difficulty of translating between languages whose grammar made obligatory the encoding of different types of information, e.g., number, gender, familiarity to the interlocutors, and so on. The example translations that he presented (see §1.2) leave little doubt that what he had in mind was some such weaker version of ***T***.

Although he gave little direct indication, we might extrapolate both from evidence internal to his theory of translatability, and from his general philosophy of language, why Katz defended such an apparently difficult to motivate position. But it should also be kept in mind that Katz regarded ***E*** as a consequence of the general "rationalist" theory of language that he had derived from Chomsky, which goes some way towards explaining why he defended ***T*** so staunchly.

The definition of ***T*** (see §0) requires that "If two sentences are translations, they have the same semantic properties and relations" (Katz 1978: 221). Semantic properties are all and only the members of the set ***K***, and it is explicitly noted that entailment is a member of this set (Katz 1978: 205). Then, as it is initially stated, ***T*** requires that all the entailments of the SL sentence be preserved in the TL equivalent, but it is not clear from this definition that the presuppositions must be preserved as presuppositions and assertions as assertions (e.g., it is not obvious that 2.9 would not be an acceptable translation of 2.7). However, we might extrapolate this from the way that Katz initially defined entailment, with separate clauses for entailments triggered by presuppositions and those triggered by asserted content (1972:188, see §3). **I**ndeed, he went on to note that he understood ***T*** in the same way that Keenan did, in terms of exact translation, and as a consequence

> [F]or any two sentences of different languages to be exact translations of each other they must be semantically related to other sentences of their respective languages *in exactly the same way* (Keenan 1974: 193, italics added, quoted in Katz 1978: 221).

Apparently, *exactly the same way* is to be understood as preserving the presupposition/assertion division. This is a sensible interpretation of Katz's Principle of Translatability, ***T***, which as defined using the set ***K***, required that all semantic relation with other sentences be preserved exactly. As discussed above, assertions and presuppositions differ in semantically significant

ways. Therefore, preserving them would be required for successful translation under ***T***, at least as the principle is defined by Katz.

It also seems that the requirement that the presupposition/assertion division be preserved is entailed by Katz's underlying philosophy of language and his specific development of formal semantics, which draws no distinction between logic and language. Katz does draw a line between inferences that are licensed by semantics and those that are a consequence of logical laws. However, this is merely a way of categorizing the source of the inference, analogous to the difference between implication due to sentential connectives and that due to quantifiers, rather than of separating two entirely different sorts of implication as with, say, inductive and deductive reasoning (Katz 1972:187, see also §3)[82]. On this theory, then, semantic entailment is a type of logical relation that licenses validity and logical consequence, and for instance, the argument "Socrates is a man, therefore Socrates is male" is a valid argument in the sense that the premises cannot be true and the conclusion false.

The considerations of the previous paragraph should make it immediately apparent why having exactly the same presuppositions should be a requirement for two sentences to be synonymous. On Katz's view of logic and language, synonymy, which subsumes the relation *translation of* as a special case, is a logical relation, the natural language analog of equivalence in formal logic. Therefore, it follows that synonymous NL sentences must have the same semantic entailments, that would play the same role in patterns of inference. As discussed previously, the force of entailments differ based on whether they are presuppositions or assertions. If an assertion of ***S*** is false, it follows that ***S*** is false, while if a presupposition of ***S*** **i**s false, ***S*** is

[82] Note that this position is the opposite of Quine, always Katz's foil, who argued throughout his career that logical relations between sentences are defined only in terms of specific logical vocabulary, i.e., the words which are symbolized as logical operators (Quine 1970).

anomalous, neither true nor false. In addition, presuppositions project through operators which cancel assertions. It follows that two sentences with different presuppositions cannot be logically equivalent, and therefore cannot be synonymous. For example, (2.9) cannot be a translation of (2.7) and (2.16) cannot be translated by a sentence whose literal meaning is (2.17).

Therefore, we can see why the requirement for assertions and presuppositions to be preserved follows from ***T***, as it was defined by Katz, in terms of ***K***, especially given Katz's other philosophical commitments. There remains a question of why he would regard ***T*** as an even remotely tenable hypothesis, in the face not only of Keenan's specific counterexamples but given that it is shown to be inherently implausible by even a quick glance over the crosslinguistic evidence. Here, we can be less certain of his what was motivating him to propose and defend at length such a strong claim, rather than backing down and proposing a weaker version of the principle.

As a matter of general intellectual history, it can be noted that Katz had a reputation as a particularly stubborn individual who would rarely admit that he was in error. As far as his own words on the matter, we have only one brief passage. Katz responded specifically to two of Keenan's counterexamples, (2.7), and a case drawn from Hopi. This Hopi example will be discussed in more detail in the following chapter (§1.2). Relevant to our current purpose is the Hopi sentence (Katz 1978: 222)

(2.18) pam novoti:ta (pam) mo:titani-q

He thinks he win

He thinks he will win.

Here, the suffix *-q* indicates that the expected winner is different from the person doing the thinking. Therefore, (2.18) has none of the uncertainty of its literal English translation, which is given above, where the reference of "he" is completely undetermined[83]. Of course, no such mechanism is available in English, but Katz suggests this translation (Katz 1978: 222)

(2.19) He thinks that some specific male other than himself will win.

In discussing this translation, Katz states (Katz 1978: 223)

> It should be noted that [2.18] uses the grammatical device of, as it were, subtracting from the meaning of an expression to obtain one with a meaning that is neither too broad nor too narrow to be an exact translation of a certain foreign expression. With such grammatical devices in every natural language, arguments for differences in expressive power between natural languages face the extremely difficult task of attempting to show that no such device in combination with additive devices can produce the exact translation that such arguments deny. It is not even clear how to argue for the existence of expressions that such devices cannot zero in on.

This passage is highly compressed, given that it carries much of the weight of Katz's argument, and it is far from transparent. By "subtracting from the meaning", Katz seems to be referring to the process of beginning with the word-for-word English translation of (2.18), "He

[83] It is important to note that, for Keenan's argument to succeed in this case, "He thinks that he will win" cannot be taken to be ambiguous between two or more meanings, one in which both instances of "he" co-refer and one in which they do not. This is because synonymy, as defined by Katz, requires that sentences share only a single meaning. This would make "He thinks that he will win" an accurate translation of (2.18), since one sense of the English sentence would be identical to the proposition expressed by the Hopi sentence. But Katz does not press this argument, rather, he seems to accept Keenan's treatment of "He thinks that he will win" as an unambiguous sentence that has "broader truth conditions" than (2.18). Keenan calls such sentences that are not ambiguous but are otherwise not fully specified in some sense "vague" (1978:173), a description which covers almost all NL sentences outside of mathematics. Because ***T*** did not require that translations be ambiguous in the same way as the SL sentence, Keenan had to establish for many of the counterexamples that he presented that they could not be regarded as cases of ambiguity. His arguments to this effect, some of which will be discussed in Chapter III, succeed to varying degrees. Indeed, there are reasons to disagree with this conclusion as regards (2.18), but the discussion is rather lengthy and so will be put aside for when we revisit this case in the next chapter.

thinks he will win", which is indeterminate in the sense that the two uses of "he" may or may not be co-referential, and then transforming the sentence as needed to arrive at (2.19). The procedure is one of starting with a sentence that is true under a wide range of conditions, and then "subtracting" some of those conditions to obtain a sentence whose truth conditions are appropriately narrow. The "additive" technique must then be the reverse, of beginning with a sentence that is true only under a narrow range of circumstances and altering it to arrive at a sentence that is true given a broader range of possibilities.

Katz asserts in the quoted passage that every natural language has such devices, which is almost certainly true. What are more dubious are the implied claims that (i) these devices are evenly distributed across NLs, and will suffice in every case, and (ii) the assertion in the final sentence that it is not clear how one might argue that they will not be sufficient in some cases. Both of these are empirical claims, and Chapter III will present a number of examples demonstrating not only what such arguments might look like, but that (i) is certainly false, at least as far as presuppositions are concerned.

In fact, at the point where Katz makes the quoted claim, he had just finished discussing two of Keenan's counterexamples, from Hebrew, (2.7), and Hopi, (2.18), which, whether they happened to succeed or not, demonstrated, against claim (ii), the form such arguments might take. These sentences allegedly trigger presuppositions by means not available in English; Keenan calls such features *presupposition structures* (Keenan 1974:198). While Katz found an acceptable translation to (2.7) and took himself to have found one for (2.18) (although this claim seems to be incorrect as we will see when we return to this example later), this at least demonstrates what a counterexample would look like. Katz dismisses these claims as unrelated to semantics (Katz 1978: 223, note the interchangeable use of "logical" and "semantic"):

> The fact that our translations of Keenan's sentences are not syntax preserving does not make them any the less exact translations. Translations, as Keenan's own notion makes clear, has to do exclusively with semantic relations…. Keenan's mistake, as I see it is a confusion of the logical notion of translation with other, non-logical notions…

However, Keenan's point, which Katz seems to be glossing over, was precisely that some properties of meaning- in these cases, presuppositions- can be dependent on syntactical features. Because the comparative study of grammar allows the comparison of what sorts of constructions are allowable in a given NL, these arguments are relatively straightforward to evaluate, at least in so far as anything in the area of translatability is ever straightforward. We will examine many more such examples shortly.

I will conclude this section by noting that although Katz's particular views on language commit him to a view of ***T*** as preserving the presupposition/assertion division, we are under no such obligation. We might easily define a weaker thesis:

> (***T'***) For any pair of natural languages L_i and L_j and for any sentence S in L_i, and for any sense σ of S, there is at least one sentence S' in L_j such that σ is a sense of S'. Let the *sense* of a sentence be defined in terms of properties and relations contained in a set ***K'***, which includes all semantic properties, and all semantic relations *with the exception of the division of entailments into presuppositions and assertions*, i.e., entailments must be preserved, but it is not required to preserve presuppositions as presuppositions and entailments as entailments.

One way of sharpening this definition might be to do away with, for these purposes at least, the dichotomy between presuppositions and assertions in the manner of Russell (1919). Of course, Russell's views are not universally accepted, but this need not

prohibit using such a theory of presuppositions for defining *T'*. What is important is that whether ***T'*** holds is an intelligible question, and one that is separate from whether ***T*** obtains. As noted earlier, something like ***T'*** seems to be what Jakobson had in mind, and this is most likely true of other proponents of translatability, such as Baker, Sapir and Frege, as well.

I will refer back to this definition at times in what follows from this point. Obviously, there are many counterexamples to ***T*** which are not problems for ***T'***. Counterexamples to ***T*** are relatively numerous, and although their target, Katz's position, quickly falls apart, they are still of interest primarily for the purposes of tracing the limits of exact translation between NLs. This process in turn provides data in the search for semantic and pragmatic universals, shared by all human languages, as well as in identifying semantic parameters analogous to the syntactical parameters of generative grammar (see, for example Matthewson 1998, 2006). Counterexamples to ***T'*** are much rarer but of even deeper interest.

At this point, we have set the stage for considering specific counterexamples, which will occupy the next chapter.

Chapter III: Case Studies, Data and Counterexamples

"Translations are a clue, not a result."
(Matthewson 2004a:391)

§0. Introduction

Now that we have, in the previous chapter, defined the essential vocabulary and staked out the major positions in the discussion, we are ready to look at some specific cases which have been proposed as counterexamples to Katz's ***T***, specifically, or to the claims of other authors such as Jakobson who expressed similar proposals[84]. Some of these challenges would also constitute counterexamples to the weaker ***T'***, defined at the end of the last chapter. This is not meant to be an exhaustive list, but rather a discussion of some of the most interesting and relevant work.

The first section will examine in greater detail some of Keenan's arguments against Katz. Keenan's focus was on situations where the division of a sentence's entailments into assertions and presuppositions cannot be preserved under translation. These examples are drawn a wide range of languages, and they vary in the degree to which they are convincing. §2 covers more work on the theme of presuppositions, drawn from field research on the Salish languages of the Pacific Northwest (primarily Matthewson 1998, 2006). In this body of work, the claim that no presupposition-preserving translation is available receives extra support from dramatic differences between Salish languages and English in the role that presuppositions play in discourse.

[84] As a quick reminder, *T* is, in informal terms, the hypothesis that for every sentence of every natural language there is a synonymous sentence in every other natural language (see page 30 for full definition). ***T'*** is a similar but slightly weaker position that does not require the division of assertions and presuppositions be retained for synonymy (see page 85).

§3 discusses evidence from Nez Perce that has been represented as a direct challenge to ***T*** (Deal 2011,1015). The modal system of the Nez Perce language is reported to contain an expressive gap relative to English. As a result, some English sentences containing modals have no equivalent in Nez Perce with the same truth conditions. This is a gap that cuts deeper against the idea of universal translatability than a failure to preserve presuppositions, and due to some particular features of Nez Perce syntax it cannot be easily filled paraphrased away. Next, §4 will discuss the work of Bittner (2005) on the Kalaallisut language, which is reported to be tenseless in a very strong sense, so that speakers have no direct way of discussing future events. Although not originally intended as a contribution to the translatability debate, Bittner's data is drawn from a detailed study of translation from English into Kalaallisut and suggests a significant challenge for ***T***. Then, §5 will briefly examine some further cases in the literature. First this section will discuss languages without relative directional terms, such as left and right, a lacuna which has been claimed to engender untranslatability relative to languages that have such vocabulary (Bloom and Keil 2001). Following this will be a look at some cases of languages that are reported to not have any way of expressing the basic vocabulary of classical logic, such as quantifiers and sentential connectives.

§6 will concern one of the best known and most widely discussed cases, that of the Pirahã language, which has been described by Everett (2005) as largely untranslatable relative to English as either source language (SL) or target language (TL). The wider body of work in which these claims were presented has been subject to heavy criticism. This criticism will be discussed in so far as it concerns the claims of untranslatability, and it will be seen that while Everett's claims are intriguing their ultimate status is unclear.

§7 will conclude by briefly summarizing the information presented in this chapter before moving on to the more philosophically oriented Chapter IV.

§1 Keenan's Counterexamples

The previous chapter introduced Keenan (§4) and outlined his broad objections to ***T***. We then (§6.3) looked at the specific way in which he built his case, which was based almost entirely on situations in which the exact divisions of the SL sentence's entailments into presuppositions and assertions cannot be reproduced by any TL sentence. We examined one specific counterexample, a Hebrew sentence whose presupposition structures depend critically on a relative clause which cannot be formed in any grammatical English sentence. Although Katz may have had a legitimate response to that particular alleged counterexample, it is very difficult to see how a response might be found to *every* such case. Keenan detailed several other instances; these vary somewhat in their plausibility but at least one seems to be as solid a counterexample as might be hoped for, given the difficulties attendant on interpreting the data. Keenan conceded that it is impossible in most cases to rule out some, as of yet unconsidered, sentence of the TL which provides an acceptable translation, but maintained that it was attainable to identify cases in which the syntactical differences between SL and TL would make this very unlikely. The identification of many classes of such cases would indicate that ***T*** has a very low degree of inductive probability, and therefore the hypothesis should be abandoned. We turn now to an examination of some cases, drawn from Keenan (1978), arranged in no particular order but intended to give the overall flavor of Keenan's argument.

§1.1 Malagasy relative Clauses

An example, similar in many respects to the case from Hebrew discussed in Chapter II (§6.3), concerns the construction of relative clauses on noun phrases (NPs) which are the object of a verb or preposition, called *oblique case NPs* (Keenan 1978:178-79). English sentences may contain relative clauses that are formed on oblique case NPs and which give location information, but these sentences cannot be directly translated into some languages such as Malagasy or Tagalog with losing the exact specification of the location. For example, while "John put the basket under/on top of the table" can be translated into Malagasy without difficulty, things change when a speaker constructs a relative clause on *table*. This can only be accomplished in Malagasy by making *table* the subject and putting in the nominative case, which requires eliminating its prepositions. Compare the following English sentence with "its only naturally elicited translation" in Malagasy (Keenan 1978:179, italics added):

(3.1) The table *under* which John put the basket was damaged.

(3.2) Simba ny latabarta (izay) nametrahan-dRajoana ny harona
Damaged the table that placed-by John the basket.
The table *where* John put the basket was damaged.

Note that in the TL the relative clause is formed without the preposition, so that the exact location where the basket was placed, relative to the table, is not specified by (3.2). Then the two sentences have different truth conditions, since (3.2) is true in many situations where (3.1) is false (e.g., the basket was placed on top of, or next to, the table)[85]. Keenan demonstrated that

[85] Keenan himself never used the term *truth conditions* in discussing translatability, which reflected his stance that the description of a sentence's semantic properties in terms of entailments ("implications") serves as a more

many of the devices that might be available to paraphrase (3.1) into other target languages are not available for Malagasy. For instance, a translator cannot "front the preposition as in the English *under which*" (1978:179, italics in original) because *izay,* the nearest Malagasy equivalent to *that/which,* cannot be combined with a preposition. After considering and rejecting a few such options, Keenan concludes that "there is certainly no way of fiddling with the relative clause to allow the preposition to remain" (1978:179). The best available solution is to dispense with the relative clause and use a conjunction to arrive at a Malagasy sentence that would be back-translated into English as something like (1978:179):

(3.3) John put the basket under some table. That table was damaged.

But, of course, Keenan had objections to the acceptability of such a translation, the form of which should be predictable after the discussion in Chapter II, §6.3. That John put the basket under a table is *presupposed* in (3.1), while this is overtly *asserted* in (3.3). If it is false that John put the basket under a table, then (3.1) is rendered infelicitous or vacuous, and we might expect an addressee to respond with a "wait a minute" response. On the other hand, under such conditions (3.3), or its Malagasy equivalent, would be simply false, and an addressee would be expected to challenge the false assertion. Although there is a clear sense in which the important content of (3.1) is preserved by a Malagasy conjunction equivalent to (3.3)- that a particular table is damaged- the presupposition/assertion division has not been preserved. If Keenan is correct that no better translation is available, this enough to demonstrate a difference between the two sentences at the level of $\boldsymbol{K}$, and thus to constitute a counterexample to $\boldsymbol{T}$.

tractable proxy for truth conditions. At times, however, he did talk about a particular sentence being true in a broader or narrower range of circumstances than another.

Katz did not, at least in print, respond to this particular case, perhaps because he was probably not familiar with Malagasy. However, his likely response would be to insist that some device must be available to allow a satisfactory translation of (3.1) into Malagasy in such a way as to preserve all semantic properties. This translation might be a paraphrase similar to the specific responses which Katz provided to the Hebrew and Hopi cases which he did discuss (Chapter II, §6.3), but with English now as the source rather than target language. Katz had argued that the devices underlying such translations would be available in *any* natural language (NL) (Katz 1978). Indeed, although Keenan had demonstrated that some particular approaches where untenable, it would be very difficult to provide conclusive proof that *no* acceptable translation is possible.

On a close reading, there seems to be a further weakness concerning Keenan's dismissal of a particular translating strategy among those which he did consider, that of inserting the location information as a sort of parenthetical, to arrive at a Malagasy sentence which might be back translated into English as something like:

(3.4) The table where John put the basket- he put it under it- was damaged.

Keenan argues that this would be unacceptable, as "[T]here is a strong constraint in Malagasy against interrupting the stream of speech. Malagasy discourse contains no parentheticals…" (Keenan 1978:179). But one might well question on what level this constraint applies. It seems that Keenan is discussing not a syntactical rule, whose violation would result in an ungrammatical or unacceptable sentence, but rather a norm governing speech that happens to be observed in Madagascar. Although a Malagasy equivalent of (3.4) might be rejected, in normal discourse, as unnatural or bizarre, Katz had reiterated at several points that ***T*** made no

predictions at the pragmatic level, and in fact the best available translations would often be quite unnatural sounding to a native speaker of the target language.

It seems, therefore, that Keenan's particular argument against (3.4) may fail, as it is based on a cultural norm, rather than a feature of the language itself. However, all this may be rather irrelevant, as according to more recent analysis of parentheticals, a Malagasy sentence of a form equivalent to (3.4) would be unacceptable as a translation of (3.1) for the same reason as one equivalent to (3.3). Potts argues that parentheticals, such as in (3.4), are "never backgrounded", and thus "do not meet the main pretheoretical requirements for being presupposed…" (2005:13), and this position is widely accepted.

Another interesting point concerning this case is that, despite Keenan's own assertion that it would reduce $\boldsymbol{T}$ to triviality if a translator could add new vocabulary at will, it is very unclear that this particular gap in translation could be overcome by introducing neologisms to the target language. Rather, assuming that Keenan is correct that there is in fact a counterexample here, English and Malagasy would be at the level E_3 of translatability, since there is a gap that can only be repaired by adjusting the syntax of the target language. In this case, the adjustment would consist of altering the way in which Malagasy forms relative clauses, a move which would no doubt have other effects on the grammar, and which might be considered pretty far outside any normal definition of "translation". Still, it is interesting to note that Malagasy could, theoretically, support such a change (the language could even evolve in such a direction in the normal course of things). This points to something about the relation between English and Malagasy which is certainly not an automatic feature for two systems of communication to share (e.g., FOL and propositional logic, or English and the dance of the bees), and serves to demonstrate the underlying unity of human NLs (see Chapter II, §5). In fact, this consideration

should be kept in mind throughout this chapter, as it applies to all of the counterexamples discussed here.

A final note concerning the example from Malagasy is that it is only a counterexample given the definition of translation defined by ***T***. At the end of the previous chapter, an alternate hypothesis with a slightly weaker set of criteria, ***T'***, was suggested, that would not require that the SL division of presuppositions and assertions be reproduced in the TL. On this definition, English and Malagasy are intertranslatable as they stand, that is, they are at E_0. As is always the case with this sort of counterexample to universal translatability, whether it has any weight depends on the cogency of the argument that presuppositions must be preserved for successful translation. Alternately, one could take away from this case that translatability may be a universal property of NLs given one set of criteria, but be a less common property given another, more restrictive, set of criteria.

§1.2 Coreference

As Keenan himself had noted, in his discussion of the need for efficiency in natural languages, no NL has grammatical devices which overtly mark, in the general case, a pronoun as identical in reference to an antecedent noun (Keenan 1978). There are, however, many languages which can, in some circumstances, overtly mark a pronoun as sharing, or not sharing, a reference with a noun or another pronoun proceeding it in the same sentence (1975,1976,1978). But these devices are not evenly distributed across natural languages.

A familiar example is the use, as in English, of reflexive pronouns such as *himself*, which are used in the third person as positive indicators that a pronoun shares its reference with some relevant antecedent. Such positive indicators are lacking in other languages, e.g., Gilbertese and

Fijian[86] (Keenan 1978). "Bill tripped him" and "Bill tripped himself" would both be translated into a language without positive indicators by the same sentence, thus losing some important information.

Conversely, many languages have negative markers, an overt morphological element indicating that a pronoun definitely does *not* have the same reference as some available noun. Keenan explains that (1978:185, italics in original)

> English is particularly limited in this respect. While it does appear that we can stipulate negative co-reference for indefinite NPs in certain environments, as in *some students were collecting the tickets while others were showing people to their seats* in which the students who were showing people to their seats must be different from those who are collecting the tickets, it is in general not natural to stipulate negative coreference between definite NPs. Thus it is most natural for a speaker to assert *John thinks that Mary loves him* regardless of whether he intends *him* to co-refer to *John* positively or negatively.

On the other hand, a number of languages indigenous to North American and New Guinea place morphological markers on subordinate verbs which indicate whether the subject is the same, or different, from that of another verb. Then, in these languages, unlike in English, both positive and negative coreferences are marked[87].

[86] Also, Old English. This raises the amusing question of whether Old English is translatable into contemporary English. The question of whether, more generally, NLs are translatable with past versions of themselves (as would seem to be required by ***T***) leads into consideration of the identity criteria for languages. Once again, this central but thorny issue was swept under the carpet by most authors discussing translatability; we will return to it in Chapter IV.

[87] The phenomena under discussion here is known as *switch reference,* which is "typically verbal inflection which indicates by a simple binary choice whether the subject of the marked verb is coreferential or not with the subject of some other verb" (Roberts 1997). A large literature on this topic exists, and surveys have been made of the distribution of switch reference in the languages of Australia (Austin 1981), North American (Jacobsen 1983) and New Guinea (Roberts 1997).

For the sake of brevity, we will examine only one of the data points which Keenan presented. All of the cases are roughly parallel, although in some of them the difficulty lies with translating from English into languages without positive indicators, while in others the problem is with going from languages with negative indicators into English. Although devices are available to capture, broadly, the intended meaning, once again problems emerge at the level of presuppositions.

Consider the following two sentence in Hopi (Keenan 1978:186; this is the same case that was briefly discussed in Chapter II, §6.3):

(3.5) John navoti:ta (pam) mo:tita-ni-quay

John knows he win- (suffix indicating same-subject as the main verb)

(3.6) John navoti:ta pam mot:tita-ni-q

John knows he win- (suffix indicating different subject from the main verb)

Both (3.5) and (3.6) translated into English most naturally as

(3.7) John knows that he will win.

However, (3.5) indicates that John has himself in mind, while (3.6) specifies that John is thinking of some other male person. This information is marked by the choice of verb suffix, *-quay* or *-q*. Therefore, (3.7) is not an acceptable translation in either case, since it is true under a broader range of conditions than either of the Hopi sentences. The situations in which (3.5) and (3.6) would be true are mutually exclusive, modulo very strange circumstances, but (3.7) can be asserted truly in any of those scenarios.

An option which may occur to a careful translator dealing with (3.6) would be to replace the “he” in (3.7) with the name, or a definite description, of the winner, one that would be recognizable to both speaker and addressee. This is, indeed, a maneuver which might be employed in practice. However, this would be to make explicit, or assert, information that is merely left up to context in the Hopi sentence, and so would be objectionable by the standards of the present discussion.

Katz’s response to this case was, unsurprisingly, that unambiguous translation into English was possible. While (3.5) might be translated as

(3.8) John knows that he, himself will win.

(3.6) might be translated as either of the following (Katz 1978:222, modified slightly here in order to facilitate comparison with Keenan’s presentation):

(3.9) John knows some specific male other than himself will win.

(3.10) John knows someone else, some particular male, will win.

Although Katz acknowledged that these are somewhat unnatural sentences, he maintained that they are acceptable translations because they both have the same meaning as the original Hopi sentences.

The translation of (3.5) as (3.8) is unobjectionable. However, Keena argued against any of the proposed translations for (3.6). As noted, (3.7) is unacceptable because it would be true in the situation described by (3.5), in which case (3.6) would be false.

In the two translations that Katz provided for (3.6), this particular issue has been remedied by using various devices available in English to explicitly state that John and the

reference of *he* are not identical. However, a new issue emerges. In (3.6), it is presupposed that the reference of the pronoun *pam* is known to both speaker and addressee, as is typically the case with the English sentence (3.7) as well. This is indicated by the fact that if no reference for *he* or *pam* is salient the addressee of (3.6) or (3.7) is likely to respond by asking for more information. However, this information is not present in (3.9) or (3.10). Keenan proposes that, as indicated by the use of *some particular* and *some specific*, those sentences are most appropriately used in situations in which the speaker knows the exact reference of *he*, but that information would be lost on the addressee (e.g., *he* is Fred, but the addressee does not know who Fred is).

Thus, for different reasons, all of (3.7), (3.8) and (3.9) fail to serve as exact translations of (3.6). This is, of course, by the standards of ***T***, as the issue is entirely at the level of presuppositions. Although there does not seem to be anything definitely ruling out an, as of yet unthought of, exact English translation for (3.6), it is difficult to imagine what this translation would be. Katz seems to be following the best available translation strategy with (3.9) and (3.10), but as we have seen these are not up to the standard of exact translation as defined by ***T***. Operating with this definition, attaining a translation of (3.6) into English would seem to require the expansion of the TL though the introduction of new functional vocabulary, either with suffixes like those available in Hopi or new pronouns that would encode the same information. Therefore, by the criteria of ***T***, the translation of Hopi into English is at the level of E_2 on the hierarchy of translatability. As noted at the beginning of this section, Keenan (1976,1978) actually presents several such cases, some with English as SL and others with English as TL, indicating that this is likely to be a fairly widespread phenomenon.

One further point should be discussed concerning this case. Katz's original definition of *T* (Chapter II,§3) required only that an ambiguous sentence share *one* sense- or one of the

propositions that it expresses- with another sentence in order for the two to be considered synonymous. If it could be argued that (3.7) is ambiguous in that it has two senses, one of them the sense expressed by (3.5) and the other that expressed by (3.6), it would indicate that there is no issue here for Katz.

Keenan addressed this point. In his work, he differentiated between sentences that are *vague* and those that are *ambiguous* (1978:173). A sentence is vague, in Keenan's nomenclature, when it is underspecified "as it describes distinct situations a and b", but the speaker does not need to know the missing information in order to felicitously employ the given sentence. Sentences are ambiguous when the speaker must know which situation is being described to employ the sentence.

> Thus, we may naturally assert that *the man on the table is hurt* without having to know whether the man is Albanian or not, so the sentence is correctly judged to be vague in this respect. On the other hand, in a normal assertion of *the chickens are ready to eat* the speaker is expected to know whether the chickens are ready to be eaten or rather are ready to dine. So this sentence does not satisfy our criteria of vagueness, and is most plausibly judged ambiguous. (1978:173, italics are modified to correct apparent omissions in the original)[88]

For each counterexample that he presents, Keenan argues that any apparent ambiguity is really a case of vagueness.[89] In the present case, he proceeded as follows. If a Hopi speaker

[88] For the record, I would like to register my objections to eating chickens.

[89] It might be noted here that Katz and Keenan are employing very different definitions of *ambiguous*. Keenan's notion is defined in pragmatic terms involving speaker knowledge and use conditions. Katz's notion involved the propositions associated with a sentence (which was, in turn, an element in a Platonic set). But even though the two concepts are parts of fundamentally different frameworks (e.g., Keenan never discusses propositions, only sentences) it seems that they overlap enough for present purposes.

asserts (3.5) she is committed to the claim that John is both the winner and the knower, and if she asserts (3.6) she is committing to the claim that they are different. But (3.7)

> …forces neither commitment on the part of the speaker. If the speaker has no opinion concerning the relative identities of the knower and the winner he may, as in e.g. a discussion of 'New Zealand's top track star' still report John's knowledge that he (New Zealand's top track star) will win without having an opinion as to whether John is, or is not, a track star.

Therefore, (3.7) is merely vague, not ambiguous. Keenan's reasoning here seems rather strained. It can also be observed that differences seem to emerge between the two apparent senses of (3.7) if the sentence is conjoined with further sentences. Consider "John knows he will win and so does Bill, but Sam does not", which is elliptical for *John knows he will win and Bill knows that he will win and Sam does not know that he will win*. This is felicitous if each *he* refers to John, or if they refer to John, Bill and Sam respectively, but not if the first and second *he* refers to John and the third *he* to Sam. This would seem to indicate that (3.7) has two different senses, which can be felicitously employed in different circumstances.

This was, of course, not the way in which Katz himself responded to this argument. In fact, this particular maneuver would not be available to him. Katz's identity criteria for *senses*, or propositions, was defined in terms of K, which required the exact preservation of entailment relations (see Chapter II, §3), and thus, according to Katz himself, of the presupposition/assertion division [90](see Chapter II, §6.3). Given Keenan's argument outlined above, on this definition,

[90] A reader may be wondering, at this point in the discussion of a case which has hinged on the reference of pronouns, what the *sense of a pronoun* is on Katz's view. It should be kept in mind that on Katz's semantic theory, sentences have *senses*- which are propositions- not the individual elements of a sentence. But we can still ask what role pronouns have in determining the sense of a sentence in which they occur. A pronoun was regarded as a sort of blank awaiting an argument, represented by variable in

whether (3.7) has multiple senses or not, it has none that is shared with (3.6) and thus the two sentences cannot be synonymous[91].

In the same volume containing the Katz and Keenan's longest exchange, the American linguist Thomas Givón independently proposed several cases which were problematic for translatability. These include one that, although it is based on a different linguistic phenomenon, was supported by an argument that was very similar to that given by Keenan in the Hopi case just discussed. Consider the following English sentence (Givón 1978:251),

(3.11) John was surprised that the man who won was drunk.

In (3.11), the noun phrase "the man who won" might be a definite description of some person known to John, in which case a proper name might be substituted for that phrase, for instance, "John was surprised that Bill was drunk". On the other hand, the referent of "the man

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the semantic representation of the proposition (Katz 1972). A pronoun was, in Katz's system, represented by an element of the overall semantic representation of the proposition (sense) that would include various semantic markers identifying the sort of noun phrases that could possibly replace it (e.g., male, female, animate, inanimate…). In this way a pronoun contributed to the overall interpretation of the proposition expressed by a sentence. Note that on this theory the sense of a pronoun is only what can be determined from the *null context*, that is what is known about it in complete isolation from any context (the idea of null context will be discussed further in §5.1).

It is worth noting that not all propositions are, for Katz, the sorts of things that can be true or false, for precisely the reason that they might contain pronouns or other context sensitive elements. *Statements* are the proper subset of propositions which are true or false ("that obey the law of the excluded middle" (1972:122)), meaning that they either contain no deictic elements or that all such elements have been replaced by a determinate element. Thus, "I need medical attention" expresses a proposition which is neither true nor false, even on a particular occasion of use (Katz 1972:123). However, a statement is available which would resolve any context sensitive elements (e.g., "J. Katz needs medical attention at 1200 noon, 1 July 1972") and might thus be either true or false. This holds of any sentence that expresses a proposition that cannot be assessed as a true or false: another sentence is available that expresses a fully explicit proposition. This follows from ***E*** (Katz 1972:172).

It seems that the actual resolution of deictic elements, including pronouns is, for Katz, the work of pragmatics, not semantics. On Katz's theory of language use (1977), the pragmatics of a language is essentially limited to the disambiguation of sentences in a given context, that is, with selecting what proposition, or sense, that belongs to a sentence is appropriate on given occasion of use (Levinson 1983).

[91] One might also be tempted to respond that (3.7) cannot be synonymous with both (3.5) and (3.6), because the two Hopi sentences are certainly not synonymous by any reasonable definition. But such an argument is not available to someone operating with Katz's definition of synonymy, since that definition did not- indeed, could not reasonably- require that synonymy between sentences be a transitive relation (see Chapter II, fn 31).

who won" may be unknown to John beyond being a male person who won some event. English does not overtly dictate one of these two readings, and thus the relation between John and the winner in (3.11) is left up to context.

(3.11) might be translated into Frisian in two ways (Givón 1978:251, italics in original):

(3.12) John wonder ham dat *di* maan wat woon bisöön wiar.
John wonder him that *the* man who won drunk was

(3.13) John wonder ham dat *a* maan wat woon bisöön wiar.
John wonder him that *the* man who won drunk was.

The first translation is true under any circumstances in which (3.11) is true, the second translation, different only in the choice of determiner, is true only in a subset of those circumstances, specifically in the situations in which the winner is unknown to John. In this case, information which was contextual in English is implied in the Frisian by the use of the determiner a. It seems that this Frisian word should be considered a presupposition trigger (see Chapter II, §6.3) which entails this further proposition. This is similar to the homonymous English indefinite determiner, *a*, which "triggers" the presupposition that the subsequent NP is either not unique in context or unfamiliar to the interlocutors.

Translating from English into Frisian presents no difficulties, since (3.11) can always be appropriately translated as (3.12) no matter the identity of the winner. However, we encounter difficulties if we reverse directions, an example of a general point that we will see again and again: translatability need not be, in fact, often will not be, a synonymous relation. While (3.12) can be translated as (3.11), to translated (3.13) as (3.11) would be to lose an important bit of

information, that the winner was unfamiliar to John. Of course, there are various techniques to add this information, such as

(3.14) John was surprised that the man who won, who was unfamiliar to him, was drunk.

But these methods are unacceptable by ***T*** because information that is presupposed in the SL- triggered by the choice of determiner- is no longer a presupposition[92].

Translation of similar sentences from Malagasy into English presents the same difficulty (Givón 1978). Therefore, both Frisian and Malagasy are at E_2 in relation to English since exact translation into English would require adding to the TL a new type of determiner, one which carried exactly the same presuppositions as its Frisian or Malagasy counterpart. Actually, this sort of issue is likely to be widespread given the variety of determiners and demonstratives available in different languages. For instance, German has a single term that corresponds to both *this* and *that*, while in English there are at least pragmatic differences in using *this* as opposed to *some* as an indefinite determiner, e.g., *this guy comes up to me* vs. *some guy*…. A similar issue involving determiners is discussed in §2.1, below, and this diversity in determiner systems will also be explored further.

[92] As it is contained in an appositive clause, it is not exactly an assertion either, but a third type of implication (again, see Potts 2005). However, the key point for the present discussion is simply that information that was presupposed in the SL is being conveyed differently in the TL, in a manner significant for the calculation of truth conditions, according to the argument given in Chapter II, §6.3.

The exposition given here departs somewhat from Givón's, as he was not setting out the case in terms of presuppositions, but rather in terms of what he called "degree of expressive specificity" (Givón 1978:252). I classify the Frisian determiner *a* as a presupposition trigger on two grounds:

(i) It is widely accepted that determiners can function in this way. An example are the English determiners *the* and *a*, the latter of which is discussed above.

(ii) The information that the referent of the relative clause following the Frisian *a* is unknown to the subject of the sentence is certainly entailed. But if this turns out to be incorrect, it seems likely that the sentence would be judged odd or anomalous, but not false in the sense that it would be if, for example, John turned out not to be surprised. Of course, this is an educated guess rather than a report of a native speaker's judgement, but it seems correct based on the way English speakers would typically react to an incorrect use of a determiner, e.g., use of *a* where *the* would have been more appropriate would typically cause a "wait a minute" response.

§1.3 Formal and Informal Pronouns, Semantics and Pragmatics

We should close the discussion of Keenan with an objection that is relatively weak as it stands but points to some important larger issues. Keenan begin by calling attention to the fact that the difference between formal and informal modes of address is encoded by the pronominal systems of many languages. Although he concentrated on the relatively familiar case of the French *tu*/*vous*, he noted that some languages, particularly in Southeast Asia and Australia, exhibit much more complex scales of formality (Keenan 1978:175-76). Indeed, for many English speakers who have some familiarity with other languages, this might be one of the first topics that comes to mind when discussing translatability, since, of course, modern English makes no such distinctions. What we will see is that there are undeniably some issues here at the level of connotations, what Katz would call the level $\boldsymbol{K_4}$ (see Chapter II, §3), which as a practical matter any working translator would certainly have to be aware of to produce a usable TL text. But there may not be any obstacles to preserving semantic content of the sort which would indicate a counterexample to $\boldsymbol{T}$. Ultimately, this points to a larger disagreement between Katz and Keenan on which aspects of language and linguistic competence are a part of semantics, and therefore should be considered when evaluating translatability, as week as the difficulties inherent in keeping these two aspects of meaning separate.

To be clear, Keenan's argument is *not* that English lacks some vocabulary which is necessary to translate the core propositional content of French sentences in the second person. For example, both (3.15) and (3.16) would be most naturally translated as (3.17) (Keenan 1978:175):

(3.15) Tu es malade.

(3.16) Vous êtes malade.

(3.17) You are sick.

Keenan imagined a "Katzian" maintaining that all three sentences express the same proposition, that the addressee is ill, and allows that that "this is tenable as far as it goes" (Keenan 1978:176). Instead, the problem is more subtle, hinging on the fact that *tu* and *vous*, unlike *you*, are (Keenan argues) presupposition triggers, entailing the presupposition that a social relation of a certain type obtains between speaker and addressee.

A sentence which contains *tu*, such as (3.15) is appropriate in a wide range of contexts in which the interlocutors are familiar with one another, or the speaker ranks more highly on some social metric. The speaker may be on intimate terms with the addressee, or of superior military rank, the addressee may be a child, the speaker may be *tutyait*-ing in order to indicate disdain or anger, etc. But the exact inference that is licensed by the use of *tu* as opposed to *vous* must be extrapolated from the context, because the pronoun itself is not precise to that extent.

The difficulty facing a translator is that no English sentence has exactly the same entailments as (3.15). Every candidate is either too broad or too narrow in some sense. If (3.17) or something similar is used, information about the relative social status of speaker and addressee is lost. On the other hand, there are sentences of English which would be appropriate in any one of the specific possible contexts in which (3.15) could be used: "you are sick, my dear"; "you are sick, soldier"; "you are sick, little girl", and so on. It seems for any situation in which (3.15) would be appropriate, an English sentence exists which is also appropriate and captures the relative status of the interlocutors. But the problem is that these English sentences are *too* exact; each one of them is asserting some further information about the relation that is

left up to context in (3.15). Then, Keenan's argument runs, any English sentence that might serve as a translation of (3.15) differs significantly from the source by having either more or less informational content.

Of course, ***T*** places no restrictions on how natural the TL sentence must be. So, it might be suggested that (3.15) can be translated by a conjunction consisting of (3.17) with a very long disjunction listing all of the possible situations in which (3.15) might be appropriately used (e.g., someone translating a dialog between two speakers might say "The French sentence says, 'you are sick' and is indicating that we are in a situation in which the speaker is of higher military rank, knows you, is speaking to you like a child…."). Not only is this a very improbable construction, but it also has a metalinguistic flavor which is entirely lacking in the original. More importantly, this "translation" still fails to capture the exact truth conditions of (3.15). If none of the disjuncts obtained, then the entire enormous sentence would be false, while in such a situation (3.15) would be a presupposition failure and so neither true nor false (Keenan 1978:175-76)[93].

As noted, Keenan suggested that a "Katzian" would object that (3.15), (3.16) and (3.17) express the same proposition. He does go on to provide the caveat that he would "not want to attribute this argument to Katz himself" (1978:176), and in fact this particular defense might have been available to Sapir or Jakobson, but not to Katz or anyone who shared his exact theories. For Katz, propositions are identical to the senses, or meanings, of sentences, and so asking whether (3.14) and (3.17) express the same proposition is to ask whether the sentences are

[93] Recall that Jakobson actually proposed using a disjunction when some information was mandatory in TL but not specified in the SL, and was not otherwise available (see Chapter II, §1.1). However, the examples which he actually gave were far more realistic binary choices, e.g., "she has a brother or brothers". It is possible that Jakobson did not see the preservation of level of formality as necessary for successful translation, since he seems to have been less concerned with presupposition issues.

synonymous (see Chapter II, §3). But Katz's definition of synonymy required that all semantic properties, including entailment relations, be exactly identical between the two sentences, so *if* Keenan is correct that the entailments of (3.15) and (3.17) differ, even as concerns a matter of presuppositions, then they would not express identical propositions as far as Katz was concerned.

However, the Katzians do seem to have the better of this particular argument because it is difficult to make the case that any *semantic* properties of the relevant sentences are actually at stake here, as opposed to pragmatic qualities. This can be seen most clearly by considering the reverse case, the translation of (3.17) into French, which would call for the selection of either (3.15) or (3.16). Making the correct choice requires more information about the situation than is required for the use of (3.17). But a salient question is what the force of this extra information is. It must be at the semantic level to count against ***T***.

As already noted in §1.1, it is a very difficult matter for any theory to draw a definite line between the semantic and pragmatic aspects of meaning (Sperber and Wilson 1986; Carston 2002; Borg 2004). In fact, the apparently intractable difficulties involved in untangling pragmatic considerations from the determination of the truth conditions (or entailments) of a sentence call into question whether there is a principled reason to distinguish these two levels of meaning. However, in cases like the one at hand, we might ask what would happen if a translator made a wrong decision translating (3.17) into French, that is, they translated *you* as *tu* in a context more suited to *vu*, or the reverse. One way to judge whether the impact of the mistranslation is semantic or pragmatic is to imagine the response of a Francophone who has been addressed by the wrong pronoun (or better yet to gather as much data as possible on native speaker reactions, but this clearly would not be possible to do for every such situation). If the truth of a previously undisputed sentence would be challenged, the assertions of the sentence have been changed; if a

"hey, wait a minute!" response would be given, a presupposition failure has been caused so that the sentence has become anomalous and cannot be intelligibly judged true or false (see Chapter II, §6.3 for a discussion of the "hey, wait a minute" test). In either of these cases, the force of the extra information contained in (3.15) and (3.16) as compared to (3.17) would be clearly semantic, since altering that information would have an impact on the truth conditions of the sentence. However, neither of these responses would actually be expected. An addressee might express annoyance, anger, perhaps even violent rage at being addressed informally by the wrong speaker, but this indicates a violation of a social norm or the delivery of an insult, similar to an English speaker addressed as "dude" or "bro" by a total stranger. An addressee who was addressed formally by a familiar speaker may find it somewhat odd or "stiff", but generally not enough to cause a "wait a minute" type reaction.

On the basis of the analysis given in the preceding paragraph, information encoded by the French but not by English seems to fall on the pragmatic side, at least within Katz's framework. The extra information encoded by the French pronouns is not found in the set ***K***, and does not affect the truth conditions of the proposition expressed, and so does not enter into the semantic representation and has no effect on synonymy or translation[94]. Note this would make (3.15) and (3.16) synonymous; it seems that Katz would have been willing to accept this somewhat counterintuitive result, arguing that the sentences come apart at a higher level on his hierarchy (Chapter II, §3) than the base level of semantic properties used to define synonymy. It also follows on Keenan's own analysis, since the extra force of the French pronouns that cannot be

[94] In considering a similar case involving French, Levinson came to the conclusion that "Such aspects of language have conventional but non-truth-conditional meanings" and that "exactly the same…argument can be shown to hold for the complex honorifics of 'exotic' languages" (1983:96).

captured in English is not reflected in the entailments of the French sentences, i.e., it is not found in either the assertions or presuppositions of those sentences.

The case of translating (3.15) or (3.16) into English is symmetrical in that the loss of information incurred by translating *tu* or *vous* as *you* is a pragmatic matter of connotation or social decorum rather than a semantic one. So, the fact that *you* has no direct counterpart in French, or that *tu* has no exact counterpart in English, would be a counterexample to translatability at Katz's level $\boldsymbol{K_4}$, the level of connotations at which Katz freely admitted that numerous counterexamples would obtain, rather than the base level $\boldsymbol{K}$ which defined $\boldsymbol{T}$. It seems, therefore, that this particular argument fails to count against $\boldsymbol{T}$. Although the above argument is drawn from examining the single case of French and English, there is no reason to expect the result not to generalize to other pairs of languages which encode formality differently or in more complex ways.

At the same time as Keenan's argument fails to count against Katz, as defined, it does point towards a larger question of whether $\boldsymbol{T}$ is the most suitable way to frame the discussion of translatability. First of all, it might be argued that there is a clear sense in which the information present in the French pronouns but not in *you* is semantic, since it is associated with the meaning of the words themselves, and it seems that this information makes an important contribution to the meaning of sentences such as (3.15) and (3.16). This suggests that there is something artificial about Katz's definition of what should be considered to be semantic properties- those properties of a sentence that fall in the set K- and therefore are relevant to the discussion of translatability. In fact, as noted above Keenan admitted that he did not regard this particular case as having much traction against a "Katzian", but noted that (1978:177):

> [V]ery many languages…require that competent speakers be able to discriminate among certain types of social or kin relations…The basic ability to make such discriminations must surely then be part of our innate linguistic competence. So on what basis can we rule that [***T***] should apply only to certain parts of our linguistic competence but not others?

Of course, a Katzian might respond that ***T*** was never intended to be anything but a claim about a certain set of properties involved in a formal analysis of meaning, with questions about linguistic competences dealing with pragmatic matters belonging further up Katz's hierarchy than the base level. Such a response leads directly to larger issues about whether it is intelligible to isolate such a basic level, especially given the strictly formal definition of semantics which Katz was employing. Of course, this is, once again, the question of drawing a line between communicability and translatability. For instance, in the case at hand, it might be noted that a French speaker can "flout a maxim"[95] by interchanging pronouns in order to change the meaning of a sentence from a simple observation to an insult. This is a device not available to an English speaker and which could not be directly translated. This change in the message conveyed falls outside of the sense of meaning in which Katz was interested, but this might seem arbitrary, or worse, gerrymandered.

In sum, ***T*** survives the challenge from French pronouns, but it does so by relying on Katz's narrow definition of sentence meaning. What this particular case is pointing to is that even if we accept a definition of translatability entirely in semantic terms, where the boundaries of semantics lie depends on the exact theory of meaning employed. There is also a large question

[95] Not a Gricean maxim, strictly speaking, since those were concerned entirely with the "effective exchange of information". But Grice noted when introducing his list of maxims that "There are, of course, all sorts of other maxims…such as "Be polite" that are also normally observed by participants in talk exchanges, and these may also generate nonconventional implicatures" (Grice 1989: 28).

of whether it is viable to set aside a level of truth-conditional meaning that can be formally represented by something like Katz's semantic representations, and which can be used to determine truth conditions apart from any pragmatic considerations. A brief survey of semantic theories (compare e.g., Katz 1972; Borg 2004; Sperber and Wilson 1986; Recanati 2004; Kaplan 1977; Wittgenstein 1953) shows that there is no consensus on either of these questions. This underscores the observation that in the investigation of translatability, different results will obtain depending on the theory of meaning that one approaches the problem with.

§2. The Translatability Challenges of Salish Languages

Keenan's challenges to Katz where taken up again more recently by Matthewson and von Fintel (2008), who drew on Matthewson's field research (1998,2001,2006) concerning presupposition in Salish, a family of endangered languages indigenous to the American Northwest and British Columbia areas. They interpret this research as supporting Keenan by demonstrating that the determiner systems of Salish languages do not encode the same information carried by English determiners. This creates a large class of sentences which are untranslatable, by ***T***, between English and Salish.

Besides this difference in the determiner system, Matthewson asserts that at least in some Salish languages, the role of presuppositions are very different from those in English. Sentences are spoken during normal conversation and judged acceptable by interlocutors which, in English, would be infelicitous due to presupposition failure. Although not a direct challenge to ***T***, this topic will bear discussion because the results here are still important illustrations of some of the issues involved in the study of translatability. If correct, this analysis of Salish presuppositions

would also lend some credibility to the results mentioned in the last paragraph by demonstrating in what manner and to what degree presuppositions differ between Salish languages and English[96].

§2.1 Determiners

Salish languages in general differ from English in that they lack definite determiners. In all of these languages, the same morphemes are used to translate both the English definite determiner *the*, which precedes reference to an entity already familiar to the interlocuters or which is unique in context, and the indefinite *a*/*an* which precedes reference to a entity newly introduced in context or one of a plurality of referents (Matthewson 1998; Davis and Matthewson 2009). For example, exactly the same St'at'imcets sentence was offered in both of the following contexts[97] (von Fintel and Matthewson 2008:180):

(3.18) *Context: There is one puppy in the room. It is sleeping.*

cw7áoz-as kw-á-su wenácw-ts! wa7 guy't [*ta sqéqx7-a*]

NEG-3CONJ DET-IMPF-2SG.POSS true-mouth IMPF sleep [DET puppy-DET]

Be quiet! The puppy is sleeping.

(3.19) *Context: There are five puppies in the room. One of them is sleeping.*

cw7áoz-as kw-á-su wenácw-ts! wa7 guy't [*ta sqéqx7-a*]

NEG-3CONJ DET-IMPF-2SG.POSS true-mouth IMPF sleep [DET puppy-DET]

Be quiet! A puppy is sleeping.

[96] This dissertation will not venture into whether the conclusions on Salish presupposition structures are the appropriate ones, but instead will confine its aims to analysis of how this data may pertain to questions of translatability, and specifically ***T***. Although the theory presented is certainly surprising in places, it is, as a general rule, best to leave the linguistic interpretation of field data to the linguists.

[97] In this context, "7" is part of the official system for transcribing Salish, and indicates a glottal stop (https://www.kwiawtstelmexw.com/language_resources/how-to-read-the-squamish-language/)

This is an example of a general phenomenon to which Jakobson called attention (Chapter II, §1.2). When translating into a TL whose grammar observes some distinction not obligatory by the grammar of the SL, exact translation may require knowledge of extralinguistic facts beyond what is contained in the sentence to be translated (or, as Jakobson proposed, the translator might opt for a disjunction). In this case, exactly the same St'at'imcets sentence must be translated by one of two different English sentences, with the appropriate choice depending on context. The English translation given in (3.18) would be infelicitous in the context described for (3.19), and the translation of (3.19) would be at least odd, although perhaps not exactly infelicitous, in the context of (3.18).

Similar patterns emerge with the introduction of new entities into a discourse, as opposed to referring to ones already mentioned (Matthewson 1998). For example, notice that in the following example drawn from Sechelt, a Coastal Salish language, the determiner *lhe* is used in both sentences despite the fact that the snake-woman is introduced to the discourse in (3.20) but is already part of the discussion in (3.21). Again, which English translation is appropriate- one using *a* or *the*- depends on information which is external to the sentences being translated, and reflects rather the relation of each Sechelt sentence to other sentences in the discourse.

(3.20) t'i súxwt-as lhe 7úlhka7 slhánay….
FACT saw-he DET snake woman….
He saw a snake woman….

(3.21) t'i tl'um s-ukwal-s lhe slhánay…
FACT then NOM-speak-her DET woman…
Then the woman said…

If this were a simple case of Salish languages underspecifying certain aspects relative to English- of using one lexical item to cover the meanings expressed by two in English- it would be less interesting. Mismatches of this sort are, of course, commonplace, since all languages divide reality in different ways and as a result the lexicons of different NLs cannot be placed into one-to-one correspondence. It has been noted that many apparently exotic or untranslatable (relative to English) aspects of Salish languages are, on closer examination, "non-fundamental and relate merely to which aspects of meaning each language chooses to lexically (under-) specify" as compared to English or other familiar languages (Davis and Matthewson 2009:124). Although the difference between English and Salish determiners may fall into this "non-fundamental" category in many respects, this difference is enough to generate gaps in translatability relative to ***T***, since it creates a lacuna that apparently cannot be repaired by appealing to other lexical resources or devices.

Salish determiners *never* display the properties which definite determiners have in other languages, for instance, they cannot be used with an "individual concept reading" (Matthewson 1998)[98]. Further, the determiner distinctions that are marked by Salish languages (which vary from language to language over an astonishing range of information) cut across the boundary between definite and indefinite (Matthewson 1998). This evidence suggests that this is not a case of a single lexical item being used as either a definite or indefinite determiner as given by the context. Rather, the definite determiners of English and similar languages have no counterparts in Salish languages (Matthewson 1998). Actually, this is a very widespread situation that obtains in some of the most extensively spoken languages in the world, e.g., Russian, Japanese, Hindi

[98] An *individual concept reading* does not refer to a particular individual, but to any past, present, or future individual who fits a definite description, for instance, "The President of the United States is powerful" (Demirdache 1996:8).

(Despic 2019). This suggests that the translation issues considered here will be quite common (this will be discussed further at the end of the current section).

There is also evidence that, at least in St'at'imcets and Northern Straits Salish, cleft constructions never carry existence presuppositions, shared by speaker and addressee, as they often do in English (David and Matthewson 2009). A speaker might say felicitously that "it was x that did y" even in a discourse initial context where the speaker has no reason to think that the addressee has any knowledge of x or y. For example, (3.22) is considered appropriate in Northern Straights at the very beginning of a discourse, while in English the it-cleft construction is inappropriate in this context[99].

(3.22) *Na s-pála7-s-a, nilh káti7 ta nk'yáp-a t'ak*

DET NOM-one-3SG.POSS-DET FOC DEIC DET coyote-DET go.along

'Once upon a time, it was a coyote who was going along.' (von Fintel and Matthewson 2008: 180)

These differences, between the determiner systems and the nature of cleft constructions, result in a now predictable problem when translating from English into Salish languages. The presuppositions entailed by the use of determiners or clefts in English sentences are not present in their nearest TL counterparts. For instance, the uniqueness of the puppy entailed by the use of *the* in the English version of (3.18), the familiar (from previous mention) status of the snake

[99] Not every use of an it-cleft signals an existence presupposition in English. For instance, we might insert "It was at that moment that I started to regret studying philosophy" into the middle of a narrative without triggering a "hey, wait a minute" response. But these constructions are felicitous only in a limited range of cases, for instance, most English speakers would reject the use of (3.22) in a discourse initial context. Matthewson's claim is that Salish sentences containing clefts are *never* so rejected due to presupposition failures. The considerations here are reminiscent of the question raised in §1.1, that often must be considered regrading the status of a sentence rejected by the majority of speakers in a linguistic population: is this a grammatical issue, concerning some property of the sentence itself, or the observance of some sort of norm of a different type?

woman captured by the English version of (3.21) or the fact that the cleft construction used in (3.22) implies that we are expected to know that someone is "going along" would not be carried over into a Salish TL under translation. To preserve these presupposed entailments would require that they be stated explicitly in the TL. Thus, although the English sentences can certainly be translated in ways that can be understood, the assertion/presupposition division of the SL cannot be preserved. This violates translatability at the minimal semantic level at which Katz's ***T*** was to hold:

> The St'at'imcets determiner and cleft data therefore support E.L. Keenan's (1974) proposal that translatability cannot be maintained in its strongest form (von Fintel and Matthewson 2008:187).

To fill this gap in translatability by extending the TL would require introducing a new determiner into the TL, one which triggers definiteness presuppositions. Therefore, we can place translation from English into Salish languages *at least* at E_2 on our hierarchy of translatability. The caveat "at least" is present because additional considerations apply in this case to suggest that adding new vocabulary, even functional vocabulary, may not be enough to ensure exact translatability by ***T*** (of course, by ***T'*** there is no issue). Salish determiners are simply different in fundamental ways from their English counterparts. First of all, if Salish determiners as a class are not presupposition triggers, at least for the presuppositions carried by English determiners, then it is questionable whether it makes sense to imagine simply introducing determiners into those languages that would behave in an entirely different manner from those that are already present.

There also is another, closely related, issue. Determiners in English and other familiar languages can access what Stalnaker (1974) called the *common ground* of the conversation. As such, they encode propositions that are shared by both speaker and listener, such as the fact that a

referred-to entity is familiar to both interlocutors. On the other hand, it has been cogently argued that Salish determiners cannot access the common ground and therefore encode no such information (Matthewson 1998:123). The conclusion is reinforced by a more general examination of presupposition triggers in Salish (see next section). It has been argued that this is not a mere surface difference, but rather reflects the setting of a semantic parameter, along the lines of the syntactical parameters introduced to theories of universal grammar in the 1980s (Matthewson 1998:124). If this analysis is correct then any new lexical item introduced into Salish as a determiner cannot function in the same manner as an English definite determiner, which encodes information from the common ground of the discourse.

Considering determiner systems in general, even a very limited survey shows that the NLs of the world encode a bewildering variety of information. Looking just within the twenty-three languages of the Salish family, a relatively small clade, we find that languages vary in whether determiners mark the plural/singular distinction and/or gender. Some of these languages have determiner systems which reflect the proximity of a referred-to entity to the speaker, but each one of these categorizes distance in a different way, and some mark temporal and spatial distance by the same means. Some have determiners which mark visibility, and some the difference between concrete and abstract objects (Matthewson 1998:28-31).

As a further complication to exact translation, the categories into which different NLs group their determiners often cut across one another in complex ways. For example, the determiner system of Bemba, a Bantu language, divides based on the linguistic context in ways that do not map simply onto the definite/indefinite dichotomy of English (Givón 1978). In simple indicative sentences, a single form is used for both definite and indefinite determiners, but the subject of the sentence is always understood to be definite, a trait in common with many other

languages (Keenan 1975). This complicates somewhat the translation of English sentences with indefinite subjects. But in certain modal environments, definite determiners and referential indefinites are grouped together, while non-referential indefinites are differentiated[100]. Thus, consider the following (Givón 1978:240):

(3.23) umuana aasomene *ici*tabo

The child read *a/the/a specific* book.

But under the scope of the modal *aafwaaya*, "want", we find (Givón 1978:241):

(3.24) umuana aafwaaya *ici*tabo.

The child wanted *the* book. / The child wanted *a* (specific) book.

(3.25) umuna aafwaaya *ci*tabo

The child wanted *a* book.

In many cases, such as that of Bemba and English, it seems that an exact translation will be most likely be possible as long as the translator is sufficiently alert to the issues involved. But consideration of all of this crosslinguistic variety in regard to determiners shows it to be likely that there are other cases, similar to that of English and Salish, where translation cannot be exact in Katz's sense due to presupposition issues. We have already seen that the translation of Frisian or Malagasy into English encounters this difficulty due to differences in determiner systems (§1.2). It would be astonishing if no other such cases existed.

[100] *Referential indefinites* are not morphically differentiated in English, but compare the use of the nonreferential indefinite *a* in "He went to the library to find a good book to read on the trip" with its use as a referential indefinite in "She went to the library to find a (specific) book that she needed for her research".

In the previous chapter (§1.2) we looked at the position of Jakobson, who observed that the main practical issue with translation was the fact that different NLs have different sorts of information which must, by the grammar of the language, be encoded. The scope of information that might be implied by the determiners of various languages is an excellent illustration of this point, as is the case we discussed involving Hopi switch reference. Jakobson also remarked that the main difficulty facing translators involved cases where the TL made more obligatory distinctions than the SL. Cases that we have looked at so far suggest that this may not necessarily be so, at least at the level of presuppositions. Looking over the cases presented by Keenan, Givón and Matthewson, we find that the problems involve SLs whose grammar must mark distinctions that are not necessary in the TL, and in fact can only be marked circuitously.

It should also be recalled that Jakobson shared Katz's confidence that translatability and effability are both universal properties of NLs. As we can see, this contention has been seriously challenged, but in the examples we have looked at so far this has largely been attributable to the way in which Katz defined translatability. Jakobson never gave an explicit definition of successful translation, but it is highly probable, based on his discussion of the matter, that he had in mind something weaker than ***T***, perhaps similar to our ***T′***. Such a thesis would be resistant to the counterexamples discussed up to this point. In the rest of the chapter, we will look at cases that challenge even a much weaker translatability thesis. But first, we will pause to discuss further the unique nature that presuppositions seem to have in at least one Salish language.

§2.2 St'at'imcets Presuppositions

Von Fintel and Matthewson (2008) argued that the data concerning Salish determiners and cleft constructions strongly support Keenan's case against Katz. They go on to suggest that in St'at'imcets, a highly endangered Salish language spoken in central British Columbia,

presuppositions do not function in the same manner as in English. The claim is not that presuppositions do not occur in St'at'imcets, that is, the claim is *not* that speakers do not presuppose information when they speak. It seems to be a universal of human languages to provide means for expressing information that is taken for granted rather than asserted, and which "project[s] through certain entailment cancelling operators" (von Fintel and Matthewson 2008:40, see Chapter II, §6.3, page 81 for a discussion of projection). But while in English and other well studied languages these presupposed aspects of meaning "impose some constraints on when an utterance is felicitous" (*ibid*.), this phenomena does not occur in St'at'imcets. Along these lines, it has been proposed (Matthewson 2006) that the analysis of presuppositions given by Stalnaker (1974) is appropriate for English, but does not match the empirical data for certain Salish languages, including St'at'imcets. Instead, the theory of Gauker (1998), which defines presuppositions much differently, is argued to be a better fit in those cases.

Stalnaker began with the relatively uncontroversial observation that P presupposes Q if one can reasonably infer that a speaker must believe Q whenever they say that P, and in general a belief in Q would also be inferred from an utterance of $\sim P$. On Stalnaker's view, this phenomenon should be understood against a background of knowledge shared by interlocuters. Q is part of a set of propositions that are "something like the background beliefs of the speaker" (1974:472) and can be a presupposition only if

(a) the speaker believes that Q

(b) the speaker believes that the addressee also believes Q

(c) the speaker believes that the addressee believes that that the speaker believes that Q.

Defined in this way, presuppositions are shared beliefs which, together, form a sort of common ground shared by participants in a conversation. Jointly, the three conditions form a constraint on what can be appropriately said by a speaker. A sentence that, in context, presupposes something that violates one of the three is likely to trigger a "wait a minute" type response (see Chapter II, §6.3). The essential part of von Fintel and Matthewson's case, backed by field data to be discussed shortly, is that (b) and (c) do not apply for St'at'imcets.

Gauker's theory (1998) is based on *propositional elements*, units of meaning which are part of the context and relevant to the evaluation of an utterance (1998:149). These are entities that are similar to presuppositions, but which are objective in nature: "facts that are particularly relevant to the conversational aims of the interlocutors, whether they are aware of these facts or not" (1998:150). A fact which is salient, and available to be known, can belong to the relevant set of propositional elements without being presupposed or even known by anyone. In contrast, *presuppositions* are a speaker's private assumptions about the context, their "take" on a given set of propositional elements (1998:162). On this view, a proposition needs to meet only the first condition, (a), from Stalnaker's list to be considered a presupposition.

Leaving to one side metaphysical questions about propositions, beliefs, and facts, what this boils down to in observable terms is that, on Stalnaker's theory, how a speaker conveys information is constrained by what they take the audience's belief to be. If they are mistaken about those beliefs, or ignore them for some reason, then the utterance is infelicitous to some extent, and they may be challenged by the audience if the degree of inappropriateness is severe enough. Gauker's theory makes no such prediction, since presuppositions are relative to the speaker only. Although this may seem like an odd claim, Gauker was motivated by the puzzle of informative presuppositions, e.g., "We regret that children cannot accompany their parents to the

commencement exercises" (Gauker 1998:160, quoted from Karttunen 1974:191), which presupposes that children cannot accompany their parents even though the addressee is not only not assumed to know this beforehand, but actually expected not to know. Gauker reasons that (1998:162)

> [I]n light of the phenomenon of informative presuppositions we ought to recognize that the [presuppositions of an utterance] need not consist of shared assumptions after all…a speaker's presuppositions are merely the speaker's own take…

An important, and testable, consequence of this theory is that speakers would very rarely be challenged, even if an utterance presupposes things that the addressee does not know, or believes to be incorrect. Informative presuppositions notwithstanding, Gauker's theory has been observed to be a poor fit for English, and for most languages whose presuppositions have been studied in detail, since it clearly predicts that many utterances would be felicitous in contexts where they are inappropriate. We would expect many utterances that would be fully acceptable on Gauker's account to be challenged by competent speakers (von Fintel 2000). An example would be the following, spoken in an "out-of-the-blue" context (von Fintel 2000:15):

(3.26) John is having dinner in New York too.

On Gauker's theory, this utterance should be fully acceptable. The speaker would have no reason to expect the addressee to have knowledge of the same propositional elements which the speaker themselves did, including who is having dinner and where. The addressee, in turn has no reason to assume that the speaker would expect them to know anything in particular (von Finel 2000).

While Gauker's theory clearly does not accurately describe the pattern of normal discourse in English, it has been argued that it does match that of St'at'imcets (Matthewson

2006, von Fintel and Matthewson 2008). Let us look briefly at a couple of Matthewson's data points (she has many more); those in the last section are also relevant. A typical case is (3.27), which was observed in a natural social setting rather than an elicitation context (Matthewson 2006:2, italics added). *B* has just come into *A*'s home and exchanged greetings. *A* then asks[101]:

(3.27) *A*: wá7-lhkacw ha xát'-min' ku *hu7* ku tih
IMPF-2SG.SUBJ YNQ want-APPL DET *more* DET tea
Would you like some *more* tea?

Notice that the sentence *hu7*, which is equivalent to the English *more*, a *presupposition trigger* (word that signals the entailment of a presupposition, see Chapter II, §6.3). Yet rather than challenging *A*'s apparently inappropriate-in-context utterance, *B* instead responded simply:

(3.28) *B*: iy
Yes

In another example (Matthewson 2006:6, italics added), there has not been any previous mention of anyone being in jail,

(3.29) A: wá7 t'it l-ti gélgel-a tsitcw k Lisa
be also in-DET strong-DET house DET Lisa
Lisa is *also* in jail.

(3.30) B: stam' ku s-záyten-s
what DET NOM-business-3POSS
What did she do?

[101] In the literal gloss of the sentence, "YNQ" indicates "yes-no-question". Most of the other abbreviations that Matthewson used for this purpose are fairly standard and self-explanatory.

Similar results were observed for the St'at'imcets equivalents of other English presupposition triggers such as "stop" and "again" (Matthewson 2006). Matthewson acknowledged the possibility that cultural factors, such as norms of politeness, might be suggested as an explanation for the lack of a challenge response, but she considered this to be highly unlikely for at least two reasons. First, she and the other field linguists working with her were uniformly younger than their native speaking informants, and in Salish culture older persons routinely correct younger ones. Secondly, and crucially, informants did routinely challenge other sorts of utterances that were grammatical but somehow infelicitous in context, such as the use of a sentence containing a pronoun without a clear reference (Matthewson 2006)[102].

Another possibility is that the St'at'imcets words glossed as *more*, *stop*, *also*, etc. are only rough equivalents of those English words and, in particular, differ from their best available translations in that they are not presupposition triggers. Matthewson argued that the evidence does not support this explanation. If the presupposition failure is outlandish enough (e.g., implying a second sun in the sky) it will result in a challenge response, although these are formulated in exactly the same manner as challenges to false assertions. Further, although the interpretation of the data here is complex, given the general lack of response to presupposition failures, Matthewson reported that the presuppositions triggered by the lexical items in question project in St'at'imcets[103], as they do in other better studied languages, and she took this to be a crucial indicator (Matthewson 2006). Finally, although speakers do not normally challenge

[102] In her guide to the methodology of semantic fieldwork, Matthewson noted that, in general, the correct identification of presuppositions was by far the most challenging task involved in fieldwork, and was usually much more difficult than correctly identifying the truth conditions of a sentence (2004a).
[103] Presuppositions are said to *project* out of certain environments (e.g., the scope of a negation) that cancel assertions. See Chapter II, §6.3.

apparent presupposition failures, they will, when prompted about their metalinguistic intuitions, offer judgements such as that (3.31) would be inappropriate for a speaker to use if he or she knows that the intended addressee has not eaten any salmon yet (von Fintel and Matthewson 2008:48):

(3.31) *lh-xát'-min'-acw* *múta7* *ku* *ts'wan,* *kwan*
HYP-want-APPL-2SG.CONJ more DET wind.dried.salmon take(DIR)
láta7
DEIC
'If you want some more wind-dried salmon, take some.'

Matthewson argues that these considerations appear to indicate that the St'at'imcets translations of English trigger words do, in fact, carry presuppositions. However, she concludes, the nature of the presuppositions in St'at'imcets seems to be better suited to the analysis of Gauker, in that they are a reflection of the speaker's own beliefs about the situation rather than of a common ground believed to be shared between the interlocuters. A hearer will not typically challenge an apparent presupposition failure, because in St'at'imcets there is no reason for the

hearer to expect that the speaker would take their lack of knowledge into account when using a presupposition trigger such as "also" or "more". [104]

The import for translatability of this data on St'at'imcets presuppositions is difficult to specify exactly. Von Fintel and Mathewson rested their case against ***T*** on the more specific evidence drawn from determiners and clefts. This is possibly because there seems to be no semantic issues for translation with the sort of sentences given in (3.27) and (3.29). The oddity of these sentences, relative to English, comes out only a certain context of use, that is, ones where they entail presupposition failures from the point of view of the addressee. Therefore, it might be argued that the issue here is entirely pragmatic, having to do with what aspects of other person's mental states the interlocutors will take into account when speaking or processing an utterance. On the other hand, the case can be made that these sentences can be used felicitously and truly in contexts where their English counterparts would be infelicitous, and so neither true nor false.

[104] Matthewson (2006) asserted that the fact that an English speaker would find the nature of St'at'imcets presuppositions to be very odd actually strengthens, rather than detracts from, her theory; languages that are genetically and typologically distant *should* differ in deep and fundamental ways.
As noted previously, this dissertation is not the place for an in-depth analysis that would offer an informed conclusion on Matthewson's field methodology or conclusions (which, incidentally, seem convincing in my non-expert opinion). But I will take a moment to note that I find the explanation that she offers to be unlikely. Matthewson proposed that a *parameter* governing the use of presuppositions is set differently in Salish and Indo-European languages. On reflection, the idea of a pragmatic parameter seems inappropriate. Chomsky originally (1981) proposed syntactical parameters as something like switches in a machine. Although this later proved to be far too simple of a picture (Rey 2020), the basic analogy of parameters with a setting in a computational device remains accurate (this point will be discussed in more detail in Chapter IV, §3). Of course, the existence of such settings only makes sense if there is some sort of computational system for the parameter to be a parameter *of*. Thus, on a theory such as Chomsky's in which language is essentially a computational module of the mind devoted to syntax, the theory of syntactic parameters is sensible. We might also postulate semantic parameters on a theory such as that of Borg (2004) which proposes a computational semantic module. But, given that the pragmatic interpretation of an utterance draws on so much of a language user's global knowledge and mental resources from far beyond the language faculty, it is very unlikely that there is any sort of analogous pragmatic computational module that would have parameters to be set. It might be observed that certain aspects of behavior outside of language seem to involve "parameters", e.g., driving on one side of the road or another. But these sorts of choices, which are consciously (if often habitually) followed and of which agents are fully aware, and which, importantly, are completely social in nature, are very different in nature from the parameter settings of a language, and it seems a stretch to use the same term refer to both.

Certainly, a discourse between St'at'imcets speakers may follow a pattern that, when translated into English, makes little sense to someone without supplemental knowledge (e.g., 3.29-3.30).

We can conclude this brief discussion of St'at'imcets presuppositions by noting that they seem to point to issues that we have already flagged during the discussion of Keenan's counterexamples. We might accuse Katz of stacking the deck, so to speak, by insisting that translatability is an entirely semantic issue, concerning only the set K. We have identified a range of sentences in English and St'at'imcets that are typically translatable, but for which translation fails in certain contexts due to factors concerning the extralinguistic knowledge of the addressee. Cases such as this seem to indicate that, once again, the translatability/communicability distinction is sometimes difficult to maintain.

§3. Nez Perce Modals

Research into the Nez Perce (*Niimiipuutimt* to the speakers themselves) language, conducted by the linguist Amy Rose Deal, suggests a different sort of gap in translatability, one not involving presuppositions (Deal 2011,2014). Instead, the modal system of Nez Perce contains a gap, relative to English, in its functional vocabulary that has far reaching consequences. English sentences expressing necessity outside of an epistemic context cannot be translated into Nez Perce without resorting to paraphrase that often alters the basic truth conditions of the SL sentence. If correct, this constitutes a counterexample not only to ***T*** (because, following Katz's semantic theory, different truth conditions imply a different semantic representation, and also different entailments) but to ***T'*** and even weaker translatability theses, since it is generally assumed that having equivalent truth conditions is a necessary property for

translation[105]. For instance, Deal finds that "There is no semantically equivalent Nez Perce translation" (2014:5) for sentences such as "If I *have to* go in, I will" (2011:576), "If the doctor *needs* to see him…he should head over" (*ibid*) or "Employees *must* wash their hands before returning to work" (2014:5). She interpreted such results as direct evidence against Jakobson and Katz (Deal 2011:559,662,576).

This claim is surprising, as the category of non-epistemic modals includes deontic modals, words dealing with ethical, legal, or otherwise rule-based obligations. The assertion that any human language lacks the means to express deontic necessity without employing periphrastic methods may well strike most readers as incredible. Sentences of the form "x must do y" or "x should do y" are an integral part of the quotidian experience of most English speakers, to the point where it is difficult for us to imagine any society functioning without a simple lexical means of expressing such messages. Yet, the data from Nez Perce indicates that it is such a language, suggesting that perhaps the fact that this seems so difficult to imagine is due at least in part to cultural bias[106]. In practice, various strategies are available to Nez Perce speakers that allow them, given a particular context, to communicate necessity in ways that are more or less clear. This still leaves a large class of English sentences with no exact equivalent in Nez Perce. In order to make these claims precise, we should turn now to a comparison of the modal systems of English and Nez Perce.

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[105] This seems intuitive and, as discussed, authors generally simply assume this point without any argument (Keenan 1974, Matthewson 2006, Deal 2011). But the point can certainly be debated, see Burges 1978 and Bar-On 1993. I will argue in Chapter IV that when translatability is correctly framed, the problem becomes more or less irrelevant.

[106] N.B. This is not to assert that the Nez Perce have no prohibitions or rules, something which is certainly false. For instance, it is known that in their traditional beliefs "The souls of the dead would journey to an afterlife, but their safe arrival depended on strict adherence to the necessary rituals" (Sutton 118). However, in light of Deal's data these rules are promulgated without ever being formulated directly as "you must do x" or "you must not do x", and this may possibly indicate something interesting about social norms and perhaps societal organization in traditional Nimiipuu culture.

§3.1 The Nez Perce Modal System

The modal lexicon of a language can be differentiated along two dimensions. The *force* of a modal lexical item is whether it signifies *possibility* or *necessity*, the logician's ◊ and □. The *flavor* is what sort of possibility or necessity it indicates: epistemic, deontic, circumstantial, and so forth[107]. The split between epistemic and other flavors is generally taken to be particularly fundamental, with non-epistemics collectively known as *root* modals.

In the familiar example of English, force is always overtly encoded at the lexical level, but there are many common modal words which are flexible between epistemic and root flavors. *Must* and *might*, for instance, can express both epistemic and root modality. Consider the following examples (from van der Auwera and Ammann 2013):

(3.32) You **must** go home now.

(3.33) Terry **must** be from Northumberland.

In (3.32) the basis of the "must" is circumstantial, a deontic obligation based on some set of norms or rules, while in (3.33) it is the speaker's knowledge about the subject of the sentence.

This feature of the modal system, in which there is flexibility between epistemic and root meanings for both possibility and necessity modals, is almost universal among Indo-European languages but quite rare elsewhere. In one major survey, less than half of the languages

[107] This categorization followed here reflects that found in the important work of Kratzer (1981,1991), who distinguished *epistemic* from *root* modals (1991) (note, however, that the classification scheme did not originate with her and the epistemic/root distinction can be found back at least as far as the 1970s, e.g., Calber 1975, Palmer 1979). Epistemic modals are based on what is known, root modals on the circumstances. Root modals are then further differentiated by *ordering source* into categories such as deontic or bouletic. In practice, it can often be difficult to clearly identify the difference between "circumstances" and known facts, which has led to suggestions that the two basic categories should be redrawn into at least three new ones. Generally, these theories have an additional category straddling what had been the divide between epistemic and circumstantial (Matthewson 2016). None of these proposals would substantially affect the discussion in this section, other than to recast it into different terms.

examined have any such feature, and the majority of those that did exhibit this phenomena for only possibility modals or necessity modals, but not both (van der Auwera and Ammann 2013). This means that more than half of the world's languages overtly encode the flavor, root or epistemic, of all modal vocabulary. This seems to indicate that there should be widespread failures to preserve the assertion/presupposition division when translating between languages that divide up modal space differently. I will leave this to the side, since presupposition issues have already been discussed extensively in this dissertation[108].

Nez Perce is one of those languages that allows no overlap between epistemic and root modal vocabulary. Various particles express epistemic possibility and various different ones express epistemic necessity. Examples include *pay's* and *pàalswit* (*maybe*) and *'èete* (*surely*) (Deal 2011:569). The suffix *-o'qa* is a root possibility modal which will be discussed below, and which appears to lack a dual for necessity, thus causing the expressive gap. Native speakers systematically reject the use of *-o'qa* for epistemic modality or the use of epistemic modals in sentences where *-o'qa* is appropriate (Deal 2011).

Before we turn to the discussion of *-o'qa*, a brief diversion is necessary to discuss *scales*. Modals and other types of quantifiers typically form a part of a *Horn Scale*, a gradation by which one can infer that a logically compatible but stronger term would be inappropriate when a

[108] Although this issue has not received much attention (aside from a brief discussion in Deal 2014), it is a situation that must obtain extensively between languages, because every possible combination of modal categorization along the two basic axes of flavor and force has been reported. For instance, Javanese differentiates both flavor and force (Vander Klok 2008), while the indigenous Californian language Washo is reported to have a single commonly used modal that is flexible in both directions (Bochnak 2015). Some languages split flavor differently, for instance the division of epistemic modals into separate categories depending on the source of the information is common amongst languages indigenous to North America (Rullmann et al. 2007). The challenge for translatability is that when going from a language that makes less distinctions into one that makes more, information that was originally contextual must now be overtly expressed. Again, this is reminiscent of Jakobson (Chapter II, §1.2).

weaker one is used instead (Horn 1972; Gadzar 1979). The property that licenses this inference is known as a *scalar implicature*[109].

Consider the following pair of English sentences:

(3.34) I drank *some* of the beer.

(3.35) I drank *all* of the beer.

(3.34) is logically consistent with (3.35) in the sense that both can be true at the same time. (3.35) entails (3.34), so, logically speaking, the contexts in which (3.35) is true are a subset of those in which (3.34) are true. Therefore, (3.34) can be truthfully uttered any time that (3.35) can. But the use of *some*, rather than the stronger *all*, its *scalemate*, triggers the scalar implicature that (3.35) is false in a context in which (3.34) is asserted.

The situation with modal vocabulary is similar, which might be predicted since modals are generally regarded as quantifiers over possibilities, or possible worlds. Thus, in the sentences:

(3.36) She *might* be at home.

(3.37) She *must* be at home.

the use of "might" in (3.36) implies that the stronger "must" does not obtain. Therefore, the use of (3.36) implies that (3.37) would be inappropriate, either false or going beyond what the speaker knows about the situation.

Deal (2011:560) asks us to imagine a language containing a quantifier with no scalemate. Although no such NLs have been reported (excepting modal quantifiers, of course), consider the

[109] The exact details of what warrants such an inference are controversial, but irrelevant for our purposes.

hypothetical $\exists nglish$, identical to standard English in all respects except that it lacks the universal quantifier *all*. This means that *some* has no stronger scalemate in $\exists nglish$, and it would be predicted that speakers will use *some* in circumstances where speakers of standard English would consider it inappropriate, e.g., they would utter (3.34) in a context where an English speaker would use (3.35). But this flexibility in the interpretation of "some' would disappear when considering downwards entailing environments (DEEs), such as under the scope of a negation[110].

Consider the following two sentences, the negations of (3.34) and (3.35):

(3.38) I did not drink some of the beer.

(3.39) I did not drink all of the beer.

The fact that an utterance of (3.38) does not mean the same thing as (3.39) cannot be derived from a scalar implicature. There is no such implicature in this case, since (3.38) is not weaker than (3.39), even though (3.38) contains the quantifier *some* as compared to *all* in (3.39). In fact, (3.38) is a stronger statement and entails (3.39). A speaker of $\exists nglish$ cannot use (3.38) to mean (3.39) any more than an English speaker could; that *some* has no scalemate in $\exists nglish$ would make no difference in this case.

[110] A reader familiar with the concept of *downwards entailing environments* can skip this footnote.
A DEE is a linguistic context, for instance, under the scope of a negation, which reverses entailments that are based on the relation between a set and its subsets. For instance, (3.35), a claim about *all the beer*, automatically entails (3.34), the same claim about *some of the beer*. But if the sentences are negated this relation is reversed, so that the negation of (3.34) "I did not drink any of the beer" entails the negation of (3.35) "I did not drink all of the beer". This can be described as a reversal in strength between quantifiers, including modals, so that in DDEs existential quantifiers cannot be considered weaker than universal quantifiers, and therefore scalar implicatures are not triggered in these environments. This situation also obtains for *non-monotone environments*, contexts which are neither downwards nor upwards entailing.
Although negations are perhaps the most easily recognized example of DEEs, the same situation obtains in the antecedent of a conditional (usually considered to be non-monotone) and in the restrictor of a universal quantifier; we will see examples of both in the next subsection.

Deal suggests that a hypothetical linguist analyzing this data would report that the $\exists nglish$ quantifier *some* would normally be an adequate translation of both *some* and *all* from standard English. However, the translation of *all* occurring in a DEE would be problematic and would require periphrastic methods. Deal's data strongly suggests that Nez Perce is similar to $\exists nglish$ in that *-o'qa* is a root possibility modal lacking a stronger scale mate. Like the $\exists nglish$ *some*, the modal *-o'qa* can often be used flexibly, in this case to express both possibility and necessity, but in a DEE an expressive gap occurs.

The flexibility of *-o'qa* is demonstrated by data points such as (3.40), where the allomorph form *-no'qa* is used (Deal 2011:561, bolding added to English sentences).

(3.40) 'inéhne-**no'qa** 'ee kii lepít cíickan.

take-MOD you DEM two blanket

a. 'You **can** take these two blankets.'

b. 'You **should** take these two blankets.'

Bilingual informants judged both a. and b. to be accurate translations of the Nez Perce sentence, which in turn was reported to the best translation of both English sentences.

Despite this general flexibility in most upwards entailing environments, Nez Perce speakers showed a strong preference for translating *-o'qa* into English using possibility modals such as *can* or *might* whenever possible. When English is the SL, although necessity modals outside of downwards entailing environments are translated using *-o'qa*, speakers reported that they "did not feel that the translation was perfectly accurate" (Deal 2011:564). These preferences

suggest that *-o'qa* is a possibility modal, although a flexible one, and not a polysemous lexical item; that is to say, it is a possibility modal that can occasionally be pressed into service to express necessity in the right circumstances and not a word with two meanings.

This conclusion is reinforced by the fact that only possibility readings obtain in a DEE (similar to what is predicted for English-∃ and "some"). In Nez-Perce, the negation *wéet'u* is a sentential operator that occurs to the left of the verb and scopes over everything to its right. When *-o'qa* occurs under its scope, only negated possibility readings, ¬ ◊, are judged correct, while ¬□ readings are rejected, as predicted. (3.41) is an example in which a proposed¬□ reading is rejected by informants (Deal 2011:574, bolding in original).

(3.41) Context: I tell someone my number and I see that they are trying to remember it. I say, 'You don't have to remember it; here's my card.'

#wéet'u 'ee timiipni-**yo'qa**

not you remember-MOD

Consultant: 'You're just saying, "you wouldn't remember"

Deal demonstrates that this same pattern obtains in other DEEs, such as in the restrictors of universal quantifiers. It is this gap in the vocabulary for root, i.e., non-epistemic[111], necessity in DEEs that creates a counterexample to *T*, and even *T'*, when English is the SL and Nez Perce the TL. Presumably, the same issue would obtain with any SL having a modal system along standard Indo-European lines, that is, one that always used separate lexical items for possibility and necessity.

[111] Recall that Nez Perce *has* epistemic necessity modals, see the bottom of page 110; the issue under discussion here is confined to root modality.

§3.2 Conveying Necessity in Nez Perce

To express non-epistemic necessity in Nez Perce, paraphrastic techniques must be employed. This means that when translating from English, sentences containing root necessity modals must undergo paraphrase and rearrangement, which are often extensive, especially when the modal occurs in a non-upwards entailing environment. As a result, it can apparently often be impossible to arrive at a TL sentence with exactly the same truth conditions as the SL sentence undergoing translation.

It may occur to an English speaker that a seemingly obvious fix is to translate a necessity modal under the scope of a negation as a negation under the scope of a possibility modal, that is, to express $\neg\Box\varphi$ with the logically equivalent $\Diamond\neg\varphi$. This is the equivalency captured by the interchangeability, in English, of *not necessarily* with *possibly not*. However, such a paraphrase is ruled out by the syntax of Nez Perce. Recall that the negation operator *wéet'u* must occur to the left of the verb which it is negating, in both surface and logical structure, and will scope over everything to its right. Because the modal suffix *-o'qa* must be attached to the verb, $\Diamond\neg\varphi$ is not a possibility in Nez Perce. This is reflected in data points such as (3.42), where the informant rejects a $\Diamond\neg\varphi$ reading in favor of $\neg\Diamond\varphi$ (Deal 2011:574, bolding in original):

(3.42) Wéet'u máwa hi-pa-'yáax̂-**no'qa** 'inpeew'etúu-nm.
not when 3SUBJ-S.PL-find-MOD police-ERG
a. 'The police would never find me.'
b. #'It's possible that the police won't ever find me.' (Deal 2011: 574).

There are at least two reasons why the informant would reject a. as a possible reading. First, there is no way that the negation can be understood to scope over the verb *yáax̂,* meaning *find,*

but not the modal suffix *-no'qa*, as would be required for the$\Diamond\neg\varphi$ meaning. As Deal emphasized (2011:574, caps in original):

> Given that the negation MUST SCOPE OVER THE VERB in Nez Perce, it is not possible to arrive at $\Diamond\neg$ interpretations via scopal rearrangements.

In addition, as mentioned at the end of the last section, because the modal is under the scope of the negation, it can only be interpreted as a possibility modal, so the $\neg\Box$ reading which is equivalent to $\Diamond\neg$ is also blocked (by the same reasoning that tells us that in $\exists English$ one cannot use $\neg\exists\varphi$ to mean $\neg\forall\varphi$) [112].

A translator working from English into Nez Perce might also comb through all available data on the language for some less commonly used modal terms, perhaps ones that are currently considered to be archaic, that could fill the expressive gap. Deal's extensive research identified only two non-epistemic modals in addition to *-o'qa*, both of which are understood but not used by contemporary speakers of Nez Perce (Deal 2011). The suffix *–'és* is strictly a possibility modal, and it is used only to indicate dispositions, similarly to the English suffix *-able* (as in break*able*, ed*ible*, etc.). $-'ax$ is an archaic form that appears to be completely interchangeable with *-o'qa*, so that 19th and early 20th century translations of texts into Nez Perce are often glossed with both forms. This indicates that $-'ax$ is appropriate, and inappropriate, in the same range of translations as *-o'qa*.

[112] A major reason why there is a recalcitrant problem here is simply that *-o'qa* is a clitic morpheme, a suffix, that must be attached to a verb. Givón (1978) asserted that, in his data on translation issues drawn from several diverse languages, all serious counterexamples to translatability involved cases where various operators which modify a verb (e.g., tense, negation, adverbial or modal) are clitics which must be attached to that verb. This creates translation issues, such as the one under discussion in the main text, where in an SL such as English another operator might scope over either the verb or the first verb-modifying operator individually (because they can be separated from one another), but in the TL such operators must scope over both the verb and the clitics attached to it. One of Givón's examples of this phenomena is discussed in the next subsection.

How do Nez Perce speakers actually express root necessity in their language? Deal explains that a variety of techniques are employed when translating English sentences that express simple necessity, although Deal notes that to native speakers "[I]t is clear that the match with the intended necessity meanings is never quite perfect" (2011:577). Speakers must alter various properties of modal flavor or force, or at times broader aspects of sentence meaning, in order to approximate necessity. Deal discusses four broad strategies that are employed to these ends. These strategies are instructive to consider because they demonstrate how basic communication might take place even when fundamental semantic properties cannot be preserved under translation[113].

First, deontic necessity is sometimes expressed by an imperative sentence. Notice that in the following example, Deal's analysis predicts that translating the necessity modal *have to* using *-o'qa* is not possible, since the restriction of the universal quantifier *whatever* is a DEE. This prediction is supported here, as well as by data gathered by similar translation elicitation tasks (Deal 2011:578):

(3.43) ke-m 'isíi-nm hi-hí-n-e ku'ús ku-y 'iin wáaqo'

REL-2SG who-ERG 3SUBJ-say-P-REM.PST thus do-IMP I already

kúu-Ø-ye.

do-PREM.PST

Whatever you have to do, I already did.

[113] It is worth noting that in what follows, only means that employ the language, strictly speaking, are considered. Of course, many more resources are available to a speaker. For instance, we know that an English speaker might use a possibility modal with an appropriate tone of voice to convey necessity (e.g., "well, you might (if you know what's good for you!)"). Some such means *must* be available in Nez Perce, since tribal rules and cultural norms were promulgated before the arrival of bilingualism. It might be suggested that in some of the cases discussed here, a competent speaker of Nez Perce would understand, based on their knowledge of the situation and their interlocutor, that the speaker is trying to convey necessity, and interpret the sentences as such. Again, the question of translatability and communicability are shading into one another.

Literally: 'Whatever anyone said to you, Do thus!, I already did.'

The exact meaning and truth conditions of the English sentence and the Nez Perce translation have clearly come apart, since in the original sentence there was no mention of any verbal command. Yet this is one of the most common methods of translating English sentences conveying deontic necessity, and is often employed even when the modal is an upwards entailing environment in the SL sentence. A sign stating, "Everyone must wash their hands" becomes a Nez Perce sentence that would back-translate as "Everyone, wash your hands!"; "You have to eat the meat" becomes "Eat the meat!" (Deal 2011:577)[114].

A second strategy is to paraphrase a sentence containing a necessity modal with a simple indicative sentence. In the following representative example, a necessity modal that falls under the scope of a negation in the English source sentence, a DEE, is eliminated under translation into Nez-Perce in favor of rephrasing the sentence entirely as a future indicative (Deal 2011:578):

(3.44) Prompt: "They don't have to wait."

wéet'u hi-pa-yóoxô-yo'.

not 3SUBJ-S.PL-wait-PROSP

They won't wait.

Again, the truth conditions of the SL and TL sentences are clearly different. The English sentence has the form $\neg\Box wait$, which is not a possible construction in Nez Perce given the lack

[114] It is worth mentioning that it is not inconceivable to analyze imperatives and deontic modals as expressing the same proposition. For instance, Katz (1972) argued, albeit somewhat vaguely, that imperatives express propositions. Therefore, Deal's argument might be said to rest on a certain analysis of the granularity of propositions, or on something like Keenan's stipulation that exact translations must preserve "sameness of speech act" (1978:167). However, it might be noted that these assumptions are not improbable, and that even if they are ruled out the use of imperatives is not possible in every situation, so that there is would still be a translatability gap between Nez Perce and English (just not as widespread of one).

of a non-epistemic □. It is not possible to translate this into Nez Perce as a sentence of the form ◊ $\neg wait$ because, as discussed previously, the negation operator wéet'u must scope over the verb to which the possibility modal suffix *-o'qa* would be attached, and so the suffix cannot possibly be outside of the negation's scope. Therefore, the informant tasked with the translation has simply eliminated the modal in favor of a bare statement of fact.

A third technique involves the use of causative verbs to convey negated deontic necessity. In order to communicate that a certain action is not obligatory, the speaker indicates that the addressee is not being made, or caused, to perform that action, even when there is nothing about cause or permission mentioned in the sentence being translated. In the following example, a deontic necessity modal is under the scope of a negation in the SL sentence (compare to (3.41)) (Deal 2011:579):

(3.45) Context: I tell someone my number and I see that they are trying to remember it. I say,

"You don't have to remember it; here's my card."

wéet'u	'ee	sepée-tmipni-se-∅;	kii	wee-s-∅	tíim'es.
not	you	CAUS-remember-IMPF-PRES	DEM	be-P-PRES	paper

'I'm not making you remember it; here you have a paper.' (Deal 2011: 579)

The fourth translation strategy that Deal catalogs is to paraphrase the sentence so that only possibility modals are used. In the following, the English sentence has the necessity modal *have* in the antecedent of a conditional, which is a non-monotone environment, meaning that it although it is not downwards entailing it is not upwards entailing either, and therefore scalar implicatures do not obtain. The Nez Perce informant noted that although *have to* is translated by *-no'qa*, it can have only a possibility meaning in this environment, and so the informant rejected

the translation Deal proposed, noting that the modal would receive a possibility reading (Deal 2011:576):

(3.46) Prompt: If I have to call the doctor, I will.

#c'alawi 'a-múu-**no'qa** saykiptaw'atóo-na, kaa 'e-múu-nu'.

if 3OBJ-call-MOD doctor-OBJ then 3OBJ-call-PROSP

Consultant: 'You could say that, but I don't know how you would say that to mean if you NEEDED the doctor … you're just saying that if I could call the doctor, I would.'

A very similar English sentence (identical except for the use of "need" instead of "have to") was translated by restructuring the antecedent of the conditional to make the use of a possibility modal appropriate (Deal 2011:580):

(3.47) Prompt: If I need to call the doctor, I will.

c'alawí saykiptaw'atóo-nm hi-wapayata-**yo'qa** kaa 'e-múu-nu'.

If doctor-ERG 3SUBJ-help-MOD then 3OBJ-call-PROS

If the doctor could help me, then I will call him.

The focus in this subsection has been on translating from English into Nez Perce, because it is in this direction that there is most clearly an expressive gap, but I will conclude with a quick note about translation in the opposite direction. As previously mentioned (in the last subsection), *-o'qa* is occasionally translated into English as a necessity modal, despite apparently not having this meaning in the SL. Deal (2011,2014) explains this fact through the different implicatures licensed by English and Nez Perce possibility models; the case runs parallel to the discussion of $\exists nglish$ in the previous section. Despite this occasional flexibility in translation, the evidence shows *-o'qa* to be strictly a possibility modal, that is, it means $\Diamond$ and nothing else, and in

particular not □. But a possibility modal is compatible with necessity, and if the possibility modal has no dual, or scalemate, then we would expect it to occur in situations in which a necessity modal would be used if available (in the way that $\exists nglish$ uses *some* where *all* is more *accurate*). In English, because of scalar implicature, $\Diamond\varphi$ is, barring special circumstances, understood to mean $\Diamond\varphi \wedge \neg \Box \varphi$, a fact which a bilingual translators are aware of, even though no such implication is present in Nez Perce. To avoid conveying the implication of $\neg \Box \varphi$ when it would be inappropriate, $-o'qa$ is translated into English as a necessity modal, even though this is an approximation. Rather than something being lost in the translation, an element- an implication- not present in the SL, is being introduced.

3.3 Discussion

As the examples in the previous section demonstrate, Nez Perce is a serious challenge for translatability. In some cases, the best translations from English offered by bilingual informants show differences, relative to the SL sentences, not only at the level of presupposition structures but to the core truth-conditional content. This signals a counterexample not only to Katz's ***T***, but also to much weaker translatability theses, such as ***T'***. In fact, data points such as (3.43) or (3.47) seem to put pressure on the idea that universal translatability at the semantic level can obtain in any non-trivial sense.

Of course, any such results constitute inductive evidence, rather than deductive proof, as is the case with the vast majority of counterexamples to translatability. As Keenan noted at the outset of his argument against Katz, the sentences of any NL are infinite, and there is no way to conclusively establish that, given enough time, bilingual speakers could not produce better translations than the subjects of field surveys or elicitation experiments were able to come up

with in the examining linguist's presence. However, there is a very high degree of inductive probability that there are English sentences which have no truth conditionally equivalent counterpart in Nez Perce. The translation gap with relation to English is caused by the absence in the TL of a lexical item which, in NLs where an equivalent exists, is part of a closed class and covers a significant part of modal space. Further, the most obvious method for overcoming this lacuna is conclusively ruled out by the syntactical properties of negation in Nez Perce. These factors, along with the nature of the methods that the speakers actually employ to discuss non-epistemic necessity in Nez Perce, make it very unlikely that there is any truth-conditionally equivalent translation available without actually changing the target language. This last option, of extending the TL, is not a simple matter of introducing a new word. Since the gap concerns a closed class clitic, closing the gap by introducing a neologism would represent a major alteration. These considerations indicate that translation from English into Nez Perce is at E_2 for both $\boldsymbol{T}$ and $\boldsymbol{T}'$.

Translation in the other direction faces the less severe limitation that, given a Nez Perce text, a translator faced with a use of *-o'qa* in an upwards entailing environment would not know, without some contextual knowledge, whether the modal should be translated as possibility or necessity. Thus, information that is contextual in the SL must be made explicit in the TL (yet another example of the difficulty that Jakobson had flagged). By analogy with the cases discussed in §§1 and 2 of the present chapter, this would seem to indicate that there would be problems with preserving presupposition structures. Therefore, translation from Nez Perce into English might potentially be problematic for $\boldsymbol{T}$, but not for $\boldsymbol{T}'$ (but there might be other serious issues here, see the discussion of Gitksan, below).

In discussing fieldwork, Deal noted that researchers typically accept two methodological principles, at least implicitly:

> **Equivalent Translation Hypothesis (ETH)**: The input to translation and the output to translation are equivalent in meaning. (Deal 2014:2)
>
> **Equivalent Judgement Hypothesis (EJH)**: In a particular context, speakers accept/reject sentences expressing the same range of propositions regardless of what language they are speaking. (Deal 2014:3)

Deal concluded, partly on the basis of her own fieldwork experience discussed in the previous two sections, that the ETH cannot be trusted. The TL may not have an equivalent sentence available, but the informant will often volunteer as a translation the best approximation that they can come up come up with.

What this seems to indicate is that failures of translatability may be much more widespread than is commonly assumed. In some of the examples we have discussed, an informant lacking a background in linguistics or philosophy of language might not even be aware that they are offering up a semantically non-equivalent sentence; this will be especially true when, pragmatically, the two sentences fulfill the same communicative role in context. In other cases, the informant may be aware of some difference, but are trying to be helpful by offering the best translation they can think of (recall that Deal's informants sometimes reported, when queried, that something was a bit off in their translations). Thus, surveys of understudied languages might be replete with counterexamples that would only come to light with the sort of detailed analysis that Deal's work involved.

Further, it seems that even the seemingly commonsense EJH is subject to counterexamples. Deal (2014) discusses the specific case of Gitksan, a language with a modal system similar to Nez Perce in that it lacks a root necessity modal (but without the specific syntactic features that prevent $\Diamond\neg$ from being used to express $\neg\,\Box$). Bilingual speakers of that language have been observed to accept Gitksan sentences containing a possibility modal but to reject the English equivalent because the context is more appropriate for a sentence with a necessity modal. The different judgements are attributable to the presence of scalar implicatures in English, but not in Gitksan.

Given Deal's results with Nez Perce, an important question at this point is how widespread these sort of deep translation gaps, at the level of truth-conditional content, might be between pairs of NLs. On the one hand, the fact that this counterexample emerged four decades into the debate on Katz's ***T*** seems to indicate that they must be fairly rare. Keenan's most extended criticism of Katz drew on evidence from forty languages without identifying issues beyond the level of presuppositions and open-class vocabulary items (Keenan 1978, data published in 1975,1975a,1975b). Nez Perce and English might represent a rare or even unique instance where a combination of semantic and syntactic features result in a more basic failure of translatability. Certainly, other languages (e.g., St'at'imcets, Gitksan) have modal systems which contain gaps relative to English in ways relevantly similar to Nez Perce (Matthewson 2016; Matthewson et al 2007; Rullman et al 2008), but without causing translation issues beyond the level of presuppositions (see fn 25).

On the other hand, the fact that this counterexample has only recently come to light may represent a shift in the approach used by researchers, rather than indicating that the result is a rarity. First, Keenan's argument was almost entirely focused on entailments, which he saw as a

more tractable property of sentences than truth conditions for most purposes (Keenan 1974). It is possible that this analysis would have caused him to identify cases of presupposition failure and not to detect other sorts of issues. Another difference between the work of Deal and Keenan (and to lesser extent the survey work of von Fintel and Matthewson) is that rather than drawing on the comparison of some feature (e.g., switch reference) across many NLs, Deal's data was the cumulation of many years of intense study of a single languages. Besides this, constructing her case required access to a detailed theory about the taxonomy of modals (Kratzer 1991) that was robust enough to handle crosslinguistic data; such empirically informed but technically precise semantic theories are a relatively recent phenomena.

These considerations lead to the expectation that as many currently understudied languages are subjected to this kind of analysis, more such cases will begin to emerge. Although the exact number of NLs spoken today is a matter of dispute[115], it is likely in the order of 7,000, indicating some 49 million language pairs; the number of human NLs that has ever existed is likely in the order of 100,000, indicating about ten billion possible combinations. Translations have been carried out between a small minority of this number, let alone recorded translations, and detailed studies of the limits of translatability on only a vanishingly miniscule fraction. This seems to indicate that there are likely many more pairs that share the sort of issues obtaining between English and Nez Perce.

Givón (1978) presented a case, that of translating from English into the indigenous Mexican language Yaqui. The problem here is similar to that of Nez Perce, in that it stems from the interaction of clitic modals with the scope of negations. Although the investigation and

[115] This probably not an issue that can be resolved, as will be discussed in the next chapter.

discussion are not nearly as thorough as Deal's work with Nez Perce, the case is intriguing as it seems to indicate a translation gap that must be fairly widespread.

The quandary for the translator concerns verbs used to modify other verbs- which Givón refers to as *modal verbs*- such as "'want', 'begin', 'end', 'succeed', 'fail', 'intend', 'refuse', 'plan', etc." (Givón 1978:269). Many of these verbs which are free morphemes in English are, in Yaqui, suffixes attached to a main verb. In this respect, Yaqui is typologically similar to Nez Perce, and this is a feature shared by many of the world's languages, i.e., those classified as agglomerative or polysynthetic. For example,

(3.48) itom asoa tekipanoa-bae

Our son work-want

Our son wants to work. (Givón 1978: 270)

Consideration of the syntax of this sentence shows that some constructions available in English are impossible in Yaqui, such as "What he started to do then was work", because in Yaqui, *tekipanoa*, meaning *work*, and the suffix *-taite*, meaning *start*, cannot be arranged so that other words can be placed in between them (Givón 1978:270-271).

In Yaqui, the negation operator *kaa* must occur at the start of the verb phrase, so, as in Nez Perce, it must occur to the left of the verb and scopes over everything to the right. This seems to indicate, if alternate constructions are not available, that there must be very widespread translation issues between English and Yaqui, since negation cannot scope over either the verb or modal suffix separately but must take both together in its scope. That is, ¬(*verb-modal*) is a grammatical construction in Yaqui, but not *verb* ¬*modal* or *modal* ¬*verb*. Givón suggests that this will at times result in semantically significant failures of translatability. For example, in the

following pairs of sentences, only (3.49a) can be directly translated (without paraphrase or other modification) into Yaqui (Givón 1978:271):

(3.49) a. He did not start doing his homework.

b. He started not doing his homework.

This is because that language cannot place a negation between the verb that would translate *doing homework* and the suffix that would indicate *start*.

Of course, a more thorough investigation into Givón's claims regarding Yaqui would be desirable, especially concerning the available options of paraphrase or alternate constructions[116]. But the fact that two entirely unrelated languages share the relevant syntactical features that cause translation gaps- clitics used to cover important parts of the semantic space and a negation operator that must occur to the left of the verb- indicate that it is very unlikely that the English/Nez Perce situation is a "one-off". Deal, citing Givón's work as an example, suggests that "Restrictions on the scope of negation may in general engender differences in expressive power across languages" (2011:274 fn).

This section will close with a brief review of Deal's own interpretation of her results, already mentioned in §5 of the previous chapter. In her original (2011) report on modal

[116] At this point, it is worth noting the depth of Deal's analysis as compared to that of Givón's. Deal published a lengthy monograph on a single aspect of English/Nez Perce translatability. Her conclusions represented years of work; alternate constructions and translation strategies are carefully examined, and thorough textual and corpus studies were conducted in conjunction with elicitation tasks. The same is true of Matthewson's work on presuppositions in Salish languages. To be fair to Givón, the discussion of Yaqui, which consisted of about a page in total, was never presented as conclusive, and it was contained in a survey work that was intended to suggest the types of untranslatability that might obtain between typologically different languages. However, the extent of the analysis which Deal and Matthewson provide indicates that it is no simple matter to establish untranslatability, and their work should be compared with that of some other well-known authors. Notably, Everett (2005) asserted Pirahã to be radically untranslatable into English in numerous aspects. None of these alleged translation gaps received, at least in any published work, anything like the in-depth examination that Deal and Matthewson provide. This suggests that Everett, and others who make similarly sweeping claims, might be making overly hasty statements (Everett will be discussed further in §6 of this chapter).

vocabulary in Nez Perce, Deal stated that her work joined an expanding body of evidence that included Keenan, Matthewson and Bittner (discussed in the next section) in what she called an "unambiguous assault" on the positions of Katz and Jakobson (Deal 2011:577). In other words, work like hers amounted to an empirical refutation of ***T*** and ***T'***.

Deal later (2014) came to a more measured conclusion. Results like those she reported concerning Nez Perce are a nothing more, nothing less, than a report on the performance of certain subjects at a given time. Although such data provides, at an inductive level, insight into what sorts of meanings can be conveyed directly and exactly by speakers of a particular language, it cannot provide a final word on the expressive power of a given language. Given enough time, speakers from any linguistic community will find a way to express any meaning, if necessary by modifying or extending the language itself. She noted that it was this idea, that in the long term speakers will always find a way, that Jakobson was advocating, and that her findings were therefore compatible with translatability[117].

On the one hand, this might seem like a surprising conclusion. Although Nez Perce speakers may well be able to employ pragmatic resources to express whatever message they intend to convey (see fn 30), Deal's own data indicates that in order to capture that meaning at the literal semantic level would require adding a new closed-class item to the language. To erase the expressive gap that Givón reports for Yaqui would require a drastic reorganization of the language, at the syntactical level, resulting in, arguably, a completely different language. But, on the other hand, it is an important- perhaps a defining feature- of human languages that such extensions or reorganizations are possible (see chapter II, §5). Indeed, such growth occurs

[117] Deal (2014) does not discuss Katz directly, and he has only a brief mention in her work (2011). It is possible that she was not as familiar or as concerned with Katz, as opposed to Jakobson, whose views she cited as having a foundational status in her education as a linguist (Deal 2014).

naturally as a part of language evolution, and theoretically the process could be accelerated if a need arose.

These considerations are advancing us towards themes that will be considered in the next chapter. But before we move on to these, we should first consider some further alleged counterexamples to translatability, beginning with the third author cited by Deal as a counterexample to Jakobson, Mariah Bittner.

§4 Tense and Translation

This section will, in somewhat less detail than the previous two sections, consider a further possible counterexample to translatability, this one concerning issues that might arise between NLs that have different means to conveying temporal information. In particular, we will examine the case of translation from English into Kalaallisut, aka. West Greenlandic, an Inuit language.

This might strike the reader as a somewhat pointless exercise at this point. ***T*** seems to have already sustained fatal counterexamples from Salish and Hopi, due to the requirements that entailment relations be exactly preserved, to include the presupposition/assertion dichotomy. The data from Nez Perce and possibly Yaqui point to issues at a deeper level, ruling out weaker translatability theses such as ***T′***. Since reasonably convincing counterexamples have already been introduced to the discussion, it may seem of questionable value to go on to examine more cases.

There are at least two reasons for discussing further proposed counterexamples. First, none of the known cases can be judged to be absolutely conclusive. The analysis of linguistic data is a very complex matter, and reasonable theorists will often come to different conclusions

about the same body of empirical evidence[118]. As Keenan recognized, the more possible types of counterexample that can be proposed, the higher the degree of inductive probability that translatability is not a universal property of NLs. So, it is of interest to us to identify as many different sorts of cases as possible.

Secondly, it is of theoretical interest to know in what ways translatability fails. Probing at the limits of translatability and mapping out cases of failure helps us to outline the semantic universals, if any, that are common to all NLs. This helps us to better understand the role, if any, of semantics in a theory of universal grammar, and, at an even more fundamental level, the relation of semantics to human thought. We may be able to identify semantic parameters along the lines of the well-known syntactic parameters that played a large role in the development of Chomskyan linguistic theory, and which continue to be a central aspect of many contemporary manifestations of that theory (e.g., Baker 2001). Indeed, this idea of semantic parameters has figured prominently in the work of Matthewson (1998,2006) and von Fintel and Matthewson (2008). Considering individual cases, and ways in which speakers might still convey meanings where their language has an expressive gap, might shed light on the interaction of the semantic level of language use with the syntactic and pragmatic levels, and ways in which this interaction might vary between linguistic communities. Or it may even demonstrate that there is no reason for a theory to differentiate these levels.

It should be noted that the material in this section differs from all of that previously discussed in this chapter in that it is drawn from sources which discussed interlinguistic variation but were not specifically concerned with translatability. There is therefore a degree of non-expert

[118] It is worth noting that, of the authors discussed so far, those who advocate translatability, and especially Katz, put their conclusion in the form of firm principles that have the status of definitional scientific laws, while those who propose counterexamples present their results in the more cautious terms of theories and hypotheses. Exceptions to this rule are two authors who will be discussed later in this chapter, Everett and Levinson.

extrapolation involved in my analysis of the data. However, Bittner and her work on Kalaallisut was cited by Deal (2011) as a counterexample to Jakobson, and it can be safely assumed that Deal was well qualified to make this assessment.

§4.1 English, Kalaallisut and *Harry Potter*

A deep failure of translatability may exist between tensed languages such as English and some languages that are partially or fully tenseless. An extreme example is Kalaallisut (West Greenlandic), which has been argued to lack any tense markers at all, even under very inclusive criteria for what might count as such (Bittner 2005). Although, like all Inuit languages, Kalaallisut is highly inflectional and polysynthetic, it does not mark temporal displacement through inflection. Nor does it employ future modal auxiliaries analogous to the English *will* or constructions such as *was going to*. In respect to temporal reference, Kalaallisut has been described as representing the opposite typological extreme from English (Bittner 2007)[119].

Kalaallisut speakers do talk about the past and future[120]. To discuss temporally distant events, Kalaallisut speakers deploy a variety of circuitous means which can express temporal

[119] As a quick review, English overtly marks the past tense through verbal inflection (e.g., "walk*ed*" as compared to present tense "walk"). Future tense is not marked by verbal inflection, rather, certain auxiliary verbs are employed, e.g., "*will* walk". Bittner's point is that Kalaallisut does not have any markings, either lexical, morphological, or otherwise, for distinguishing past, present or future, making it the opposite of English in this respect.

[120] If this seems like it should be hardly worth mentioning, it has been asserted at times that speakers of various languages can only discuss the present. This has been claimed of the purportedly "timeless" Hopi, and although never asserted by any reputable scholar the story persists (this case will be discussed in the next subsection). More recently, it has been claimed that the Pirahã of Brazil live in a sort of continual "now", and their language supposedly reflects this fact (Everett 2005). Although the Pirahã will be discussed in §6, this particular aspect of their language will not be covered due to space. Everett attributes all of the particularities of the Pirahã language, including the lack of recursion, on a unique lack of concern for anything besides the concrete here and now. For a critique of this assessment, see the commentary in Everett 2005 as well as Nevins et al. 2009,2009a.

information “as precisely as the English tenses” (Bittner 2005:349). But, although both languages can express temporal displacement, the means with which they do so appear to create a translation gap passing from English into Kalaallisut. A translator with the relevant background knowledge can produce a TL equivalent that will convey the same point in a given context, but the semantic properties of the translation will often diverge quite far from those of the SL original.

When discussing the past in Kalaallisut, although tense is not explicitly marked by inflection, it is “predictable based on aspect and the context” (Bittner 2005:345). When referring to events, this is accomplished by the use of certain clitics that mark the event as factual or which signal the indicative mood used for asserting facts. An interlocutor familiar with Kalaallisut discourse will employ pragmatic reasoning to infer that the event must have occurred in the past because speakers of that language report only past events as factual. A sentence not concerned with reporting the occurrence of specific events is always understood to be discussing the time of utterance unless the context is shifted. Consider the following data (Bittner 2005:346):

(3.50) Juuna iqqssi-sima-llu-ni sinip-pu-q
Juuna calm.down-prf-ELA-s sleep-IND.IV-3s
Juuna is sleeping peacefully.

Taken by itself, (3.50) is understood as discussing a state which holds at present. The very same sentence is taken to be discussing the past when it is placed in the following context:

(3.51) Taar-si-riir-m-at angirlar-pu-nga Juuna iqqssi-sima-llu-ni
be.dark-become-be.already-FCT-3s come.home-IND.IV-1S Juuna calm.down-prf-ELA
sinip-pu-q

sleep-IND.IV-3s

I came home after dark. Juuna was sleeping peacefully.

At the start of (3.51), the event-predicate *-si*, *become*, is combined with the factive clitic *m*. This indicates that a past time is under discussion, since the event being described is reported as a fact. In this context, the second half of the Kalaallisut is also understood to be in the past, despite that fact that it is identical to (3.50). Notice that we have already encountered translation issues. Because (3.50) describes a state rather than event, it, by itself, cannot be placed in the past by being reported as a fact. To express the meaning of the English sentence "Juuna *was* sleeping peacefully" would require either a redescription in terms of events (e.g., "Juuna had fallen asleep") or the addition of further content, along the lines of (3.51).

Translation of future tensed English sentences demonstrates an even more pronounced lacuna. Bittner (2005) identifies three methods which are employed to translate the auxiliaries used in English to denote future tense. These methods are each displayed in the discussion of the following data, all of which was gathered from the Kalaallisut translations of contemporary English language novels (e.g., *Harry Potter*). This work was carried out by professional translators who we may assume had the knowledge necessary to give the most accurate possible translations in most cases.

As a first option, a future tensed sentence of English can be rephrased in Kalaallisut by describing current attitude states oriented towards future events. This technique, which Bittner calls *prospective statives* (2005:353), is the most common method employed to render future tensed sentences into Kalaallisut. In the following example, since there is no equivalent in the TL of the future auxiliary construction *going to*, it is replaced by the equivalent of the attitude verb *expect* (Bittner 2005:352):

(3.52) English: “I’m going to have a lot of fun with Dudley this summer.”

Translation:

Ilimaga-a-ra aasaq manna Dudley quianar-tur-si-vvigi-ssa-llu-gu

expect-IND.TV-1s.3s summer this Dudley be.fun-iv\cn-get-from-expect-ELA-3s

I expect to get some fun out of Dudley this summer. (Bittner 2005: 352).

It might be argued that the English sentence really means that the speaker *expects* to have fun with Dudley this summer, and this is the content of the sentence at the level of *what is said*, i.e., how the meaning of (3.52) would be summed up in an indirect report. Such an inference would be licensed by the fact that, of course, the speaker cannot actually foretell the future, and both speaker and addressee would be expected to know this. It could be argued that this inference is a pragmatic one, based on extralinguistic knowledge, and no part of the semantic meaning of the English sentence (3.52), but it seems that, once again, these aspects of meaning are highly entangled.

The following is a more complex but highly illustrative example of the same translation strategy. Notice that *we would*, a bare statement of a future fact, is translated both times that it occurs by *ssamaar*, which means literally *plan*, or in the indicative voice used here, *planned*, a mental or attitude state that can be shared by several agents. (Bittner 2005:369):

(3.53) English: “We would meet again in Ilkuma. Then we would pack two big sleds and take the trail back to Norton Sound and Womengo.”

Translation:

Ikuma-mi taku-qqi-ssamaar-pu-gut Taava-lu puurtu-i-riar-lu-ta

Ikuma-sg.LOC see-again-plan-IND.IV-1p then-and pack-pass-quickjly-ELA-1p

Womengo-mut uti-ssamaar-pu-gut

Womengo-sg.DAT return-plan-IND.IV-1p

We planned to meet again in Ikumu. And then, after quickly packing up, we planned to return to Womengo.

A second method, which Bittner terms *prospective inchoatives* (2005:352) involves describing a future action, one that has not yet begun, as an action taking place in the present and which has already been started. The following is an example (Bittner 2005:352-353):

(3.54) English: "Yessir! I'll bring him right over!"

Translation:

Aap, akka Aggiuti-lir-pa-ra!

yes uncle bring-begin-IND.TV-1s.3s

Yes, Uncle. I'm coming with him.

Note that in (3.54) the complex Kalaallisut word that best translates back into English as *I'm coming with him* is formed using suffixes which indicate that the event of beginning the action of bringing is now in the past (since it is being reported in the indicative mood).

Finally, a future tensed sentence can be rephrased as a wish or request, what Bittner (2005:352) calls the *prospective matrix moods* technique. The following is a clear, basic example (Bittner 2005:353):

(3.55) English: "We will feed the dogs now".

Translation:

Qimmi-t nirukkar-niar-tgik

dog-pl feed-please-IMP.1p.3p

Let us feed the dogs, ok?

In all of these cases, it seems apparent that there are important and basic differences that become evident when we compare the truth conditions of the English sentences and their Kalaallisut translations. But when we press more closely on some of them, things become less clear. Consider (3.52) and (3.53). The English sentences are future indicatives, bare factual statements that some event or action will occur at a later time, while the Kalaallisut sentences are attitude reports. But the exact truth-conditional content of a future indicative may not always be entirely clear, and if we try to isolate a literal semantic content, it probably diverges from exactly what the speaker means to express by his/her utterance on any given occasion of use. In fact, it seems somewhat questionable to assign a meaning to future indicative sentences that differs from a speaker self-reporting that they have a certain attitude of expectation towards the future.

For (3.54) and (3.55) it might seem clearer that some meaning is lost in translation. In the English (3.54) there is no indication or even implication that the action had already started, but this is explicitly asserted in the Kalaallisut. Although the English (3.55) is an indicative sentence whose force is imperative, the translation is a request. Still, we might wonder how Kalaallisut speakers typically understand these sentences, e.g., perhaps (3.54) could be commonly understood in the way that an English speaker might say "on my way!" to indicate that they will be there soon even when they haven't started yet. Again, these considerations seem to indicate that factors outside of what Katz considered to be semantics should be accounted for when assessing translatability. Still, if we stick as closely as possible to the definitions of synonymy and translation taken from Katz, this seems to be an issue where a major translation gap exists at least at the E_2 level that counts against both T and T'; that is, if no better translations are available (and Bittner argues that there are not).

On the topic of better available translations, it should be noted that Bittner's interpretation of Kalaallisut as completely tenseless is not uncontroversial[121]. For instance, the suffix *-ssa* which she glosses as *expect* had been interpreted by some previous researchers as an inflection marking future tense (Fortescue 1984). Clearly, the correct interpretation of the empirical data concerning tense systems is a highly complex matter. However, Bittner's data was drawn from an extensive survey of the published efforts of professional translators competent enough to be entrusted with commercially important works[122]. Therefore, both the volume and nature of the data lend support to her interpretation, which indicates that Kalaallisut is tenseless and has a translation lacuna relative to English.

§4.2 The Hopi Time Controversy and Other Possible Cases

There is certainly broad variation in the way that NLs locate events in time. By some estimates, as many as half of the world's languages are completely tenseless, including, by some analyses, such widely spoken languages as Mandarin (de Caen 1996). These languages form an otherwise highly heterogeneous class, members of which use a variety of means to locate temporal events, including context, aspect and use of adverbials (Tonhauser 2015). Although von Fintel and Matthewson (2008:170) caution that languages do not vary "without limit" in this respect, they also note that the only clearly identifiable universal regarding tense is that all languages can, by some means, locate the time of the events under discussion relative to the

[121] Such claims often trigger controversy, in fact, virtually every claim, to date, that a language is tenseless has been challenged by at least one rival interpretation. See Tonhauser 2015 for a broad crosslinguistic discussion.
[122] This does raise a new worry, that accurate translation was sacrificed for literary effect in these sources. Contemporary translators of literature rarely aim for a literal semantic translation, preferring to balance clarity and aesthetics when it is possible without too large of a departure from the original (the reader is referred to several articles in Baker's 2008 *Encyclopedia of Translation Studies*). But, in this case, Bittner's conclusion seems reasonably secure. She had performed an in-depth examination of the Kalaallisut translations of five fairly lengthy English language novels, and examined the translation of every future-oriented sentence that they contained. All five translations supported Bittner, but the novels varied in topic, reading level and tone enough to allay concerns that some sort of artificial literary register was being employed for all five translations.

speech time. Tonhauser (2015), drawing on an extensive survey, adds to this only that all languages so far investigated have temporal adverbials[123]. Past proposals, such as that all NLs have overt or covert tense, or that all languages must have the syntactic head T, have been subject to convincing counterexamples (von Fintel and Matthewson 2008).

All of this crosslinguistic variety would seem to indicate that there must be widespread failures of translatability between languages with very different ways of indicating temporal displacement. Caution is required for at least two reasons. First, the classification of a languages as tenseless is nearly always highly contentious, with different studies often drawing opposite conclusions (Bittner 2005; von Fintel and Matthewson 2008; Tonhauser 2015). The contested status of Bittner's conclusions about Kalaallisut is not at all unusual in this respect. Secondly, the definition of *tenseless* varies widely between different authors, and not all tenseless languages will have translation issues *vis a vis* tensed languages. For instance, Gauraní is often classified as tenseless because it is reported to lack any *obligatory* overt tense markers (Tonhauser 2011). At the same time, it has a prospective aspect marker that locates events in the future of the speech time, and an overt past tense marker which is not classified as part of a tense system because its use is not obligatory (Tonhauser 2015). Thus, although Gauraní is classified as tenseless, it is not tenseless in the strong sense that Kalaallisut is reported to be, since the language does have the grammatical means to translate exactly any tensed sentence of English. Mandarin is argued to be tenseless because, like Kalaallisut, it does not mark tense by inflection on the verb, but it does have some other overt tense markers such as future oriented model auxiliaries (e.g., *yao*, "will") that can be used to translate from tensed languages (Smith and Erbaugh 2005).

[123] A *temporal adverbial* is a word or phrase indicating the relative temporal location of the action described by a verb. Examples include the English *soon*, *yesterday*, etc.

Before moving on from the discussion of tense and translation, we should briefly discuss the famous "Hopi Time Controversy", one of the best known and widely discussed specimens of linguistic variation and alleged relativity. This is a case that illustrates all of the difficulties just discussed, and is still not fully resolved despite almost a century of study; the following is a bare sketch as a full discussion would warrant at least a chapter by itself.

What is uncontroversial is that Hopi speakers place the suffix *-ni* on verb roots when the action is expected to take place at a future time, for example (Hopi Dictionary Project 1998:898; *piki* is a type of flat corn bread):

(3.56) momoyam piktota

The woman are/were making piki.

(3.57) momoyam piktota-ni

The woman will be making piki.

The interpretation of *-ni* is debated, as we will see in a moment. But what can be immediately noted for our purposes is that the Hopi language divides events into the past and present, on the one hand, and the future on the other. English divides past from the present and future by means of inflection on verbs, and marks the future tense by means of future auxiliaries. Therefore, when translating sentences referring to past events from Hopi into English, there will always be less temporal information contained in the SL sentence than must be specified in its translation. When translating from English into Hopi, a sentence referring to the present or past would lose information on being transferred into Hopi. This will result in translation issues at the level of presuppositions, at least.

In his work on the Hopi language, Whorf argued (1938,1946,1956) that Hopi is a completely tenseless language, despite the feature just discussed. Instead, Hopi has what Whorf (1956) called *assertions*, or ways of marking a speaker's basis for knowing that an event has taken place. When using a *reportive assertion*, which is unmarked as in (3.56) above, a speaker is reporting on an event that is either ongoing or has already occurred, in other words, something that they know to have taken place or to be currently taking place. The *expective assertion*, marked by *-ni* as in (3.57), indicates that the event has not yet taken place and that the speaker expects it to occur. In addition, there is the *nomic assertion*, used for habitual events, and the *inceptive*, which does not map onto the English tense system: a verb marked for the inceptive indicates that the cause has ceased, so that it can mark either the beginning or end of an action (e.g., the flight of a thrown ball at the moment it is released from the hand, or the movement of a carried item at the moment the carrying stops).

Whorf's analysis was subjected to heavy attack by Malotki (1979), who, on the basis of a five-year immersive study published in a massive book, declared Hopi to be a tensed language, albeit one that made different distinctions than English. Malotki, in turn has been subject to severe criticism, both conceptually and methodologically (Comrie 1984; Lucy 1997; Hinton 1988; Dinwoodie 2006). The most thorough study to date, *The Hopi Dictionary Project* (1998), sided with Malotki in that it treats Hopi as a tensed language, with *-ni* as a verbal inflection for future tense; however, specialists in the classification of tense systems have sided with Whorf and treated Hopi as tenseless (Comrie 1985). Clearly, the matter is a complex one, and any

further investigation is complicated by the fact that the Hopi have recently become very recalcitrant towards outsiders learning or studying their language[124] (Hill 2002).

Whether Hopi is a tensed language or not, we might ask what the import of Whorf's claims would be, if true, for translation. Whorf notes that the Hopi suffixes "translate more or less" the English tense system, and can in turn be translated by English tenses, but the equivalence is not exact in either direction (Whorf 1938:278). Elsewhere, he states that any English rendering of a Hopi sentence that conveys temporal information is an "approximation" that express the original contents "somewhat inadequately" (Whorf 1956:58). However, Whorf's reservations about translatability had less to do with semantics, in the modern truth-conditional sense, and more to do with whether the result could adequately capture the basic Hopi conception of time, which he alleged is based on a profoundly different metaphysical framework from that of familiar European cultures.

At the purely semantic, level, there would not seem to be a serious difficulty with translation from Hopi into English. For instance, on Whorf's theory, (3.57) would be more accurately glossed as "I expect that the woman will be making piki", which may strike some English speakers as a somewhat odd way of putting things but is not grammatically problematic.

[124] The nature of the controversy is often misunderstood as concerning whether the Hopi have *any* concept of time whatsoever or words to discuss it. That they do not have any such a concept had never been the position of Whorf or of any other linguist, at least on record; this myth appears to be traceable to a satirical piece (Greenway 1964) and to have become firmly entrenched as an urban legend that was eventually attributed to Whorf (note that essentially the same thing occurred with Whorf's observation that there are three root words for snow in Greenlandic, which seems to be the origin of the "Great Eskimo Vocabulary Hoax", see Chapter 0, fn 1). This attribution is often carelessly repeated, probably because it makes an excellent strawman (e.g., Pinker 1994). A large portion of Malotki's work was aimed at proving that the Hopi have some vocabulary to discuss time, which later critics pointed out had *never* been at issue among serious scholars. What the *real* debate centered on, in summary, was Whorf's claim that the Hopi's entire metaphysical framework, including time, was fundamentally different from that of Indo-Europeans. Malotki, a psycholinguist who had been much influenced by Kantian perspectives, was seeking to establish that exactly the same concepts of time and space are innate and universal to all human beings. It is notable that both Whorf and Malotki took the Hopi language itself to provide crucial evidence, thus why there has been so much interest in whether the language is tensed.

Translation of past/present sentences would have issues at the level of presuppositions. On the other hand, translating English into Hopi would encounter serious problems of equivalency, because any English sentence discussing the future would be translated into Hopi as an attitude report, e.g., a statement expressing a bare future indicative would be translated as a statement about the speaker's beliefs regarding the future. Notice that this case is parallel to that of translating (3.52) and (3.53) into Kalaallisut using the prospective stative method, as discussed in the previous section (and the same considerations involving pragmatics and speaker meaning apply in both cases). Whether there would be an issue when translating English present/past sentences into Hopi would depend on the exact nature of the reportive assertive, that is, whether a Hopi sentence using the bare (reportive) form of verbs conveys at the semantic level that the speaker definitely has knowledge that the event has occurred, or whether this is only an implication at the pragmatic level (assuming that that the two options can be meaningfully separated).

The case of Hopi was chosen because of its fame and because it is a good illustration of the complications that might surround analysis of the data describing an allegedly tenseless language. Still, even given these complications, tense is a promising area for further investigation into translatability. Because tenseless languages rely to varying degrees on context for information that is overtly coded in tensed languages by lexical items or morphology there is a very wide scope for counterexamples to ***T*** that involve presuppositions. The case of Kalaallisut, and possibly that of Hopi as well, demonstrate that there may be counterexamples to ***T'*** in this area. It seems highly improbable that other such cases do not exist, since there is apparently so much variation in the devices used for temporal reference. This is an area that would benefit from close investigation by linguists interested in questions of translatability.

§5 Some Further Cases

This section will briefly discuss some other cases that have been mentioned in the literature on crosslinguistic semantics.

When discussing translatability, descriptions of "exotic" languages should be approached with a degree of caution. As we have seen several times already in this chapter, languages can differ dramatically in the ways that they map extra-linguistic reality into linguistic form. At time, analysis of the evidence strongly suggests that this variation does create real gaps for translation. But much of this variation is also apparently superficial, and does not indicate any real difference in the expressive power of languages. There may be a deep parallel here with syntax, and the fact that what seems at first to be an astonishing divergence among human grammars proves, on closer variation, to be tightly constrained variations on a common theme.

§5.1 Coordinate Systems and Directions

The methods available for conveying spatial directions and orientation vary between languages. Speakers of English and other European languages have both an *absolute system* of reference (the cardinal directions North, West, etc.), and an egocentric *relative system* (left, right, in front of, behind) (terminology after Levinson 1996) [125]. Some other languages have only the absolute system, and therefore have no words or phrases equivalent to *left*, *right* etc. (oddly, none has been reported to date with only the relative system). Examples include the Australian language Guugu Yimidhirr, which uses only cardinal directions (Haviland 1979), and the Mayan language Tzeltal, whose speakers orient themselves relative to the general slope of the terrain in

[125] In fact, all languages with more than a few thousand speakers have both systems, with the sole exception of Tzeltal which has over a half million. This led Li and Gleitman (2002) to suggest that languages with only an absolute system evolve in small communities where some prominent landmark is always visible. Levinson argued against this explanation, partly based on the counterexample of Tzeltal (Levinson et al. 2002)

their homeland and give directions relative to *aijk'ol*, meaning *in the* uphill *direction* (roughly north) or *alan*, *in the downhill direction* (south) (Brown and Levinson 1993). For speakers of such languages, the means employed to indicate directions and relative orientations will differ from those employed by speakers of English or other Indo-European languages who have egocentric terms at their disposal. For instance, in setting places around a square table, an English speaker might say "place the knives to the left of the plates." Giving this instruction in Guugu Yimidhirr would be complex, e.g., it would require a long series of instructions equivalent to "place the knife to the east of the plate on the south edge of the table, to the north on the west edge…" (Brown and Levinson 1993).

Although the same instruction is being provided, it might be questioned whether the two statements are really equivalent. The Australian language utterance is relying on the context of the discourse (the orientation of the table in space) in a way that the English statement is not, and requires contextual knowledge (which way is north) to correctly follow in a way that the English does not. This has led to the claim that (Bloom and Keil 2001:357):

> Phrases such as 'take the first right turn' are simply untranslatable into Tzeltal; there is no way for that language to express spatial notions that are entirely independent of absolute location.

Evaluating this claim is instructive, as it sheds light on several aspects of translatability. Any given utterance of "take the first right turn" is translatable into, say, Tzeltal. This is because, given the context of utterance, it would always be possible to transform the uttered sentence into a Tzeltal utterance- provided the translator has an appropriate knowledge of the context[126]. Thus,

[126] It has been reported that Tzeltal speakers have an uncanny ability to know which way is uphill, or north, even in an unfamiliar environment, indoors, or at night (Brown and Levinson 1993). Levinson (2002) conducted experiments on Guugu Yimidhirr speakers, who remained oriented to their absolute frame of reference even when

we have a somewhat odd situation where most *utterances* of a sentence are translatable, but the *sentence* itself, removed from any context, is not. This is a concrete illustration of the fact- alluded to at several points already- that even when there is a semantic failure of translatability, speakers will be able to find a way to communicate the point (even if this requires supplementing their nonlinguistic knowledge about the context).

The exact interpretation of this result will depend on one's semantic theory. One aspect of Katz's theory of language is that the semantic properties of a sentence- those which must be preserved under translation- are the information available in the *null context*, that is, "what an ideal speaker would know about a sentence when no information is available about its context" (Katz1977:14). Katz suggest that a useful approximation of the null context is an anonymous postcard that one finds lying around[127]. Therefore, on Katz's own theory of meaning, this seems to be a problem for ***T***, since a translator would have no way of picking up an anonymous note saying, "take the first right turn" and translating the phrase into Tzeltal without appealing to some sort of extralinguistic knowledge (e.g.,"the side of the body most people write with"). Of course, Katz could respond that the vocabulary of the TL could simply be extended to fill the gap. In principle, this is correct, and it is important fact about human language and psychology

in a windowless room. Of course, such abilities have limits, but there are also situations where an English speaker can lose track of left/right. One might ask whether there is a principled distinction to be drawn between a disoriented speaker of Tzeltal and an exhausted boxer who cannot make sense of the coach's instruction to "slip left".

[127] Notice that definition is not entirely consistent with that in terms of ***K***. For instance, in §1.3 we saw how a Katzian could argue that the difference between French sentences using *tu* and *vu* falls outside of ***K***, but notice that if one found the message "tu et malade" written on a scrap of paper one immediately knows something about the relation between the writer and addressee, and further that the relation is different from what one would be implied if *vu* was used instead. A similar point was made by Gadzar (1972), concerning Katz's own example of the pair *rabbit* and *bunny*. According to Katz, the difference between these words does not involve their meaning, but Rather in what context it is appropriate to use them, and so is not only extra-semantic but extra-linguistic. Gadzar argued that this is incorrect, since if one found an anonymous message where *bunny* was used, one would know that the intended addressee was a child. This suggests that facts about the appropriate context of use, including the intended addressee, are part of the meaning encoded by a lexical item. This indicates that even if a meaningful distinction can be drawn between semantics and pragmatics, the idea of a null context is not a suitable tool for doing so.

that a Tzeltal speaker could be taught how to talk about the difference between right and left in a short amount of time[128]. But, in practice, although directional terms such as right are nonfunctional and so open-class vocabulary, it is no small matter to add them to a language, especially if it would require introducing an entirely new coordinate system (compare to the case of adding numbers to an anumeric language).

Another way of analyzing the result is with Kaplan's (1977) two tier theory of meaning. As a quick reminder, Kaplan's influential theory holds that sentences have a *character*, or a set of formal properties that are constant across all contexts, which in combination with a context yields a truth-evaluable *content* for a given utterance of that sentence[129]. The situation of trying to translate "take the first right turn" into Tzeltal is somewhat odd, because the character of the sentence is obviously untranslatable, yet the contents of a given utterance are perfectly conveyable in the target language (this is, once again, assuming that the translator has sufficient knowledge of the context).

Of course, even if the translator is not oriented enough to translate the message into an absolute coordinate frame, they have ways of getting the point across. For example, "walk to the first turn on the opposite side from your heart/on side of the hand you use to write with/on this side", with the last option said while touching the right arm and possibly marking it somehow. It is fairly clear that these are not preserving the semantic contents of "take the first right", and the

[128] Granted, to my knowledge at least, this has never been tried under controlled condition, but the fact that many, perhaps most, Tzeltal speakers are bilingual in Spanish to some extent can be regarded as a sort of natural experiment along these lines. Li an Gleitman (2002) assert that both systems of reference are inherent, with the relative frame extending far back in our evolutionary lineage (which makes it odd that the absolute system is sometimes found by itself, without the relative system, but the converse has never been observed). Among other results, they report being able to manipulate experimental conditions so as to cause English speaking subjects to switch to the absolute system even on a small scale where the relative is typically used (but see Levinson 2002 for an alternate explanation of their results).

[129] Of course, considered literally, "take the first right turn" is an imperative and so does not really have truth conditions, nor does it express a proposition. For simplicity I am treating it here as expressing the proposition "the way to get to x is by taking the first right turn".

fact that such means must be resorted to is an indicator that translatability is failing. At the same time, they again demonstrate that a speaker will almost always be able to find a way to transmit their message, regardless of the limitations of their language.

§5.2 Translation and the Logic of Natural Language

One intriguing area to consider is whether some human languages might have different underlying logics, to the extent that they may not be mutually translatable. It is not a matter of dispute that languages have different logical vocabulary, for instance, Jakobson discussed the case of the Samoyed language that used only a single sentential connective that could mean either conjunction or disjunction depending on the context (Jakobson 1959, see Chapter II §1.2). A few further cases will be reviewed below. What has been a subject of sometimes intense controversy is what conclusion to draw from this. Some maintain that the difference is only on the surface, and underneath a single (classical) logic governs the interpretation of the sentences of all languages. Others argue that some languages must be interpreted differently, so that different patterns of inference emerge. Clearly, this latter possibility would have severe consequences for translatability, as patterns of entailment might be very different between the SL and TL.

Languages vary greatly in the extent of their quantificational vocabulary (even leaving aside modals, see §3). Although existential and universal quantifiers appear to be linguistic universals (with the possible exception of Pirahã, see below), one cross linguistic survey reported that some two-thirds of the languages examined had no strong quantifier other than a term for *all*[130] (Matthewson 2004). In fact, it has been claimed that "almost no" languages outside of

[130] S*trong* quantifiers include *all*, *most*, *at least half*, *the majority*, and so on. Weak quantifiers include *some*, *no*, *at least one, a few*, and so on. The easiest diagnostic test to identify members of the two classes is that weak

familiar European ones have a morpheme corresponding to the English *most* (von Fintel and Matthewson 2008). Yet, in all cases examined to date (again, with the possible exception of Pirahã), there is no translatability issue, because semantic devices are available to fill the gap; this might be expected, as it would be a surprising claim that a NL had no means to identify the larger part of a given set. For instance, nominalization of the word for *big* to express *most* is observed in Malagasy, Hausa, Swahili and possibly Pirahã, and appears to be a common feature among diverse languages. von Fintel and Matthewson argue that the difference between this construction and one using a specific proportional quantifier for *most* is not semantically significant, as the resulting sentences have identical truth conditions.

As observed previously, languages can also differ in their logical connectives. An extreme example, relative to English, is Maricopa, which has been asserted to lack any sort of sentential connectives, both overtly and at the level of logical form (Gil 1991; the same claim has been made for Pirahã, to be discussed in the next section). Instead, both disjunction and conjunction are expressed by simple concatenation, with the specific interpretation of an utterance necessitating "extra-grammatical means", i.e., context and a general understanding of the speaker's intent (Gil 1991:97). This was
presented by at least one study, that of Gil (1991) as having far reaching effects: classical logic was said
to be inapplicable to Maricopa!

Consider the following Maricopa sentences (Gil 1991:99,102):

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quantifiers can be used in existential sentences, that is, embedded under "there are/were/is" (Partee 2008) e.g., *"There are all the cats in the car" vs. "There are some cats in the car". More generally, strong quantifiers are used when the domain is familiar to the interlocutors or has been previously referenced. It has been argued that there is a syntactic differences between the two classes (Hsaing-Hua et al. 2004). However, the extent to which is this is a clear dichotomy and how applicable it is cross-linguistically is somewhat controversial (Guerts 2005).

(3.58) Johns Bills v7aawuum

John-nom Bill-nom 3-come-pl-fut

John and Bill will come.

(3.59) John Bills v7aaquumsaa

John-nom Bill-nm 3-come-pl-fut-infer

John or Bill will come.

These two sentences are identical, aside from the suffix *-saa*, which Gil glosses as a possibility modal and signals that (3.59) is to be interpreted as disjunction. According to Gil, there are no uniform methods for expressing either conjunction or disjunction in Maricopa. For instance, the proposition that John and Bill will come might be expressed by a bare concatenation as in (3.58), or by the use of both concatenation and the verb *uoaak*, accompany, or *teevk*, be together, or the to-be verb *ñiouum*. Gil reports that bilingual Maricopa informants volunteered all of these constructions as translations of (3.58).

It seems that if Maricopa has no specific constructions corresponding to *and* and *or*, instead leaving this information to be inferred from either paraphrase or context, there will be frequent semantic differences between a large range of Maricopa sentences and their equivalents in other languages. In a Maricopa sentence meant to convey a conjunction, the conjunction will either be left entirely up to context to convey (in the case of bare concatenation) or will be signaled by the use of a verb such as those listed in the previous paragraph, in which case the verb acts as a presupposition trigger indicating that a conjunction is implied. In either case, something is being left unsaid that is asserted in English and similar languages by the overt use of a conjunction such as *and*. Going in the inverse direction, from English to Maricopa, would

require either replacing an assertion with a presupposition or entirely omitting some key information. In either case, the truth conditions of the SL and TL sentences are different, and one language is relying on pragmatic effects to convey information that is semantically conveyed in the other. Similarly, because the Maricopa sentence in (3.59) contains a possibility modal but the English sentence does not, the truth conditions of the two will come apart.

Clearly, this would be a very interesting case from the point of view of translation. However, there are some reasons, beyond the normal worries about inductive conclusions, to have some reservations about Gil's analysis. von Fintel and Matthewson (2008) point out that an alternative explanation is that Maricopa has an unvoiced, or phonologically null, conjunction operator. Gil considered this, and argued against this possibility on the grounds that in sentences such as (3.58) *John* and *Bill* do not form syntactic constituents in the logical form which he proposes for the Maricopa sentence. However, no constituency tests are given to back this assertion, making it a highly uncertain claim. This leaves the strong possibility that what appears at the surface level to be bare concatenation actually contains an unpronounced conjunction operator, which would make (3.58) a fairly literal translation in both directions. On the other hand, a disjunction reading is forced for (3.59), so that it might be argued that this is, literally, a disjunction, whatever *-saa* means in other contexts. Unfortunately, Gil did not discuss any other disjunctive cases, leaving it unclear if other means are available for translating disjunctions. It would clearly be desirable to have access to a more in-depth discussion to know exactly what conclusions should be drawn about Maricopa and its underlying logic.

A similar case is that of Guugu Yimidhirr, which has been analyzed as lacking any vocabulary for making conditional statements. This claim has been presented as evidence by Evans and Levinson (2009) who are skeptical of any sort of linguistic universals, even at so basic

a level as being able to express the connectives of classical propositional logic. However, the basic facts here are open to dispute. In the most authoritative, to-date, survey of Guugu Yimidhirr we find the following passage (Haviland 1979:145):

(3.60) Nyulu nhanu dhawuunh wuna-nda buurraay wudhi-nda
3sgtNom 2sg+GEN friend be-CONTRF water+ABS give-CONTRF
If he were your friend, he would give you water.

Haviland notes that the suffix *-nda* is used here to signal a subjunctive conditional statement and that this clitic is "…also used to evoke a hypothetical, but as yet unrealized situation" (1979:145). This certainly seems as if *-nda* is performing much the same work as the "if" in the antecedent of a conditional. The following is another example from Haviland, drawn from a patriotic speech (1979:145):

(3.61) Ngayu yurraan dhaabangadhi-nda 'Yurrangan nanggurr wanhdhaa?'
1sg-NOM 2pl+ACC ask-CONTRF 2pl+GEN+ABS camp+ABS where

Yura wulbu-umu-n miirrii-nda 'ngadhu bubu yii?'.
2pl+NOM all-*mu*-ERG tell-CONTRF 1sg+GEN+ABS ground+ABS+here
If I were to ask you all 'Where is your camp?' you would all say 'my land is here…'

Notice that *-nda* occurs twice, in both the antecedent, on *dhaabangadhi*, or *ask*, and in the consequent, on *miirrii*, *tell*. The same pattern occured in (3.60), with the counterfactual marker occurring on both verbs in the sentence.

Haviland's (1979) work is the source cited by Evans and Levinson (2009), who use it as evidence that Guugu Yimidhirr has no conditional constructions equivalent to English. They

propose that an English language sentence such as "If the dog barks, the postman may run away" would need to be translated into the Australian language using a construction equivalent to "The dog might bark. The postman might run away". This analysis is based on examining sentences such as (3.60) and (3.61), which do not contain any sentential connective linking antecedent and consequent; instead, we have the counterfactual suffix on the main verb of both antecedent and consequent. Thus, the claim that "[I]n Guugu Yimidhirr there is no *overt* conditional" seems correct (Evans and Levinson 2009:135, italics added).

Beyond this, it is unclear exactly how much difference there is beneath the surface. Even restricting attention to English, conditionals are perhaps the single most vexing problem of semantics. On the surface, the English conditional has the logical form $\phi \rightarrow \psi$, while the nearest Guugu Yimidhirr equivalent is of the form $\Diamond \phi \,\&\, \Diamond \psi$, two constructions that carry very different truth conditions. But notice that Haviland himself provided both (3.60) and (3.61) with a conditional, "if…then" reading. There are two possibilities that might obtain here. It might be that logical form of the sentence and its translation are very different, Haviland's translation is merely an approximation, and we should guard against too liberal of an application of what Deal called the Exact Translation Hypothesis (§3.3). On the other hand, it may be that the logical form of these Guugu Yimidhirr sentences is $\phi \rightarrow \psi$, either because there is a covert conditional operator or because this is how *-ndaa* should be understood in this linguistic environment. Certainly, it would have been possible for Haviland to have glossed the sentences with a $\Diamond \phi \,\&\, \Diamond \psi$ form, as Evans and Levinson did, if he felt that better captured there meaning[131]. If the

[131] A third possibility is that there another way of expressing the conditional in Guugu Yimidhirr, along the lines of "Imagine that the dog barks. The Postman might THEN run away". Even if this is not the most natural way of putting things for a Guugu Yimidhirr speaker, this might be judged to be equivalent to the English subjunctive conditional, depending on the exact theory of conditionals one is operating with. This would also support the conclusion of von Fintel and Matthewson (next paragraph in the main text), and returns to the general point

conditional analysis is the correct one, it would follow the conclusion that von Fintel and Matthewson come to after a survey of such cases, including Maricopa, that the connectives of classical logic are semantic universals (2008:170):

> We conclude that while perhaps none of the logical connectives are universally lexically expressed, there is no evidence that languages differ in whether or not logical connectives are present in their logical forms.

§6. The (in)Famous Case of Pirahã

Finally, this chapter will close with a discussion of a topic no contemporary discussion of translatability would be complete without: the Pirahã language of Brazil. Daniel Everett (2005) made sweeping claims about this language, including reporting it to be highly untranslatable into English, and vice-versa. The length to which these claims are treated here has less to do with their merit than with the prominent attention that Everett's controversial work has received over the last two decades. In fact, a reader who is not independently interested in the controversy concerning Everett may wish to skim over this section.

§6.1 The "incommensurable" Pirahã Language

Everett's most widely discussed assertion has been, of course, that Pirahã lacks recursion, which Chomsky proposed to be the defining feature of human language[132] (Everett 2005,2007,2007a,2009; Hauser et al. 2002; Berwick and Chomsky 2016). Less widely noticed has been the claim that English and Pirahã are untranslatable, or "incommensurable" as Everett

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that for any particular counterexample that is proposed to translatability, it is often difficult to establish that *no* construction is available in the TL that captures the meaning in question.

[132] As the reader is surely aware this stemmed a fair amount of literature, mostly critical; this claim is best left to the syntacticians to evaluate and will only be very briefly discussed in this chapter. But it is worth noting that Everett appears to have backed off of this claim somewhat; in Futrell et al. 2016, of which he was one of the coauthors, it is stated, on the basis of the largest yet corpus study of the language, that a flat, recursion-less structure is one possible analysis, but not the only one that would fit the data.

phrases things (2005:264 fn). This is a claim to which Everett evidently assigns some importance, and he repeated it many times. For instance, Pirahã is said to be "incommensurate" in a "semantic or cognitive sense" with any language that has number words or counting, a concept said to be inexpressible in Pirahã because a number system requires recursion (2005:633). Arguments against Everett's interpretations of the evidence are dismissed as examples of the "…Universal Translation Fallacy, that is, that all languages translate fairly well into one another" (2007:7; note the similarity to Deal's discussion of the Exact Translation Hypothesis in fieldwork). It is notable that Everett makes many broad claims that are only supported by relatively minimal argument; at no point in his work is there the kind of careful, point by point, analysis that is found in Bitter, Deal, or Matthewson.

Everett presented Pirahã as a counterexample to Chomsky's program and its theory of a Universal Grammar, and although the main basis for this was the purported lack of recursion in the language, untranslatability was also cited (2007:28). The idea that translatability is crucial test of Universal Grammar was, of course, prominently held by Katz (as discussed in Chapter II, §3, this is a somewhat dubious view), but is also linked by many authors in the debate over language universals. This is true of many of those who see language universals as key aspects of human languages (e.g., Baker 2001; Wierzebacka and Goddard 2014; Li and Gleitman 2002), those who deny that there are any such universals (Levinson 2003; Leavitt 2011) and those who have a middle view on the topic (von Fintel and Matthewson 2008).

In his most widely discussed paper, Everett (2005) provided an extensive lists of ways in which Pirahã was allegedly unique among NLs. It is phonologically distinct, with the smallest set of distinct phonemes (for female speakers only, male speakers used one more to tie with Rotokas and Hawaiian). It is semantically distinct, in that it has the simplest inventory of pronouns; it has

no color terms, quantifiers or numbers. Finally, it is distinct at the level of syntax, in that there is no embedding of one phrase inside of another. Although the debate over the last claim- later extended to no recursion of any sort[133] (Everett 2007a)- has received most of the press, all of these claims have been challenged (though, to be fair, the counterarguments have varied in their cogency).

Everett declared that Pirahã is semantically *incommensurable* with English, a term which he took from Gordon (2004), a psychologist who had performed research on the numerical cognition of Pirahã speakers. As such, it was held to be untranslatable relative to English in a more profound way than the other cases discussed in this chapter are alleged to be. Not only is it proposed to be a counterexample to ***T'***, in that the meaning of many Pirahã sentences cannot be conveyed using English and vice-versa, but the best possible translations are often "poor approximations" that in some cases are unintelligible without extensive explanation (Everett 2005:624fn). This runs against the somewhat loose position expressed at various time by Deal, Matthewson and Keenan that even though translatability fails at the level of formal semantics, a speaker will always be able to use their language to more or less get the point across. As Deal put it, "speakers rephrase, they paraphrase, they make do" (Deal 2011:576, see also the Keenan's *Weak Effability Hypothesis*, Chapter II §4); Everett effectively denied that Pirahã speakers can do this in many cases.

[133] Syntactic *embedding* and *recursion* have, or at least initially had, different meanings in the context of this debate. In their initial response to Everett (2005), Nevins et al. (2009) pointed out that what Everett calls *embedding* seems to be describing only *self-embedding*, that is, the inclusion of a phrase inside a phrase of the same type, e.g., a noun phrase inside of a noun phase. In response, Everett made it clear that he meant any sort of *recursion*, which he defined as the application of any rule contained in a given set of rules to the output of any rule of that same set (Everett 2007a,2009). This broader definition of recursion would obviously include placing a phrase inside of any other phrase, so the claim that Everett intends is that Pirahã has a flat structure, with no nesting of phrases.

Before discussing specific examples of the how Pirahã is allegedly untranslatable, a few general points about Everett's analysis are worth noting. First, Pirahã is supposed to be a relatively simple, i.e., primitive, language, which lacks the means to express many propositions that are basic to other languages. We have so far examined other cases where one language lacks some specific vocabulary or expressive mechanism as compared to another (usually English), e.g., deontic necessity in Nez Perce, definite determiners in Salish languages, tense in Kalaallisut, or the verbal suffixes which indicate that pronouns do not co-refer that are found in Hopi but not English. Everett's analysis would make Pirahã a standout among these cases in the sheer variety and quantity of constructions and vocabulary, both open and closed class, which are said to be lacking. It would also be remarkable in the central role played, in most languages, by some of the functional items said to be missing, for instance, quantifiers (the presence of which is generally taken to be a linguistic universal, e.g., Wierzbicka 1996; von Fintel and Matthewson 2008).

Numerous critics have pointed out that such widespread and pervasive gaps in the expressive power of the language would force one of two equally counterintuitive and unappealing conclusions, a dilemma which Everett avoids addressing in full. One conclusion is that, since concepts such as the basic notion of *everything in a set*, captured in English by the quantifier *all*, are fundamental to human thinking, the Pirahã must be very limited in their ability to communicate their own thoughts, as a consequence of the primitive nature of their language. One commenter, who overall was sympathetic to Everett, cautioned that he should scale back or better explain some of his claims, as a reader may be left with the impression that "…the Pirahã do not have developed communication because their language does not permit it" (Surrallès in Everett 2005:239). The other possibility would be that the Pirahã seem to communicate in a very

limited range because their thoughts are likewise very limited. McWhorter, with characteristic bluntness, accused Everett of "…coming perilously close to calling the Pirahã idiots", and noted that he had been banned by the Brazilian government from further research because of the racially charged implications of his accounts of the primitive indigenous mentality (McWhorter 2016).

Is it also significant that the direction of translatability with English is held to be bidirectional, in which it is unlike most of the cases discussed in this dissertation. This is not at all what we would expect, given that all of the alleged gaps are in Pirahã, and not the other way around. As a matter of *a priori* reasoning, if a language $\mathcal{L}_1$ lacks some vocabulary or construction that are found in $\mathcal{L}_2$ (and the means to paraphrase away those gaps), then what is expressible in $\mathcal{L}_1$is a proper subset of the propositions expressible by $\mathcal{L}_2$; in other words, anything that can be said in $\mathcal{L}_1$can be said in $\mathcal{L}_2$ but not the other way around (at least as far as regards the vocabulary in question, things may well be the other way around as concerns some other topic). Although there are some exceptions at the level of preserving presuppositions, this is indeed the pattern that we have observed for more basic failures, e.g., there are English sentences with no truth conditionally equivalent sentence in Nez Perce (because of modal vocabulary) or Kalaallisut (because of tense), but we do not find the converse[134]. In contrast, Everett presents the untranslatability between English and Pirahã as bidirectional, a result of the incommensurability of the two languages, and he reminds his readers at several points that the

[134] Naturally, most of the published counterexamples to translatability involve English as the SL, that is, English is the language that contains the untranslatable sentences. This is to be expected because most of the literature is in English. It is very reasonable hypothesis English as the TL may have undetected gaps relative to Nez Perce, St'at'imcets or Kalaallisut that are as of yet undetected. For instance, Kalaallisut is said by reputable sources to have a much more extensive vocabulary for snow and ice than English (Kaplan 2003, see Chapter 1, fn 1). Still, the point remains that *relative to a certain type of grammatical device* (e.g., modals for deontic necessity) the untranslatability is unidirectional in all of these cases. That is, we do not find that sentences of deontic necessity are untranslatable both from English into Nez Perce and also from Nez Perce into English.

translations he gives for Pirahã sentences are loose approximations. However, there is no explanation of why this untranslatability should exist in both directions, given that it is supposed to stem from a unidirectional gap in expressive power.

In fact, there has been some criticism of the translations that Everett does provide, which are typically unintelligible, e.g., "My bigness ate at a bigness of fish, nevertheless, there was a smallness we did not eat" is given as a back-translation of "We ate most of the fish" (Everett 2005:624). It has been noted these sorts of translations are quite unlike those found in the work of other field linguists (Nevins et al. 2009, a comparison can be made to the excerpts in this chapter drawn from other researchers). In Everett's own work prior to 2005, Pirahã was, to be sure, a language very different from familiar Indo-European specimens, but there was no mention of dramatic gaps, incommensurability, or counterexamples to universal grammar. The translations of Pirahã sentences were also much more comprehensible. Nevins et al. make the following observation about Everett's earlier and later work (2009:361):

> [Everett 1979] and [Everett 1986] present Pirahã examples in a standard manner, with dashes and spaces separating morphemes judged to be independent, and with glosses and translations offering a fair approximation of the meaning as rendered into Portuguese [1979] and English [1986]. In most cases, one can easily discern the contribution of the individual morphemes to the meaning of the whole. Similar data when presented in [2005], however, have a rather different character. Morpheme division is more extreme and less semantically transparent. Thus, for example, [2005] offers the gloss 'cloth arm' where [1986] has 'hammock', and represents the Pirahã rendering of 'all' with the gloss 'big'.

This observation naturally leads to questions concerning the accuracy of Everett's translations, and whether he is deliberately presenting the sentences in as alien a fashion as possible, very differently than how they would be understood by a native speaker[135]. Wierzbicka, in response to Everett's claim that Pirahã has no quantifiers, alleges that he is deliberately "exoticizing" Pirahã by translating morphemes based on their etymology rather than their current meaning. She explains that Everett glossing *'ogi* as *big* (prior to 2005 he had always glossed this morpheme as *all*) is analogous to glossing the English "understands" as "stands under" (Wierzbicka in Everett 2005:641). Wierzbicka also notes that Everett ignores the possibility of polysemy, for instance that *'ogi* could mean *big* in some contexts and *all* or *most* in others (*'ogi*, and quantifiers in general, will be discuss in more detail below in §6.4).

It is an important methodological point that whenever a linguist must render data from one language into another, they are faced with a dilemma. On the one hand, it would be misleading to provide the translation of foreign sentences in an exotic fashion that distorts the way that they would be understood by a native speaker. For example, "I ate of the apples of the earth" is clearly a very poor translation of "J'ai mangè des pommes de terre"; much more representative of the way the sentence is understood by a Francophone is "I ate potatoes". But on the other hand, there is a danger of erasing real semantic differences by seeking to provide translations that are easily understood, or just "sound natural", in English. It may not always be clear what the best path between these two extremes is; see, for example, the discussion of (3.61) in the previous section, where Evans and Levinson are asserting that Haviland had obscured

[135] In a better known case, Pinker accuses Whorf of the same fault, when he ridicules his back-translation from Apache of "It is a dripping spring" as "As water, or springs, whiteness moves downward" (Pinker 1994:49). Pinker states "Whorf rendered the sentences as clumsy, word-for-word translations, designed to make the literal meanings seem as odd as possible…I could, with equal grammatical justification, render the first sentence as 'Clear stuff-water-is falling'. Turning the tables, I could take…. 'He walks' and render it 'As solitary masculinity, leggedness proceeds.'" (1994:50). I should add that, while this is an excellent illustration of the issue here, I am not in general sympathetic with Pinker's shockingly uninformed and *ad hominem* treatment of Whorf.

important facts about the sentence in his translation (based on Haviland's own gloss). For a reader not fluent in both SL and TL it may often be impossible to know if the linguist presenting the data has struck an acceptable balance. However, it is also worth reiterating again that many of Everett's translations from Pirahã into English are quite unlike those provided by other linguists for the languages that they have studied. This can be seen as lending some weight to the criticisms of Nevins et al. and Wierzbicka.

§6.2 Recursion

As mentioned previously, the claim that has been by far the most discussed is the assertion that Pirahã lacks recursion. Without recursive embedding, phrases are merely juxtaposed together without structure (Everett 2005,2007a). The major reason that this assertion has caused so much heated debate is that recursion has always played a central role in the generative program, with Chomsky more recently calling it the only specially human aspect of the language facility and a universal property of all NLs (Hauser et al. 2002; Berwick and Chomsky 2016). Even outside of the strictly Chomskyan tradition, recursion is very widely regarded as a universal of human language (von Fintel and Matthewson 2008).

Everett's analysis has come under withering criticism. Nevins et al. (2009,2009a) show that most of Everett's data is better analyzed by giving the Pirahã sentences recursive structure, and point out that this was in fact Everett's own interpretation prior to 2005 (Everett 1979,1986). von Fintel and Matthewson (2008) point out that if Pirahã really does have a flat phrase structure, with phrases merely juxtaposed together, yet somehow still generates an infinity of strings (as claimed in Everett 2007a), it is not clear how the language can possibly be learned, or how meanings could possibly be assigned to strings.

For our purposes, it is not necessary to enter into these debates[136], but we can note that, even if Everett is correct, the consequences of a flat phrase structure for translatability are not as profound as they may at first appear. Everett himself notes that "Pirahã most certainly has the communicative resources to express clauses that in other languages are embedded" (2005:631), so the alleged incommensurability is not held to be a direct result of the lack of recursion.

On Everett's analysis, phrases that would be embedded in English are, in Pirahã, merely attached by parataxis to what would be the embedding sentence. Although the claim that Pirahã has this sort of structure is controversial, it is difficult to imagine a non-recursive language working any other way. What this indicates is that translation issues at the level of preserving presuppositions would be very common. For instance, because Pirahã would not be able to form relative clauses at all, there would be frequent cases along the lines of sentence (2.7) (see Chapter II, §6.3). Recall that in that case, the Hebrew sentence (2.7) contained a relative clause that could not be formed in English, and thus required translation into English as a conjunction

[136] Although I will mention in passing that I am sympathetic to the critics and, and that as discussed in fn 49 Everett himself seems to have recently struck a more conciliatory tone on the issue. But if Everett is correct, and Pirahã lacks a recursive structure, the exact implications for Chomsky's theory of Universal Grammar is unclear. On the one hand, it is certain that a single language (or even many languages) without recursion would *not* represent a knock-down blow to UG. As a first point, UG is theory of an underlying biological capability, and by Everett's own account the Pirahã do not use recursion because of a cultural bias against talking about events outside of immediate experience, not because they cannot do so (Everett 2005). This fits with Chomsky's own assessment of the case; although he does not believe Everett's evidence he adds that even if it was correct it would indicate only that "The speakers of that language aren't making use of a capacity they surely have…plenty of people throughout history would drown if they fell into water" (Chomsky, quoted in Knight 2008:21). The possibility that there may be some biological basis for the particularities of the Pirahã language seems to be conclusively ruled out by the fact that Pirahã children raised by Brazilians acquire normal Portuguese.
On the other hand, it would be wrong for advocates of UG to dismiss the case as without interest, because it would undermine the cogency of the argument that UG is required to explain the acquisition of language. Even if Pirahã is shown to be simpler in terms of syntax and vocabulary than other human languages, it would remain a *language* with a stable grammar, albeit a grammar different than that of other languages. It is not a pidgin, let alone something analogous to an improvised system of communication used by "feral" people. The acquisition, by a human population, of a language that does not fit the principles of universal grammar would demonstrate that possession of UG is not a necessary condition for language learning. This would not by itself be evidence that UG does not underly every other language spoken by humans, but it would have implications for the argument that UG is needed to explain how language learning is possible.

of two separate clauses, one of which asserted information that had been merely presupposed in the SL sentence. We would expect such there to be numerous problems along these lines when translating from English into Pirahã, because the only way to translate any sentence with an embedded clause is similar to the strategy just described: express both the embedded and matrix clause as separate sentences and attach them together (by parataxis, as Pirahã is said to lack conjunctions). This leaves a wide scope for situations where presuppositions would have to be asserted, as in the example of (2.7). For instance, "There is the man who stole your wallet" would have to be translated as something more literally equivalent to "There is a man. He stole your wallet." So, in our terminology, a language without recursion would have untranslatable relative to other human languages in that it would have counterexamples, at the level of E_3, to $\boldsymbol{T}$, but the flat structure would present no problem at all for $\boldsymbol{T'}$. It is unclear what, if any, consequences there would be in the inverse direction, from Pirahã to English, and at this stage in the discussion, none of this is very exciting news as we have seen several much less controversial examples where presupposition structures cannot be preserved.

§6.3 Logical Connectives

Pirahã, like Maricopa, is also alleged to lack any sentential connectives corresponding to the conjunction, disjunction, or conditional of classical logic, at least overtly. Of course, would be entailed by (but not entail) the lack of any kind of phrase structure in the language. Conjunction is implied by parataxis, as in the following, which is the Pirahã equivalent of "Ko'oi and Kohoi came" (Everett 2007:5):

(3.62) Kò'oi'(hi) hoaga'itaha'. Kohoi(hi pi'o) hoaga'itaha'.
name (he) came name (he) (additionally/too) came
Ko'oi came. Kohoi came (too).

Interlocutors generally know, in the absence other indicators, that when a series of phrases are asserted, it is to be interpreted as a conjunction. Everett does not consider the possibility of a phonologically null conjunction operator, presumably because this would not fit with the analysis of Pirahã as lacking any hierarchal phrase structure.

Disjunction is marked by a lexical item which Everett glosses as expressing uncertainty, as in the following, which is the Pirahã equivalent of "Kohoi came or Xabagi came" (Everett 2009:22)[137]:

(3.63) Kohoi kahápii. Xabagi kahápii. Xmh. Kosaagá.

Kohoi came. Xabagi came. Hmm. (I) don't know

A rising tone from one sentence to the next indicates that the two are antecedent and consequent. For instance, the following would be understood as a conjunction unless a rising tone identified it as a conditional (Everett 2009:10):

(3.64) Pii -boi -baaí -hai. Ti kahápi -hiaba.

water -move:downwards -intensive -intentive 1 go away -negative

'It is raining a lot. I will not go.'

Thus, whatever the facts of the matter about recursion in Pirahã, we see that conjunction, disjunction and conditionals can be translated into that language. There remains a question about whether the translations would be truly semantically equivalent. This would depend on whether the Pirahã sentences are expressing the connectives through semantic means or through some sort of pragmatic implication. Certain considerations make the semantic explanation more likely. There may be no overt conjunction operator in Pirahã, but conjunctions are so basic to human

[137] The reader may have noticed that in (3.62), *came* is *hoaga'itaha*', while in (3.63) it is *kahápii*. I have no explanation for this and can only speculate that the two Pirahã words are roughly synonymous.

thinking that it is difficult to imagine that a Pirahã speaker would need to engage their global mental facilities in order to perform abductive, pragmatic inference, using resources from outside the language faculty, in order to understand every conjunction they are presented with in their own language. Likewise, with disjunction; if *Kosaagá* indicates a disjunction whenever it is used- and Everett notes that is the most common method of indicating disjunction- then it should more felicitously glossed as a disjunction in those contexts, whatever the etymology of the word or its other uses[138]. Pirahã is also a highly tonal language, with a phonologically identical morpheme spoken in different tones counting as utterances of different lexical items. This would seem to indicate that the rising tone for conditionals is a semantic effect, and not analogous to, say, an English speaker's use of a certain tone to indicate sarcasm. So, it seems very probably that the observation of von Fintel and Matthewson (2008) cited at the end of the last section remains intact: whether or not all languages contain overt sentential connectives corresponding to those of classical logic, they all have the means to express them without falling back on pragmatic implication.

§6.4 Quantifiers

Of perhaps more direct consequence to translatability is the claim that Pirahã has no quantifiers: 'The are no quantifier terms like "all", "each", "most", and "few" in Pirahã" (Everett 2004:624). Everett does not include an existential quantifier in this list, and several of his own translations seem to indicate the presence of an implicit existential quantifier, so the claim should perhaps be understood as no quantifiers except for an implicit existential (e.g., *gàta -hai hói*, literally "Smallness of cans", less literally "[a] few cans", 2005:624). This claim has proved

[138] Alternatively, a sentence like (3.63) just *is a* disjunction according to some analyses, e.g., Zimmermann (2000:255) asserts that "disjunctions are conjunctive lists of epistemic possibilities", a description which matches perfectly with Everett's examples.

controversial, as *all* is commonly held to be a lexical universal, and although few languages have a lexical item equivalent to *most*, all known languages have a standard construction for expressing this meaning (see discussion in §5.3). In Everett's own previous work, he had listed a number of quantifiers, including terms corresponding to *all*, *a little*, *none*, *many* and *much* (Everett 1986), claims which he rescinded in 2005.

In later work, Everett does discuss a number of sentences which contain what he calls "…the closest expressions that Pirahã can muster to the quantifiers" (2005:624). For instance, we have the following much discussed sentence, notice the use of *'ogi* (Everett 2005:624):

(3.65) ti 'ogi –àaga -ò 'ìtii'isi 'ogi -ò 'i kohoai-baaì

I big -be(permanence) -direction fish big direction she eat-intensive

Koga hòi hi hi -i kohoi -hiaba

nevertheless small amount intensive intensive be eat -not

"We ate most of the fish."

Literal translation: "My bigness at a bigness of fish, nevertheless, there was a smallness we did not eat."

In the following, '*ogi* is used in what seems to be a universal quantifier role (the English translation is Everett's but is intended as an approximation):

(3.66) hiatìtihì hi 'ogi -'àaga -ó pi -ò kaobìi

Pirihà people he big -be(permanence) -direction water -direction entered

All the people went to swim/went swimming/are swimming/bathing, etc.

It certainly appears that *'ogi* is being used as a universal quantifier in these sentences, as has been pointed out several times by critics; this would make (3.65) more equivalent to "We ate all of the fish except a small amount" than to the bizarre translation provided (Nevins et al. 2009; von Fintel and Matthewson 2008; Wierzbicka commenting in Everett 2005). As mentioned earlier, it has been suggested that *'ogi* is actually a universal quantifier, given that it used regularly in this role, which is either polysemous, also used to mean *big*, or with an etymology tracing back to a word with that meaning. Everett himself had always translated *'ogi* as *all* prior to 2005. It seems plausible that if *'ogi* is routinely used as the quantifier *all*, that is what it means, or at least one of its meanings. To give a familiar analogy, the French negation operator *pas* comes from the word for *step* originally (in the 16th century), but even though *pas* is also still used to mean *step* the two meanings are kept completely separate by modern speakers (and translators).

Part of the reason Everett gives that these words are not quantifiers is that their truth conditions are different from those of English quantifiers. For instance, he recounts that interlocuters would assent to the use of the word *'oqi* when there are obvious exceptions, for instance they would agree to the use of (3.66) in the presence of someone who had not gone swimming (Everett 2009). Similarly, he recounts how he had changed his mind about the suffix -*ba'aiso*, which he had previously translated as *whole* (in the sense of *the whole thing*): he observed a hunter who used that term to describe the hide of a python he had sold to a Brazilian, even though he had obviously removed a piece of the skin prior to the sale (Everett 2005,2009). A referee for his 2005 paper suggested that these are quantifiers, but ones that do not necessarily correspond perfectly to English equivalents. Everett rejected this argument on the grounds that

having different truth conditions from the English quantifiers indicates that these words mean something entirely different (Everett 2005:624 fn).

Everett's reasoning here seems gravely faulty on at least two points. First of all, it is sentences that have truth conditions, not individual words; it makes no sense to speak of, for example, *all*, as having truth conditions independent of its use in a sentence. It is far from clear, on the evidence that Everett provides, that the truth conditions of sentences containing *'ogi* or *-ba'aiso* are significantly different from those of English sentences containing *all* or *whole* (Nevins et al. 2009). English speakers very seldom use *all* in normal discourse to mean *absolutely all, without exception* (e.g., "all the men in the world went swimming), instead it is nearly always implicitly restricted to some subset or domain. Besides this, ordinary use of universal quantifiers typically admits of some exception, e.g., "Don't go there, everyone in town is sick" would not be understood, in most circumstances, as the claim that literally every single person in town was ill. Although perhaps an argument can be made that *'ogi* and *-ba'aiso* are not perfect translations of any English quantifier words, it is also just as likely that the slightly different conditions observed for use are pragmatically based, having to do with what sort of exceptions a speaker will allow to a universally quantified claim, and that the words are semantically equivalent to their counterparts in other languages (or, this might be taken as evidence that, once again, semantics and pragmatics are running together). But, even if Everett is correct that the meaning of *'ogi* is importantly different from that of *all*, this is very far from establishing that it is not a quantifier word. If one encountered a language that had a simple lexical item that meant, say, *all but one*, this would be instantly recognizable as a quantifier word despite the fact that there is no simple English equivalent.

In fact, given Everett's own discussion of *'ogi*, which indicates that it is used under the same conditions as *all* but also when there are a few obvious exceptions, it seems that it has an English equivalent: *most*. If *'ogi* means *most*, but there is no stronger quantifier meaning *all*, this exactly what we would expect, that *'ogi* would be used in situations appropriate for both *most* and *all* (see Deal's discussion of the hypothetical language $\exists nglish,$ §2.3).

Even though Pirahã may not have a word for universal quantification, it does have a generic construction, as shown by data like the following (Everett 2005:5):

(3.67) kaoàibogi hi sabì 'àagahà
evil spirit he mean is
Evil spirits are mean

Everett argues that the generic construction cannot be understood as containing an implicit universal quantifier. In Pirahã, he reports, generic sentences are always understood to have an implicit restriction to cases of which the speaker has knowledge, for example, in the case above the speaker means "evil spirits that I know of". This is not an entirely convincing argument. In languages such as English, generics are used across a range of meanings, from implicit universal statement (e.g., "cats are mammals") to statements about a large majority ("philosophers are impractical people") to sentences whose truth conditions are not entirely clear ("mosquitos carry malaria"). In cases where a universal quantifier is meant, there is almost always an implicit restriction to a certain domain, for example, "beavers build dams" does not include beavers in zoos, beaver kits, and so forth. One might also argue
that, if the Pirahã intend generics to always be used with exceptions due to cultural constraints against making universal claims, then this is a cultural feature of speaker behavior rather than a

semantic property of the words themselves. But, as has been pointed out several times already, these two aspects of language may be hopelessly entangled.

The total weight of these considerations seem to indicate that the Pirahã have the semantic and lexical means to express quantification, although the vocabulary may not line up exactly with English. This seems to support the idea that we should extend von Fitnel and Matthewson's observation concerning the connectives of propositional logic to quantifiers: languages may differ in what logical operators are overt, but not in their ability to express core logical concepts.

§6.5 Colors and Numbers

Turning to the absence of color vocabulary, it is not clear that there is actually a problem for translatability in this case. There are terms available to provide color descriptions when needed, for instance, *bi^{3}i^{1} s*" for "red" and *a^{3}hoa^{3}s aa^{3}ga^{1},* "temporarily immature" (in the sense of unripe) for "green"[139] (Everett 2005: 627). In this respect, Pirahã is like other recorded cases of languages without color vocabulary, such as Warlpiri (Hale 1975). In fact, it has been argued that because these phrases are used in a consistent and standardized fashion, they just are, in fact, color vocabulary (Nevins et al. 2009). Everett rejects this proposal on the grounds that these phrases are not, on his analysis, morphologically simple (Everett 2009). The reasoning here is not clear, since, for example, *aquamarine* and *burnt sienna* are both clearly color words.

A more interesting consideration for translatability is that the Pirahã do not use these phrases in a quantificational sense, as in *red things* or *red plants.* However, Everett (2005,2007)

[139] The data under discussion by Everett here is drawn from undated work by Sheldon and Kay. The phrases given here are both presented as morphologically simple (i.e., as single words) in the original work. The numbers in the exponent positions indicate tone; Sheldon and Kay analyzed the Pirahã tonal system as making a three-way distinction, unlike Everett, who transcribed it making only a two-way distinction.

himself attributes this to a cultural bias against making general statements. The Pirahã will never speak about *things* or *plants* in general as opposed to some immediate set of them, nor will they identify specific subsets of general types such as *red plants*. But this seems to be a cultural restriction, and so does not seem to reflect a restriction on what can be done with the language so much as a normative stance about making universal claims, similar to that discussed in the previous subsection.

Pirahã is also claimed to lack number vocabulary at all (Everett 2005,2007), a very rare but not unique situation (Hale 1975; Hammarström 2010). It is uncontroversial that any number vocabulary that Pirahã might have is extremely limited, but other sources, including Everett's own earlier work, gloss the word *hòi* as *one*, and *hoì as two* (Everett 1986). This would leave it open that Pirahã would have the capacity, in principle at least, to describe larger numbers precisely, along the lines of Warlpiri, which has no number vocabulary at all but whose speakers use the terms for singular and dual to indicate numbers (Hale 1975, discussed in Chapter II, §6.1).

In Everett's post-2005 work, *hòi* and *hoì* are instead taken to have some sort of indeterminate meaning, roughly indicating lesser or greater quantities. This conclusion has been questioned (Nevins et al. 2009), but it possibly receives some support from controlled experiments (Frank et al. 2008). In these trials, all Pirahã subjects were observed to count an increasing number of objects as *hòi* for one, *hoì* for two and either *hoì* or *baágiso* (*many*) for larger amounts, which is more or less what would be predicted if *hòi* and *hoì* are number terms. However, when presented with 10 objects whose number was then decreased one by one, speakers showed much more variable terminology, with some using *hòi* for as many as six objects, and with all subjects using *hòi* when presented with two or three objects (Frank et al.

2008:2). Although Everett presents this as conclusive proof that *hòi* and *hoì* are not number words meaning *one* and *two*, it is actually difficult to know exactly what conclusion to draw from these experiments. None of the authors of the study, including Everett, hazard a hypothesis as to why the words were used differently in the two tasks.

Again, it seems that the possibility of polysemy is being discounted here. It is possible that Pirahã has lexical items that can be used for the numbers one and two, but have other uses as well, and for whatever reason these meanings are preferred in the case of referring to decreasing amounts. Supporting this analysis are phrases such as the following (Everett 2009:20, drawn from Everett 1986)

(2.61) Kabogàohoì biìsai xogiì hoìhio

barrel red big two

two big red barrels

Although *hoìhio* was glossed as *two* in the (1986) original, this is later changed (2009) to *slightly larger amount*. It is not clear that this amendment makes any sense- larger than what? If the answer is *larger than one*, then this word must mean *two* in at least some contexts.

If Everett's analysis is correct, then there is a major translation gap going from any other known language into Pirahã. As noted, other numberless languages have mechanisms for counting based on the grammatical plural/singular distinction, but Pirahã does not mark this distinction (Everett 2005)[140], making these methods unavailable. Even the concept of using

[140] Sheldon (1988) finds the opposite, and shows the Pirahã as making the plural/singular distinction on all pronouns. In Everett's own pre-2005 work, plural is indicated by the use of a word glossed as *also*, e.g., *ti xaı´tiso, first-person also* or, less literally, *we* (Everett 1986:281). Sheldon renders this as a single word, *tixaı´tiso,* glossed as *1st person plural*, with similar forms for second and third person (Sheldon 1988:146). Nevin et al. (2009) suggest that this might be another case of Everett deliberately "exoticizing" his gloss by splitting morphemes along lines suggested by etymology.

fingers to indicate number is also reportedly not understood (Gordon 2004; Everett 2005). Of course, even if Everett is wrong, translating phrases containing number terms greater than two in Pirahã will involve a significant amount of highly unnatural paraphrase in the TL[141].

In concluding this section, Everett has made many bold claims concerning the translatability of Pirahã. These claims have been widely challenged, both regarding his interpretation of the data and on theoretical grounds. Some of these challenges have been described above, and it is worth noting that some severe methodological criticisms have originated from parties who can in no way be described as partisans of Chomskyan linguistics (e.g., Levinson in Everett 2005)[142]. However, in fairness to Everett it should be noted that his firsthand knowledge of Pirahã vastly exceeds that of any other non-native; in fact, his most vocal critics have had to base their interpretations almost entirely on his own pre-2005 work. It comes across clearly that Pirahã is typologically very different from more familiar examples, whether or not the term "incommensurable" is really justified. Some of the claims discussed in this section may yet turn out to be correct when the dust has settled, including some of those regarding translatability.

[141] Everett attributes the lack of numbers in Pirahã to the absence of recursion, which is also said to prevent the Pirahã from learning to count in other languages. This is not a cogent argument, as syntactical embedding is not the same thing as the mathematical successor operation. Although the same part of the mind may be responsible for both operations (Hauser et al. 2002), there is absolutely no reason why this faculty cannot be exercised in one respect and not in another. Because Everett maintains (2005) that the Pirahã are not psychologically or cognitively abnormal, and the barrier to using recursion linguistically is a cultural constraint on speaking of different topics in the same utterance, there seems to be no reason why counting using the successor operation would be barred. In fact, it has been reported that in the last several years, government schools are operating in the Pirahã area and teaching mathematics in Portuguese (Neil 2019), suggesting that soon the language may soon be extended with a full counting system in the manner of Warlpiri (Hale 1975, see Chapter II §6.2).

[142] Levinson, co-author of "The Myth of Language Universals" (Evans and Levinson 2009) and trenchant critic of Chomsky, provided a review of Everett's work can be summarized by the exert "…nor does the argumentation remotely approach the standard of the classic anthropology on cultural coherence….let alone those set in modern linguistic discussions" (2005:637).

What is more questionable is whether these claims support the sort of consequences for the program of generative linguistics, or the search for linguistic universals more broadly, which Everett claims for them. This is true of the alleged absence of recursion, but also of the alleged untranslatability with other languages. There is no reason why the Pirahã language cannot be supplemented with new vocabulary, even, if necessary, having its grammar reorganized to allow recursive constructions, in order to say anything that can be said in any other language. After all, Pirahã speakers apparently have the

same cognitive resources and language learning abilities as the speakers of any other language, and so nothing prevents them from extending their language if they so desired. Again, this is not a trivial point; artificial languages exhibit no such feature, nor do systems of animal communication. This points to a deep unity underlying all natural human languages.

§7 Summary and Conclusions

Chapter II examined one way of setting the terms of the translatability debate, given by Katz and his definition of the Principle of Translatability, ***T*** (1978). We saw that there was some disagreement here. Keenan (1978) saw Katz's definition as too liberal in some respects, since it discounted the obvious fact that languages have very often have vocabularies that express concepts with no exact counterpart in some other languages. Despite this, Keenan was willing to engage with Katz on his own terms and worked to define counterexamples to ***T***, given Katz's own definition. This thread was continued in the work of Matthewson (2006; von Fintel and Matthewson 2008) discussed in the current chapter. At the same, although no other proponent of universal translatability proposed a rival definition, it is implicit in the work of most of them (e.g., Jakobson 1959) that they were thinking in terms of looser criteria than Katz, especially in that they were not especially concerned with presuppositions. This consideration led to the

definition of a less strict principle, ***T'***, that did not require of a successful translation that presuppositions be preserved as presuppositions.

Thus, we have two ways of defining the Principle of Translatability, and of course more could conceivably be suggested. Many proposed counterexamples to ***T*** would not count against ***T'***. However, there is the further question of what sort of means are available to a hypothetical translator to supplement the semantic resources of the TL, or, to frame things another way (as in Deal 2014) whether we are looking at a language at a certain moment in time or as an entity that evolves to suit the need of the speakers. Instead of trying to legislate the correct way of defining translatability, it is best to concede that

> Any agreement over what is or is not translatable, and exactly what criteria constitute translatability, will ... crucially depend on the different sectors of practice and research involved (Pym and Turk 2008:273).

As a step in this direction, a hierarchy of translatability was defined (Chapter II, §5), ranging from cases where every single SL sentence can be translated into the TL without augmenting the resources of the latter (E_0), to cases where new open class (E_1) or closed-class, functional (E_2) vocabulary is required, and finally the limiting case where the syntax of the TL requires adjustment (E_3). Although Keenan felt that true translatability obtained only in terms of E_0, Katz and Jakobson were explicit that at least level E_1 was acceptable, although they are ambivalent as to whether E_2 should be considered as allowable (see chapter II, §5). Discussing this hierarchy, and which level is of the most interest in discussing translatability, leads into the deep philosophical issue of how languages should be individuated for this purpose, an issue which I have evaded until this point but will take up in the next chapter. For now, we will merely note that different levels of translatability can be defined.

In the present chapter, we discussed a number of alleged counterexamples to translatability. We that several fairly credible cases in which two languages were at E_2 on the criteria of $\boldsymbol{T}$. In fact, it seems that the sorts of language features that give rise to translation issues involving presuppositions are widespread enough that, even if a Katzian can formulate an effective response to some particular counterexamples, we can rule out $\boldsymbol{T}$ as a viable hypothesis unless we wish to allow for the introduction of new functional vocabulary. As for $\boldsymbol{T'}$, we saw that there are at least two well-documented counterexamples (English-Nez Perce, English-Kalaallisut) at the level of E_2, and possibly another (English-Pirahã). Although more information is necessary, at least one case at E_3 has been proposed (English-Yaqui).

So, now that the empirical facts are on the table, we should now turn to the philosophical basis of our investigation. Most importantly, can we be any more precise about the entities, *languages* and *meanings*, that are the main subject matter of this research?

Proposed Counterexamples to Universal Translatability Discussed in This Chapter (in order of appearance)

Source Language	**Target Language**	**Counterexample to:**	**Level of Translatability between SL and TL**	**Issue:**	**Section**
English	Malagasy	***T***	E_3	Locative information in oblique noun phrases	§1.
Hopi	English	***T***	E_2	Overt morphological indicators that a pronoun does not refer to an antecedent noun	§1.2
Frisian	English	***T***	E_2	Presuppositions of determiners	§1.2,
English	French	***T***	E_2	Formal/Informal modes of address	§1.3
English	Salish languages	***T***	E_2	Definite determiners, it-clefts	§2.1,

English	St'at'imcets	***T* (?)**	?	Presuppositions	§2.2,
English	Nez Perce	T'	E_2	Modal vocabulary	§3
English	Yaqui	T'	E_3	Syntax of modal verbs and negation	§3.3
English	Kalaallisut	T'	E_2	Tense	§4.1
English	Hopi	***T* (?)**	E_2	Tense (?)	§4.2
English	Tzeltal/Guugu Yimidhirr	T'	E_1	Coordinate systems	§5.1
English	Maricopa	T'	E_2	Sentential connectives	§5.2
English	Pirahã	***T***	E_3	Recursion	§6.2
English	Pirahã	T'	E_1, E_2	Sentential connectives, Quantifiers, Color vocabulary Numbers,	§6.3-6.5

NOTE: The case of Hopi-English was chosen as representative of an issue that is much more widespread; the source material (Keenan 1978) discusses several other examples. Likewise, Frisian-English was chosen for discussion although Malagasy-English displays exactly the same issues.

Chapter IV: Defining the Question

"[W]hether- and to what extent- we can in particular cases achieve exact translation is an open question, which *must* not be closed by philosophical legislation."
(Bar-Onn 1993, italics in original)

0. Introduction

In this chapter, I will address a major issue that has been hanging over the discussion from the start, the identity criteria for languages. As promised in Chapter 0, it is now time to kick away the ladder that we have spent the preceding chapters climbing.

This dissertation began by asking the question of whether anything that can be said in one natural human language (NL) can be said in any other. It was immediately apparent that in order to resolve this question in a satisfactory way, we needed precise answers to difficult puzzles about the individuation of languages and the nature of meaning. It was stated that eventually we would try to resolve these problems, but rather than tackling them head on, we turned to the study of expressive power in *formal* languages (Chapter I), where these matters are less problematic. Formal logic provided some clear-cut examples of what it would look like for two languages to be equivalent, or to be non-equivalent, but we also found the situation to be messier than might have been expected, with rival accounts of translation and equivalence on offer. We

then moved on to examining the literature on natural language translatability (Chapter II). Particular attention was given to Katz and the Principle of Translatability, ***T***,[143] which set terms that were largely followed by subsequent authors. In the chapter previous to this one, we discussed a range of proposed counterexamples to ***T***, taken from studies of diverse languages. On the basis of this evidence, it seems that ***T*** is almost certainly untenable, and even the weaker ***T'*** is unlikely to obtain. However, it would be wrong to say that our question has been answered at this point: it would be more accurate to say that a close look at the discussion shows that we have been asking the wrong question!

Throughout this dissertation, a number of thorny but important philosophical issues have inevitably been encountered, but because the purpose of the previous chapters has been mainly the exegesis of the views of others, these matters were for the most part set aside without critical discussion. Foremost among these problems are the two raised at the start, the definition of individual languages and of linguistic meaning. The latter problem I will largely *laisser tombè* in the present work. Katz and Keenan, the main protagonists of the translatability discussion, approached it with different concepts of meaning; for Katz, the theory of semantic representations set out in *Semantic Theory* (1972, sketched in Chapter II, §3), for Keenan, a mainly truth conditional account largely cashed out in terms of entailment relations (1974, see Chapter II, §§4 and 6.3). But there was enough common ground between these positions, especially in that they both required that synonymous sentences have exactly the same entailment relations, to allow a definite framework for the discussion of translatability, and these

[143] As a reminder, ***T*** states that for *any* sentence of *any* natural language, *every* other natural language has some sentence that is equivalent in meaning. See Chapter II, §0 for a full definition.
T', introduced in Chapter II, §6.3, is a weaker principle suggested by von Fintel and Matthewson (2008), and not due to Katz. It is identical to ***T*** except that it does not require that a sentence share all of its presuppositions with its translation.

terms were more or less accepted by future authors such as Matthewson and Deal. Although this has been well-defined enough of a definition to allow the discussion to get under way, we might have reservations about whether this formal way of defining meaning, which abstracts away from context and conditions of use, is the most interesting tool for the investigation of translation. But I will not press this point, because we will see that after we resolve our other major problem, that of defining what a language is, the question of what theory we use to assign meanings to sentences becomes largely a moot issue as far as translatability is concerned.

Most of the discussion of translatability has relied on the folk, or intuitive, notion of a language as a public entity which is used by a population of speakers and is in some vague way bounded in time and space. However, this has led to a number of unresolved problems. For instance, different authors have expressed conflicting opinions on how far a translator might supplement a given language in order to obtain a translation before that language loses its identity and becomes a different language, and indeed it seems that any line we draw will be more or less arbitrary (see discussion, Chapter II, §5). These sorts of issues call attention to the theoretical intractability of the notion of a public language, already pointed out in a separate context by Chomsky (1986, 1997), and they suggest the need to bring to the discussion an entirely different conception of the entities being studied. In this chapter, I will argue that the consideration of translatability underscores the correctness of Chomsky's observation that language is fundamentally a matter of individual psychology, and the folk, or external, notion should be replaced by that of an *I-language*, a computational system internal to the mind of a language user.

Once the move has been made to discussing translatability in terms of I-languages, we are left with a question of quite different flavor than that which has been debated in the literature.

As will be discussed more fully in what follows, I-languages produce structures which, among other things, can be used to form sentences, but which themselves have no meanings. Since a speaker can use these structures in a vast number of ways to express themselves, drawing on resources from outside the language faculty strictly speaking, it becomes difficult to maintain the distinction that we drew in Chapter 0, between *translatability*, a question about the relative expressive power of languages, and *communicability*, a question about the resources a speaker has to make themselves understood. However, there is still an interesting, if rather different, sort of translatability question that we can probe. The exact shape of the structures that an I-language produces will place constraints on how a speaker uses them, and these constraints will vary among different configurations of I-languages. The investigation of the form these constraints take, and what effect they have on how a speaker communicates, promises to be an interesting and fruitful line of inquiry.

In the first section of this chapter, I will provide some general background on how the individuation of languages has been addressed (or more often, not addressed) by the various authors we have looked at so far. In the second section, I will examine the notion of an external, public language, or E-language, that has been assumed in the literature, and two ways that a public language might be conceptualized, the folk notion of a shared system of communication or as an abstract set of sentences. In the next section, I will introduce Chomsky's notion of the I-language, and I will discuss how translatability might be defined in these terms. I will conclude with a brief note about how we should frame future research.

§1 What is a Language?

In the introduction to this dissertation, I raised the issue of the individuation of languages, and suggested that providing clear criteria was critical to resolving the question of translatability-

which, after all, is a question concerning the relative expressive power of individual languages. Although I postponed resolution of this issue, it has been hanging over the entire conversation, and has occasionally come to the fore. The time has come to tackle this thorny problem, but the answer I suggest will have more of the form of cutting the Gordian knot.

Most authors involved in the discussion of translatability (e.g., Sapir, Jakobson, Matthewson) have left the question of language individuation untouched, resting on an intuitive understanding of what it is for a speaker to use one language as opposed to another. Others have avoided the issue by putting things more in terms of effability, or the capacity of human language in general (e.g., Frege, Tarski, Searle, Katz most of the time). Although, as discussed previously in Chapter II, §5, Keenan, and Katz both provided somewhat loose definitions of a language as a set of sentences, neither elaborated how such sets are to be individuated. Indeed, Katz, although he wrote an entire book arguing that a language is a set in the abstract mathematical sense, simply stated that a class of those sets which are sufficiently overlapping constitute a language (Katz 1981). He then declined to go any further into this matter or to clarify what was meant by *sufficient*, instead noting (not without some justification) that the individuation of languages was problematic on any definition.

This lack of concern with precise definition is somewhat surprising. This is especially so for Katz and Keenan, two authors whose work was otherwise characterized by great precision (e.g., Keenan 1972, 1975a; Katz 1972). But all of the authors involved, at least for the past few decades, have been in agreement in that they understood the question of translatability to be ultimately an empirical one. Even if translatability is fundamentally a hypothesis that is motivated by a theoretical view about the nature of human language, it should be open to falsification by the comparison of actual natural languages (NLs). But without a precise

specification of *language*, it is not possible to carry out this comparison in a manner rigorous enough to actually provide a firm answer to the question at hand. Data may be compiled from tests of native speakers and bilingual informants. However, in the absence of a definition of the entities under investigation, this data concerns only the linguistic behavior of individuals at a given time, rather than the expressive capabilities of languages.

One way of understanding the problem is that translation can be described mathematically as a mapping from the sentences contained in one set, the SL, to those of another set, the TL. The exact definition of the mapping function will depend on what semantic properties we feel must be preserved under the mapping, e.g., truth conditions, entailments, presupposition structures, and so on, in order to arrive at a translation considered to be satisfactory. In the actual literature, the focus has largely been on entailment relations and presuppositions, but in any case a principle of translatability such as $\boldsymbol{T}$ or $\boldsymbol{T}'$ is the claim that that the translating function, however it is specified, will always be a *total* one between every pair of languages, in the mathematical sense that the function is defined for every element in the domain. This claim cannot be evaluated for any pair of languages if we are unsure what the elements contained in the domain are.

The matter is further complicated by the fact that languages are protean, ever changing entities. As Deal noted, we will come to different results about translatability depending on whether we view it as a question about languages as they are at a given time or about languages as temporally extended, evolving entities (Deal 2014, see Chapter II, §5 and Chapter III, §3.3). This was a point that Katz and Keenan acknowledged, but passed over rather quickly given its importance (Katz 1978; Keenan 1978, see Chapter II, §5). Keenan briefly argued that the correct way to discuss translatability was to take languages "as they stand" (1978:271), but a moment's

reflection shows how difficult it would be to fix the description of a language at a precise moment, especially for languages that are widely spoken and used by diverse populations.

As mentioned in the introduction to this chapter, I have skirted these issues in order to facilitate a discussion of the literature. This has been interesting, and we have even managed to identify a tentative conclusion regarding translatability. But I will now argue that we should redefine the question in more precise terms. This is desirable for a number of reasons. First, it will ensure that participants in the discussion of translatability are not talking past one another. It will allow fruitful future research on the topic, research that is better integrated into other aspects of linguistic science, such as the study of language acquisition and change. Finally, and not of least concern, it is more philosophically satisfying to work with well-defined entities whenever possible.

§2 External Languages and Their Problems

Chomsky (1986) uses the term *E-language*, for *external* (to a speaker), to describe the notion of a language as a public entity that exists somehow outside of the speakers (In what follows, I will use the terms *public language* and *E-language* interchangeably). As we have seen, it is this E-language concept that has been used in the literature on translatability. In this section, I will argue that this notion of language is unsuitable for assessing translatability. There are at least two reasons for this. The first is that this concept of language is rarely explicitly defined, and so there is no guarantee that when authors debate translatability they have the same sort of entities in mind. It might be unclear, for example, whether pidgins count as a natural language, and so whether it would be a counterexample to translatability if some sentence of a natural language could not be translated into a pidgin. But as we will see, it is difficult to propose a

theoretically tractable definition for an E-language. Secondly, as has frequently been pointed out, public languages are vague.

This second objection may strike the reader as surprising or unfair. After all, it has been pointed out that vagueness need not be a stumbling block to inquiry:

> Failing to have precise individuation conditions is surely not a sufficient reason to deny that an entity can be studied scientifically. 'Language' as a count noun…is vague, but this need not be any greater obstacle to theorizing about them then is the vagueness of other terms for historical entities without clear individuation conditions, like 'species' and 'individual organism' in biology. (Scholz et al. 2016)

This is fair enough for most purposes. The philosophy of language and the science of linguistics have made tremendous advances without attending on a precise definition of language. But vagueness is a major problem for translatability, because it makes it impossible to assess what the expressive resources of a language are. Let us consider just a few examples. Hale (1975) discussed the introduction of the English number system into Warlpiri, a previously anumeric language. During the period in which this transition took place, over several decades, was Warlpiri anumeric? Is there a principled way to make a decision on this count? Keenan (1978, Chapter II, §3.1) proposed a counterexample to ***T*** that involved the impossibility of translating a certain English sentence in Malagasy. Part of his case that there is no equivalent sentence in Malagasy hinged on the fact that speakers of that language do not interrupt the stream of speech to offer parenthetical information. But we might well imagine that if one did choose to do so, the sentence produced would be comprehensible. Is this sentence contained in the Malagasy E-language, or not?

In another proposed counterexample to ***T***, Keenan (1974; see Chapter II, §6.3) asserted that the best English translation of some Hebrew sentence was "This is the woman that I know the man that gave to her a book", and that this is not a sentence of English. Keenan relies on the point that this ungrammatical in most dialects of English. But it is clearly interpretable. As Chomsky pointed out, it seems wrong to say that sentences like this either are, or are not, in English considered as an E-language[144]. The sentence is ill-formed (for reasons which most English speakers would be hard-pressed to consciously identify), but an English speaker will assign to it a meaning, quite different from the interpretation a Francophone would assign, and "Hence it cannot simply be excluded from the set 'E-English'" (Chomsky 1997:3). The point of this example is not that Keenan is wrong, but that we would like to rest our judgement about this case on a firmer theoretical basis, where such questions could receive a principled answer.

I should reiterate before proceeding that my point is not that E-languages are not interesting for any purpose, or that they are not a proper object of linguistic inquiry, as Chomsky has occasionally asserted. But they are not a proper tool for the discussion of translatability. I should also concede that, although a great deal of my argument rests on the vagueness of E-languages, *total* precision in the definition of a natural language is probably unattainable no matter what notion we are using. But we do have alternatives at hand that are much better in this respect than the E-language concept. I will turn to this point in the next section. Having taken it as now established that precision matters for the discussion of translatability, I will continue for the rest of this section to build the case against E-languages.

There are, broadly speaking, two ways that external, public languages are conceived. The first, more widely used, concept of external languages is the *folk*, or pre-theoretic, notion, which

[144] The example which Chomsky used was "The child seems sleeping" (1997:3).

is more or less of a public communications system such as English, French or Stat'imcets, shared by speakers associated with a certain geographic space and period of time. The latter view has certainly been implicit or explicit in the work of most philosophers of language throughout the 20th century. For Wittgenstein and his followers, language is a social phenomenon, on par with the other cultural practices of the speakers (Wittgenstein 1953). Dummett stated that a language "…is constituted by rules it is part of a social custom to follow" (Dummett 1986:473). Lewis held language to be a set of conventions shared by a group in order to facilitate coordination (Lewis 1969,1975). This outlook has also been influential in the discussion of translatability, and of translation in general. However, it in many respects a deeply problematic notion, especially in terms of the individuation of languages, which is clearly important for the present purposes.

The difficulties with the folk notion of language are well known enough that I will be fairly brief. Folk languages are typically individuated in terms of mutual intelligibility (Scholz et al. 2019). As long as two speakers can communicate without the need for translation, then they are speaking the same language. It is obvious that this definition fails to correspond to the way that languages are popularly labelled. Swedes and Danes -nominally speakers of different languages- can communicate without translation, as can Spaniards and Italians, and to a lesser extent Poles and Slovaks (Gooskens et al. 2018). At the same time, speakers of various dialects of Chinese or Arabic can often understand each other only with serious difficulty, if at all. However, this is not simply a question of mislabeling that could be corrected by redrawing the boundary lines more carefully. Intelligibility is a continuum, rather than an all-or-nothing affair. For instance, Danes speaking their everyday language are 56% comprehensible, under test conditions, to Swedish speakers, while Germans are 37% understandable to the same listeners (Gooskens et al. 2018:180). If we search for a certain percentage to serve as a cutoff point, one

set too low leads to absurdity as we would find two speakers of nominally the same language who can barely communicate, while setting it too high would equally have counterintuitive results (e.g., Americans and Irish persons would be speaking different languages). Any particular level would be arbitrary, especially since exact test results would be highly variable, depending both on the test used and the exact segment of the population undergoing testing.

In addition, even the idea of "speaking without the need for translation" is itself a very slippery notion. If this means to be able to employ any sentence of the language without modification, then this situation hardly ever obtains between *any* two speakers, even within the boundaries of the same folk language. A physicist expounding a theory to a layperson who was nominally a speaker of the same language would typically find that an enormous amount of paraphrase and simplification would be necessary to even approximate what she is trying to convey. This recalls Jakobson's point that translation is the norm within, as well as between, languages. On the other hand, speakers of related languages, or even unrelated languages that have come to share a fair amount of vocabulary (e.g., Swedish and Finnish), can often make themselves understood reasonably well across some limited domains simply by speaking to one another without any modification other than perhaps slowing down. Besides, *understanding*, *intelligibility* and *comprehension* are all notions that extend well outside of language, as interlocutors exploit context, non-verbal cues, shared culture, and general theory of mind in order to figure out what other speakers intend to convey. Glossing over this fact has been a major problem with the discussion from the beginning, one which the move to I-languages will do a great deal to ameliorate.

Whether some suitable resolution is possible for the preceding issues, mutual intelligibility is an unsuitable means for establishing identity, as it cannot be used to define an

equivalence class (Scholz et al. 2016). It is not a transitive relation; French persons speaking their own idiom are well understood by Italians, who in turn are well understood by Spaniards, yet the French are only marginally understandable by the Spanish (Goskins et al. 2018). In fact, intelligibility often fails to even be symmetric; for instance, Romanians understand a great deal of the speech of Spaniards, Italians and French, but the converse relation does not obtain (Gooskens et al. 2018). This situation is also common within national borders, where the speech of prestige or majority groups is generally understood by minorities but not the converse (Sholz et al. 2016).

Public, external, languages are held to be associated with a human population that is somehow bounded in time and space, so that we can identify persons as speakers of a particular language or languages. But it is generally not possible to say with any certainty where one language begins and another ends. Chomsky (1980) discusses the speech of German citizens who live near the Dutch border; this idiom is not intelligible to Germans from further south but is easily understood by the Dutch. Only the location of the border, a nonlinguistic phenomenon, makes this speech part of the "German language" rather than "Dutch" or a third language[145]. A similar situation obtains in the Alps around the French-Italian frontier (Sholz et al. 2016). The population in this area is concentrated in a series of valleys running roughly parallel to the border. Those living in each valley can communicate with their neighbors more easily than with people living further away in either direction, but no clear line can be drawn to separate speakers of different languages. While observations such as this are not always relevant in language

[145] Katz discussed this passage at one point: "[Chomsky is] is claiming that notions like 'English', 'French', etc….. are not proper concerns of linguistics. This is like claiming that the concept of number is not a concept of mathematics, but a socio-political one" (Katz 1981:79). This is a somewhat remarkable quote for a number of reasons. Most notably, it completely fails to address Chomsky's worry that E-languages are ill-defined, instead offering a dubious metaphor with mathematics. Numbers are indisputably the subject matter of mathematics; it is begging the question against Chomsky to claim that the folk notion of language that Chomsky is discussing has the same status in linguistics.

science, they are important for our purposes. For instance, if French is our TL, do we allow a particular sentence formed in the dialect spoken in one of these valleys but not in Paris to count as French? On what basis do we look to in order to make such a decision?

Even if we could somehow identify a public language, we would find it to be in a constant state of flux. New words enter into the lexicon of English, for instance, much faster than one a day[146], and the syntactical rules of a language also change, albeit usually at a slower rate. Thus, for example, there were reversals in word order between medieval and modern English, as well as between Homeric and Biblical Greek, and in both cases the different orders overlapped through a long transition period (Kroch 1994). Another worry along these lines, related to the issue of *open texture* (Wasserman 1945), concerns the judgements that speakers might apply to word use in counterfactual situations. Consider whether an English speaker would call a mile-high house cat a *cat*, or a biological cyborg a *robot*. Or, less fancifully, whether a newly discovered rocky orb of a certain size is a planet. Judgements will vary, and it seems that there just is no fact of the matter about the correct answer.

Looking within the boundaries of what is nominally the same public language, all of these issues occur here as well, at a finer grain. In any community of language users, there are pockets of speakers employing specialized vocabulary for science, mathematics, logic, music, sports, religion, hunting, agriculture, etc. A member of one of these groups will frequently find themselves needing to translate when speaking with outsiders, even ones from the same geographic area. Often, as in the case of mathematical or scientific vocabulary, translations will not be readily available, or may be so unnatural and convoluted that the only practical approach is to instruct the target audience in the use of the new words. For example, a work on logic

[146] Based on the rate at which words are added to the Oxford English Dictionary, https://public.oed.com/updates/

written by a German would need to be translated to be accessible to most American logicians. But this new version would require a second translation (which would involve a much more drastic transformation in terms of content, assuming it would be possible at all) in order to make its contents accessible to Americans without specialized training.

These considerations apply not only to vocabulary, but to syntactical rules. *Double modal* constructions, e.g., "you might should apply" or "no one might would notice" are acceptable in many regions of the Southern United States (Di Palolo 1989) but by no means universally, and are often intelligible only with effort outside of these areas (Huang 2011). Similarly, "don't nobody know" is acceptable in African American Vernacular but not in Standard American English (Pinker 1994:17), demonstrating that even within the same geographic community speakers will exhibit variations in the rules that they adhere to. Along these lines, we might consider once again the status of what Chomsky called "semi-grammatical sentences", such as "the child seems sleeping" or "this is the woman such that I know a man who gave to her a book" (see page 5). Much of actual discourse consists of such phrases, and the status given to them will vary across communities even within a single public language, or even from occasion of use to occasion of use. Consider that "No dogs in park" is acceptable on a posted sign, or "president shot" as a news headline, but not as spoken English. These are important problems, since many issues of translatability hinge on the availability of certain constructions given the grammar of a particular language.

Reflecting on these examples, which could be supplemented virtually endlessly, we find that, rather than a single set of "English" speakers (or "French", or "Swahili" …) whose speech is mutually intelligible, or who share the same lexicon and syntax, we find a vast number of overlapping sets whose members follow more or less the same syntactical rules and whose

vocabulary is similar, and who as a result can understand one another to some degree or another. Of course, these sets will often straddle the boundaries between what have traditionally been considered languages, and further, these sets are not mutually exclusive since any speaker will be located in the intersection of several of them. These sets might be drawn differently depending on the purpose at hand, and, importantly, the only limit to how finely they can be individuated is at the level of the individual language user.

The second notion of E-language that appears in the literature is as an abstract set, a mathematical object, of which a speaker somehow has knowledge. This was the definition favored by Katz and Keenan (Katz 1972,1981; Keenan 1978; see Chapter II, §5), and it can be held in various strengths. For Keenan, it seems to have been essentially a methodological move, while for Katz it was a metaphysical position which became more and more central to his work over time. In fact, it was this Platonic ontology which eventually led to his acrimonious split with Chomsky and the mainstream of generative linguistics. In any case, the view endorsed by Katz, who developed this line of thinking to the fullest extent, was that all possible sets of sentences exist in a Platonic realm; certain classes of these sets constitute the NLs. The study of language is the study of the sets and their elements, a branch of theoretical mathematics which would subsume translatability, sharply separated from the study of how speakers acquire and employ knowledge of these sets, a branch of psychology. If we do not wish to observe this methodological stance, this might be considered a first reason to be hesitant as regards this approach.

More importantly for our purposes, this definition does not overcome any of the problems mentioned above for the folk notion; it is still unclear- even in principle- where one language begins and another ends. Katz proposed that a class of sets of sentences with sufficiently large

intersections constitute a language, e.g., one class of such sets would be English, another would be German, but he did not provide any more specific criteria. Instead, he shrugged the problem off by noting that "Platonism faces no special problem… the line drawing problem is a problem for everyone" (1981:9). So, although there is a determinate fact of the matter as to what sentences are in any one of these sets, there seems to be no fact of the matter, or at least no way to determine, what sentences are part of a *language*. We might study the mapping functions between the sets themselves, but this is an endeavor without a great deal of obvious interest. Therefore, we might conclude that the Platonic definition of languages offers little advantage to the study of translatability.

Or, perhaps the best way of putting it is Chomsky's response that "people may study whatever abstract objects they construct", but it is unclear what we expect to learn about language with such a technique. The burden of proof would be on the advocate of the Platonic approach to show how, as either a methodological or metaphysical approach, there is any advantage to such a way of attacking translatability.

Once again, I stress that this is not meant to propose that languages, as traditionally understood, cannot be profitably studied for many purposes. In fact, something like the folk concept of a language is necessary for conducting work on many aspects of language, for example, sociolinguistics. But it is clear that the investigation of translatability cannot be carried out in the terms under which it has so far been discussed. We cannot provide criteria to individuate public languages, nor can we define boundaries in space for them. This is not an epistemic limitation due to the state of our knowledge, but rather a fundamental result stemming from the nature of the entities under discussion: public systems of communication are not the sort of things which can be individuated. As a result, we cannot precisely state what sentences

belong to any particular public language, since the lexicon and even syntactical rules are not sharply defined, and as a result, there is no definitive answer on what meanings, or propositions, can be expressed in a given language. It makes little sense to ask whether the contents of one set can be mapped onto the contents of another when there is no definitive answer to the question of what is in either set in the first place.

Given these considerations, if we wish to discuss translatability, we have two options. One would be to turn to a different definition, the other would be to work with some kind of idealized approximation, a method often employed elsewhere in the sciences (e.g., frictionless planes in physics, rational agents in economics). But it is not clear what role such entities, e.g., *ideal English,* would play in this line of research. Contrast this to the case of a physicist who abstracts away from some real world phenomena, for instance calculating the effect of gravity on an oddly shaped asteroid as if it was a perfect sphere. These idealizations have a clear pay-off in that they make the physicist's calculations tractable, and allow her to infer some data about real world phenomena, the movements of the asteroid through space, as long as the margin of error introduced by the idealization is kept in mind. In contrast, it is not obvious what information about anything in the world we could gather by considering the limits of translation between idealized E-languages. Or, consider the *General Gas Law*, which is based on assumptions about the properties of a gas (e.g., that no outside force acts on the molecules of the gas) that do not obtain for any really existing substance. Quine (1960) observed that the closer a gas approaches these properties, the more accurately the General Gas Law, which has Boyle's Law as a special case, describes its behavior. But its not clear what the linguistic analog of these sort of assumptions would be, nor what it would mean for an E-language to approach them or not.

Perhaps this sort of technique cannot be ruled out *a priori*, but it remains to be seen what these approximations would consist of, how they would be used, and what their relevance would be.

It would seem that if we had a better definition of language at hand, that would be the preferable approach. Fortunately, we do have such a definition on offer.

§3 Internal Languages and Translatability

A different sort of definition is available, one more suitable for the task at hand. As noted in the last section, a linguistic community consists of a number of overlapping sets of speakers who share the same lexicon and syntactic rules to varying degrees, and these sets might be cut more and more finely until we arrive at the level of the individual speaker. This suggests a solution: individuate languages at that level. Thus, *a language* can be defined as the grammatical and lexical resources internalized by a particular individual, ultimately, as a property of a single mind. This approach offers a neat solution to the problem of defining and individuating languages. In this section, I will first discuss the I-language concept, and then how the translatability question might be posed in terms of I-languages. The reader should be forewarned that when we are finished, translatability will look like a much more tractable but in some respects substantially different question; notably the central but somewhat nebulous concept *of relative expressive power* will drop out of the picture.

The I-language concept was proposed by Chomsky (1986), the *I* pointing to *individual,* and *internal*, reflecting the shift away from the conception of a public system to something internal to the mind of an individual. In the framework of generative linguistics, which postulates an innate, biologically given, language faculty, "an I-language…is the state attained by the language faculty under certain external conditions" (Chomsky 1986:12). In other words, an I-

language is a form into which the language faculty develops as a speaker matures, a computational system which arranges lexical items into linguistic structures. Both the constitution of the lexicon and the exact shape of the computational procedures would be given by the linguistic environment that surrounds a speaker during the formative language learning period. This accounts for the fact that I-languages might be more or less similar, depending on the linguistic data that shape them; two French persons will generally have I-languages which resemble one another much more closely than the I-language of a Mongolian, and the closer the speakers are in terms of age, socio-economic grouping, and other non-linguistic factors, the closer their I-languages are likely to be.

It is important to clear up one possible misconception before proceeding. An I-language is a computational system, which, among other things, handles the production of structures that can be externalized as sentences. It is not an *idiolect*, an E-language spoken by a single speaker (which would make all communication a form of translation). This critical point is often missed, but it is especially important in the present context, since if we treat languages as idiolects we are still left with many of the problems enumerated in the last section, especially concerning the status of semi-grammatical sentences and change over time.

The fact that an I-language is a computational system, responsible for the production of linguistic structures, allows an answer to how we might define identity criteria for these languages. I-languages might be individuated in the way that any computational system is individuated, in terms of its program. Importantly, crosslinguistic study shows that syntax, the program of an I-language, does not vary indefinitely, but rather in predictable ways among a finite number of possibilities (Chomsky 1981,1995; Baker 2001,2010; Lasnik and Uriagereka 1988). This should allow the output of these programs to be compared systematically.

Unfortunately, a note of caution should be sounded. The exact nature of these programs is not well understood at this point. In an earlier stage in the development of generative linguistics, the *principles and parameters* theory, it was proposed that all languages share a set of fundamental *principles*, while linguistic variation is the result of the different settings in individual languages of binary *parameters*. A useful analogy for the I-language on this view is with a very early electronic computer, of the type programmed by a set of switches on a front panel: moving a switch to a different value changes the program being run, and so the output of the machine will change. As the theory developed, it became apparent that this was an overly simplistic view. Many of the supposed parameters, e.g., ergativity, cannot be divided into binary values (Trask 2002), and the effects that result from the setting of various parameters appears to be dependent on the settings of others in complicated ways (Allot, Lohndal and Rey, forthcoming). Such considerations have resulted in a split between researchers who continue to concentrate on something like the traditional view of parameters as key points of difference in syntax (e.g, Baker 2008,2010) and those who see these *macroparameters* as emerging from *microparameters*, the features of functional lexical items (Kayne 2005). The latter is the view incorporated into Chomsky's minimalist program (Chomsky 1995).

However, there is no need to resolve these debates in this dissertation. I will follow the lead of those still working in the older framework (e.g., Baker 2010) and continue to use the term *parameter* (partly because I am partial to that paradigm and partially to facilitate the discussion). A well-known example of a parameter is the *pro-drop* parameter, which is set to one value in the I-language of most French speakers, and a different value in the I-language of speakers of most

other Romance languages[147]. Thus, in Spanish, Portuguese, etc. the subject of a sentence may be left up to context, but not in French[148] (Chomsky 1986). Likewise, the *head directionality* parameter of English takes one value, that of Japanese takes another, so that English noun phrases begin with a noun, verb phrases with a verb, and so on, while Japanese is nearly the mirror image (Chomsky 1986; Baker 2001). The important point is that I-languages are computational systems which can be configured only in a finite number of ways, varying along choice points such as the order of phrases, although the nature of those configurations is a matter of some debate.

This is an advance over the discussion of E-languages. We have a clear criterion of individuation: an I-language is a program for a computational device. Exactly which programs are actually found in human speakers, and along what lines they vary is not yet entirely clear, but we do not have to wait for this to be entirely resolved to compare the output of various programs in order to study translatability. As linguistic science approaches an answer to what I-language configurations are actually found in humans, we can further refine our investigation. Let us now consider what translatability might look like, construed in terms of I-languages.

Does the setting of parameters affect the relative expressive power of a speaker? Actually, this may not be the correct way of putting the question. The structures produced by the I-language are used by a speaker in myriad ways, including but not limited to, the production of sentences. To express themselves, speakers may supplement the resources of their I-language by

[147] It has been observed that "History has not been kind to the Pro-drop Parameter as originally stated" (Baker 2008:351). However, the basic idea is still relatively intact when discussing the Romance languages specifically, and it is used here because it is simple and well-known enough to provide a convenient illustration (to be given shortly).

[148] It is often convenient to continue using labels left over from folk linguistics, such as *French*, and I will continue to do so without employing quotation marks or other disclaimers. However, it should be remembered that in the present context these labels are to be understood as referring not to public languages, but to patterns generally shared by the I-languages of certain populations.

relying on context, making use of shared cultural knowledge, gesturing, or with other extra-linguistic resources. For some purposes they can make use of symbols from outside of natural language (e.g., mathematical notation, logical symbols, chemical signs like H_2O) to give form to complex propositions. Indeed, as a matter of communication, the uses to which a speaker might put the output of their I-language is virtually limitless, bounded only by the human imagination. However, there is still an important sense in which the production of grammatical sentences is constrained by the parametric settings of the I-language, and this one place where interesting results regarding translatability might be found.

Consider, for example, the pro-drop parameter, which can trigger translation problems along the lines of the presupposition issues raised by Keenan (see Chapter II, §6.3 and Chapter III, §1). A French speaker faces a dilemma when translating into her own idiom a Spanish sentence in which the subject is left up to context. Her I-language will not produce a structure that can be used to form a sentence capturing the same pattern of asserting information and use of background knowledge. She may either explicitly state information (the identity of the subject) left up to context in the SL sentence, or translate literally, going against the parametric settings of her I-language to produce an unacceptable sentence fragment, formed with French vocabulary but not belonging to any language. This point once again brings to mind Jakobson, especially his famous observation that languages differ not so much in what they *can* express, but in what they *must* express (1959). Notice, however, that the fragment may well be interpretable in context to French speakers, underscoring the fact that that translatability is not really a question of expressive power, as has typically been assumed. From an E-language perspective, we would have another difficult question concerning a semi-grammatical sentence that cannot be clearly assigned to French or entirely outside of it. From an I-language

perspective, there is no such problem. An I-language without the pro-drop parameter will not produce the structure underlying such a sentence, although a speaker, who is not a drone governed by her I-language, may choose to speak such a sentence for whatever reason.

Let us examine one more example, that of Kalaallisut (Bittner 2005; discussed in Chapter III, §5). That language is said to be strongly tenseless, that is, sentences have no overt markings or auxiliary words locating the time of events under discussion relative to the time of utterance. However, it is notable that speakers of that language are not at a loss when translating from English. For instance, simple statements about future events (e.g., "We will do X") are often rendered as statements about mental states (e.g., constructions equivalent to "We expect/plan to do X"). From a truth-conditional standpoint, or the standpoint of a formal semantic theory such Katz's, these are very different expressions. But it is another question whether the two expressions are understood as conveying the same, or different, meanings by speakers of the relevant languages. Ultimately the truth of whether these constructions are equivalent likely varies from use to use, just as whether English speakers accept "We will do X" and "We plan to do X" as meaning the same thing for certain purposes, and not for others. The conclusion that we can draw about this case, given the way that we are now framing the translatability question, is that the I-language parameter governing tense is set differently between Kalaallisut and English, and this has a detectable effect on the means by which future events are discussed.

In previous chapters, we have seen a number of examples of the effects of syntax on what meanings can be expressed by the grammatical sentences of a given language. Recall that Keenan's argument against Katz concentrated on these sort of cases (1974,1976,1978; see Chapter II, §6.3 and Chapter III, §1). Although these examples are not expressed in terms of I-language parameters (Keenan was writing some years anterior to those theories) they fit well in

that framework. Examples include translation issues that arose from the inability of some languages to form constructions equivalent to the English passive voice, the ability of some languages to form relative clauses unavailable in English, and the presence in some languages and not others of switch-reference. All of these can be recast as questions of what sorts of constructions can be formed by particular I-languages, as can the interactions between modals and negation that lead to translation issues concerning English, Yaqui, and Nez Perce (Chapter III, §3). Putting things in terms of I-languages allows us to avoid the conceptual and practical issues, enumerated in the previous section, inherent in discussing translatability in terms of E-languages.

A final point worth discussing is that the present position fits nicely into the program of *intensional semantics* developed by Chomsky (2007) and Pietroski (2003, 2005, 2018). This view takes its motivation from the ubiquity of polysemy in NLs. Pietroski noted that *line* can refer to the lines of geometry, telephone lines, lines in the sand, a line of reasoning, and so on; *door* can refer to a physical object that is on hinges or a gap in a wall (2018:5). It is highly counterintuitive that these lexical items would simply have many completely different meanings, especially given that all of these uses seem related in some recognizable way. Pietroski argues that this indicates that lexical items are pointers in semantic space, instructing the mind to retrieve a certain representation; in the case of polysemous lexical items these representations bear a family resemblance to one another.

This ties in to the current view, in that on the intensional theory of semantics, these lexical items are combined into structures by the I-language which can be used to form sentences, and these in turn can be used by the speaker for various purposes. Sentences might be used, among other things, to make claims about the world, but the truth conditions will vary from

use to use- just consider the classic example of "I know that I am not a brain in a vat". This reinforces the intractability of using truth conditions, entailments, or other formal properties as criteria for assessing the translatability of sentences, since these vary across contexts and with the intent of the speakers. But we can intelligibly ask the question of what sort of structures are generated by a certain I-language configurations, and how this might constrain the means available to the speaker to express themselves.

To sum things up, the question that we have arrived at is really more of a question of *how* translation can be done, in problematic cases, rather than a theory of *whether* translation can be done in those cases. At one point Deal (2011:576), discussing how speakers translate recalcitrant meanings, states that

> In practical terms, the answer to such question is always the same: speakers rephrase, they paraphrase, they make do. On a theoretical level, what is of central concern is how accurately periphrastic means are able to communicate a meaning that the grammar does not especially encode.

The position that I have come to here largely agrees with this statement, but I would reduce *how accurately* to simply *how*, and what effect the varying parameters of I-languages have on what means are available.

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Translation and translatability are vast topics, but time is finite and many interesting aspects of this subject will have to be reserved for future work. At this point, I wish to thank the reader for his or her patience and interest. *Merci beaucoup*!

Sources

Akmajian, A., Farmer, A., Bickmore, L., Demers, R., Harnish, R. 2001. *Linguistics: An Introduction to Language and Communication*. Boston: MIT

Albrecth, Jörn. 1973. *Linguistik und Übersetzung*. Tübingen: Niemeyer

Allan, K. 1983. Review of *Language and Other Abstract Objects* (Katz 1981). Language. 59(3): 678-683

van der Auwera, Johan and Ammann, Andreas. 2013. "Overlap between Situational and Epistemic Modal Marking". *The World Atlas of Language Structures Online* (Dryer, M. and Haspelmath, M. eds.) Leipzig: Max Planck Institute for Evolutionary Anthropology. http://wals.info/chapter/76

Aoki, Haruo. 1965. *Nez Perce Grammar*. Doctoral dissertation in linguistics, University of California Berkeley. https://escholarship.org/uc/item/0fx0928s

Austin, P. 1981. "Switch-Reference in Australia". *Language*. 57: 309-334

Baghramian, M. and Carter, A. 2018. "Relativism". *Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/archives/win2018/entries/relativism

Baker, M.-

2001. *The Atoms of Language*. New York: Basic Books

2008. "The Macroparameter in a Microparametric World". *The Limits of Syntactic Variation* (Biberauer, T. ed.). Amsterdam: John Benjamins. 351-374

2010. “Formal Generative Typology”. *The Oxford Handbook of Linguistic Analysis*. (Heine, B. and Narrog, H. ed.). Oxford: Oxford University Press. 285-312

Baker, M. 2008. “Translation Studies”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Bar-Hillel, Y. 1960. “The present status of automatic translation of languages”. *Advances in Computers* (Alt, F. ed.). New York: Academic Press. 91-163

Bar-On, Dorit-

1992. “Semantic Verificationism Linguistic Behaviorism and Translation”. *Philosophical Studies*. 66(3): 235-259

1993. “Indeterminacy of Translation: theory and Practice”. *Philosophy and Phenomenological Research*. 53(4): 781-810

Bell, R. *Translation and Translating: Theory and Practice*. London: Pearson

Black, Max. 1959. “Linguistic Relativity: The Views of Benjamin Lee Whorf”. *The Philosophical Review*. 68(2): 228-38

Berlin, B. and Kay, P. 1969. *Basic Color Terms: Their Universality and Evolution*. Berkeley: University of California Press

Berwick, R. and Chomsky, N. 2016. *Why Only Us*. Boston: MIT Press

Biletzki, A and Matar, A. 2020. “Ludwig Wittgenstein”. *The Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=wittgenstein

Blackburn, P; Rijke, M; Venema, Y. 2001. *Modal Logic*. Cambridge: Cambridge University Press

Bittner, M.-

2005. “Future Discourse in a Tenseless Language”. *Journal of Semantics*. 22: 339-387

2007. “Aspectual universals of temporal anaphora”. *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect* (Rothstein, S. ed.). Amsterdam: John Benjamins. 349-385

Bloom, P. and Keil, F. 2001. “Thinking Through Language”. *Mind & Language*. 16(4): 351-67

Bloomfield. 1933. *Language*. New York: Holt, Reinhart and Winston

Bonfante, G. and Bonfante, L. 2002. *The Etruscan Language: an Introduction*. Manchester: University of Manchester Press

Borg, E. 2004. *Minimal Semantics*. Oxford: Oxford University Press

Burge, Tyler. 1978. “Self-Reference and Translation”. *Meaning and Translation* (Guenther and Guenther-Reutter, ed). New York: New York University Press

Butt, M. 2003. “The Light Verb Jungle”. *Harvard Working Papers in Linguistics*. (Aygen et al. ed.). 9:1-49

Calbert, J. 1975. *Towards the Semantics of Modality*. Tubingen: Gunter

Caleiro, C and; Gonçalves, R. 2007. “Equipollent Logical Systems.” *Logica Universalis* 97–109.

Cancho, R. and Cole, R. 2003. “Least effort and the origins of scaling in human language”. Proceeds of the National Academy of Science. 100(3): 788-791

Carnielli, W. and D’Ottaviano, I. 1997. “Translations Between Logical Systems: *A Manifesto”. Logique & Analyse*. 157: 67-81

Carston, R. 2001. *Thoughts and Utterances*. Oxford: Blackwell

Cartwright, R. 1962. “Propositions”. *Analytic Philosophy* (Butler, R. ed.). Oxford: Basil Blackwell & Mott

Catford, J. 1969. *A Linguistic Theory of Translation*. Oxford: Oxford University Press

Chomsky, N.-

1965. *Aspects of the Theory of Syntax*. Cambridge, MA: The M.I.T Press

1973. "Introduction". *Language and Cognition*. (Schaff, A. ed.). New York: McGraw-Hill

1975. *The Logical Structure of Linguistic theory*. Berlin: Springer

1975a. *Questions on Form and Interpretation*. Lisse: The Peter De Ridder Press

1980. *Rules and Representations*. New York. Columbia University Press.

1981. *Lectures on Government and Binding*. The Hague: Mouton

1983. "Things No Amount of Learning Can Teach". *Omni*. 6:11, archived at https://chomsky.info/198311__/

1986. *Knowledge of Languages: Its Nature, Origin and Use*. Westport: Praeger

1990. "Language and Problems of Knowledge". *The Philosophy of Language* (Martinich, A. and Sosa, D. ed.). Oxford: Oxford University Press. 720-738

1992. "Explaining language use". *Philosophical Topics*. 20: 205-231

1995. "Language and nature". *Mind.* 104: 1-61

1995a. *The Minimalist Program*. Boston: MIT Press

1997. "Language and Problems of Knowledge". *Teorema*. (16)2:5-33

1998. *On Language*. New York: New Press

2000. *New Horizons in the Study of Language and Mind*. Cambridge: Cambridge University Press

2014. “Language Architecture and its Import for evolution”. Address to the Chomsky Amsterdam symposium. https://www.reddit.com/r/generativelinguistics/comments/2szxp8/language_architecture_and_its_import_for/

2017. “The Galilean Challenge”. *Inference*. (3)1 https://inference-review.com/article/the-galilean-challenge

Colapinto, J. 2007. “The Interpreter”. *The New Yorker*. https://www.newyorker.com/magazine/2007/04/16/the-interpreter-2

Comrie, B.-

1984. “Review of Ekkehart Malotki, Hopi Time.” Australian Journal of Linguistics”. 4:131-3

1985. *Tense*. Cambridge: Cambridge University Press

Conant, J. 1991. “The Search for Logically Alien Thought: Descartes, Kant, Frege and the Tractatus”. *Philosophical Topics*. 20(1): 115-181

Cottingham, J. 1984. *Rationalism*. London: Paladin Books

Davidson, D.-

1967. “Truth and Meaning”. *Synthese*. 17(1): 17-36

1974. “On the Very Idea of a Conceptual Scheme”. *Proceedings and Addresses of the American Philosophical Association.* 47: 5–20

1985.*Truth and Interpretation*. Oxford: Clarendon Press

Davis, Henry and Matthewson, Lisa. 2009. “Issues in Salish Syntax and Semantics”. Language and Linguistics Compass. 3(4): 1097-1166

De Caen V. 1996. “Tenseless languages in light of an aspectual parameter for Universal Grammar: a preliminary cross-linguistic survey”. *Toronto Working Papers in Linguistics*. 14:41–81

Deal, A.-

2011. “Modals Without Scales”. Language. (87)3: 559-585

2014. “Reasoning about equivalence in semantic fieldwork”. Methodologies in Semantic Fieldwork (Bochnak, R. and Matthewson, L. eds.) Oxford: Oxford University Press

Demirdache, Hamida. 1996. “Condition C”. Paper presented at Holland Institute of Generative Linguistics conference on Atomism and Binding

Despic, M. 2019. “On kinds and anaphoricity in languages without definite articles. *Definiteness across languages* (Aguilar-Guevara et al. ed.). Berlin: Language Science Press. 259-291

Dinwoodie, D. 2006. “Time and the Individual in Native North America.” *New Perspectives on Native North America* (Kan et al. ed.). Omaha: University of Nebraska Press

Di Paolo, M. 1989. “Double Modals as Single Lexical Items”. *American Speech*. (64)3:195-224

Dixon, R. 1980. “Speech and song styles: Avoidance styles.” *The Languages of Australia*. Cambridge: Cambridge University Press: 58-65

Downing, A. and Locke, P. 2002. *English Grammar: A University Course.* Abingdon-on-Thames, Oxfordshire: Routledge

Doyle, L., McCowan, B., Johnson, S., Hanser, S. “Information theory, animal communication, and the search for extraterrestrial intelligence. *Acta Astronautica* 68(3-4): 406-417

Epstein, R. (1990). *The semantic foundations of logic, Volume I: Propositional Logics*. Dordrecht: Kluwer

Euler, R. and Dobyns, H. 1971. *The Hopi People*. Phoenix: The Indian Trible Series

Evans, N.-

1995. *A Grammar of Kayardild*. Berlin: Mouton de Gruyter

2003. "Context, Culture and Structuration in the Languages of Australia". *Annual Review of Anthropology*. (32): 13-40

Evans, N. and Levinson S. 2009. "The Myth of Language Universals: Language diversity and its importance for cognitive science". *Behavioral and Brain Sciences*. Cambridge, UK: Cambridge University Press

Everett, C. "A Closer Look at A Supposedly Anumeric Language*". International Journal of American Linguistics.* (78)4: 575-590

Everett, D.-

1986. "Pirahã". Handbook of Amazonian Languages, vol. 1 (Derbyshire, D. and Pullum, G. ed.). Berlin: Mouton de Gruyter: 200-326

2004. "Coherent fieldwork". *Linguistics Today* (van Sterkenberg, P. ed.). Amsterdam: John Benjamins

2005."Cultural Constrains on Grammar and Cognition in Pirahã." *Current Anthropology*. 46(4):621-646

2007. "Cultural Constraints on Grammar and Cognition in Pirahã: A Reply to Nevins, Petetsky and Rodrigues". From authors website: https://daneverettbooks.com/

2007a. "Recursion and human thought: Why the Pirahã don't have Numbers". https://www.edge.org/conversation/daniel_l_everett-recursion-and-human-thought

2009. "Pirahã Culture and Grammar: A Response to Some Criticisms". *Language*. 85(2):405-442

Fawcett, Peter. 2008. “Linguistic Approaches”. *Routledge Encyclopedia of Translation Studies* (Baker, M. d.). New York: Routledge

von Fintel, K.-

2000. “What is presupposition accommodation?” http://webcache.googleusercontent.com/search?q=cache:g61ThVhvDQoJ:mit.edu/fintel/fintel-2000-accomm.pdf+&cd=1&hl=en&ct=clnk&gl=us&client=firefox-b-1

2001. “Would you believe it? The king of France is back! Presuppositions and truth value intuitions”. *Descriptions and Beyond* (Bezuidenhou, A.t and Reimer, M. editors). Oxford: Oxford University Press

von Fintel, K. and Matthewson, L. 2008. “Universals in Semantics”. *The Linguistic Review*. 25: 139-201

Fodor, J.-

1975. *The Language of Thought*. New York: Crowell

1983. *Modularity of Mind.* Cambridge, MA: MIT Press

Fodor, J.; Bever, T. and Garett, M. 1974. *The Psychology of Language*. New York: McGraw-Hill

Fortescue, M. 1984. West Greenlandic. Abingdon: Routledge.

Frank, M.; Everett, D.; Fedorenko, E.; Gibson, E. 2008. “Number as cognitive technology: Evidence from Pirahã language and cognition”. *Cognition*. 108: 819-824

Frege, Gottlob-

1892. “On Concept and Object”. *Viertelijahrsschrift fur wissenschaftiliche Philosophie.* 16: 192-205

1893. *Grundgestze der Arithmetik*. Oxford: Oxford University Press

1919. "Thought". *Beiträge sur Philosophie des deutschen Idealismus I*. 58-77

1963. "Compound Thoughts". *Mind*. 72(285): 1-17

Futrell, R.; Stearns, L.; Everett, D.; Piantadosi, S.; Gibson, E. 2016. "A Corpus Investigation of Syntactic Embedding in Pirahã". https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0145289

Gadzar, G. 1979. *Pragmatics: Implicature, presupposition and logical form*. New York: Academic Press

Gauker, C. 1998. "What is a context of utterance?". *Philosophical Studies*. 91:149-172

Gentzen, G. 1933. "On the relation between intuitionist and classical arithmetic". *The collected papers of Gerhard Gentzen* (Szabo M., ed.). Amsterdam: North-Holland

Geurts, B. 2005. "Processing Quantifiers 4: Acquiring Strength". http://ncs.ruhosting.nl/bart/talks/paris2005/parislides4.pdf

Gil, D. 1991. "Aristotle goes to Arizona, and finds a language without *and*." *Semantic Universals and Universal Semantics* (Zaefferer, D. ed.). Berlin: Foris. 96-130

Givón, Talmy. 1978. "Universal Grammar, Lexical Structure and Translatability". *Meaning and Translation* (Guenther and Guenther-Reutter, ed). New York: New York University Press

Glivenko, V. "Sur quelques points de la logique de M. Brouwer". *Bulletin of the Royal Academy of Belgium*. (15): 183-188

Gödel, K.-

1933a. “On intuitionistic arithmetic and number theory”. English translation published in *The Undecidable* (M. Davies. Ed). Newark: Raven Press.

1933b. “Eine Interpretation des Intuitionistischen Aussagenkalküls”. *Ergebnisse eines mathematischen Kolloqui*ms. (4)

Godfrey-Smith, Peter. 2016. *Other Minds*. New York: Farrar, Straus, and Giroux

Goldblatt, R.1984. *Topoi: The Categorial Analysis of Logic*. Minola, NY: Dover

Gordon, P. 2004. “Numerical Cognition Without Words: Evidence from Amazonia”. *Science*. 306(15): 496-499

Greenway, J. 1964. *The Inevitable Americans*. New York: Alfred E. Knopf

Grice, Paul. 1989. “Logic and Conversation”. *Studies in the Way of Words*. Boston: Harvard University Press: 22-40

Hauser, M.; Chomsky, N.; Fitch, T. 2002. “The Faculty of Language: What Is It, Who Has It, and How Did It Evolve.” *Science*. 198: 1569-1579

Haviland, J. 1979. “Guugu Yimidhirr”. *Handbook of Australian Languages* (Dixon, I. and Blake, B. ed.). Canberra: Australian National University Press. 27-182

Hale, K.-

1975. “Gaps in grammar and culture”. Linguistics and Anthropology. (Kinkade, D.; Hale, K.; Werner, O. ed.). Lisse: The Peter de Ridder Press. 295-315

1983. “Warlpiri and the Grammar of Non-Configurational Languages*”. Natural Language & Linguistic Theory*. 1(1): 5-47

Hale, K.; Laughren, M.; Simpson, J. 1995. “Warlpiri”. Syntax. An International Handbook of Contemporary Research (Jacobs, J.; von Stechow, A.; Sternefeld, W.; Vennemann, T. ed.). Berlin. Walter de Gruyter. 1430-1451

Hallowell, A. 1960. “Ojibwa Ontology, Behavior and World View”. *Culture in History: Essays in Honor of Paul Radin* (Diamond, S. ed.). New York: Columbia University press

Hammarström, H. 2010. “Rarities in numeral systems.” *Rethinking Universals: How Rarities Affect Linguistic Theory* (Wohlgemuth, J. and Cysouw, M. ed.). Berlin: Mouton de Gruyter. 11-60

Haspelmath, M. 2012. “How to compare major word-classes across the world’s languages”. *UCLA Working Papers in Linguistics, Theories of Everything*. 17:109-130

Harvey, Keith. 2008. “Compensation”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Hill, K. 2002. “On Publishing the Hopi Dictionary”. *Making dictionaries: Preserving Indigenous Languages of the Americas*. Berkeley: University of California Press

Hinton, L. 1988. “Book Review of Hopi Time by Ekkehart Malotki”. *American Indian Quarterly*. 12(4):361-64

Hjemslev, L. 1943. *Prolegomena to a Theory of Language* (Whitfield, F. ed.). Madison: University of Wisconsin Press

Hockett, C. 1960. “The Origin of Speech”. *Scientific American*. 203:88-111

Hofstadter, D. 1997. *Le ton beau de Marot*. New York: Basic Books

Hopi Dictionary Project. 1998. *Hopi Dictionary: Hopikwa Lavaytuveni*. Tuscon: University of Arizona Press

Horn, L. 1972. *On the Semantic Properties of Logical Operators in English*. Ph.D. dissertation for the University of California, Los Angles

Hornstein, N. and Robinson, J. 2016. "100 Ways to Misrepresent Noam Chomsky". *Current Affairs*. https://www.currentaffairs.org/2016/12/thousand-ways-to-misrepresent-noam-chomsky

Hsiang-Hua, C., Miller, K., Schmitt, C. 2004. "Acquisition of the Strong and Weak Quantifiers in 'There'-Existentials".
file:///C:/Users/CAE52/OneDrive/Desktop/Acquisition_of_the_Strong_and_Weak_ Quantifiers_in_.pdf

Huang, J. and Roberts, I. 2016. "Principles and Parameters of Universal Grammar". *The Oxford Handbook of Universal Grammar* (Roberts, I. ed.). Oxford: Oxford university Press

Huang, N. 2011. "Multiple Modals*". Yale Grammatical Diversity Project: English in North America*. https://ygdp.yale.edu/phenomena/ multiple-modals

Humboldt, William von. 1836*. The Heterogeneity of Language and its Influence on the Intellectual Development of Mankind*. Berlin: F. Dümmler

Immler, M. 1974. *Generative Syntax*. München: Fink

Jacobsen, W. 1983. "Typological and Genetic Notes on Switch-Reference Systems in North American Indian Languages". *Switch Reference and Universal Grammar* (Haiman, J. and Munro, P. eds.). Amsterdam: Benjamins. 151-184

Jakobson, Roman. 1959. "On Linguistic Aspects of Translation". *Selected Writings II: Word and Language*. Paris: Mouton

Jakobson, R. and Halle, M. 1971. *Fundamentals of Language*. The Hague: Mouton

Jelinek, Eloise. 2006. The pronominal argument parameter. *Arguments and Agreement* (Ackama et. al. eds). 261–82. Oxford: Oxford University Press

James, Williams. 1958. *The Varieties of Religious Experience*. New York: New American Library

Jerabek, E. 2012. "The Ubiquity of Conservative Translations." *The Review of Symbolic Logic* 5:666–678.

Kaplan, D. 1977. "Demonstratives". *Themes from Kaplan (*Almong, J. Perry, J., Wettstein, H. eds.). Oxford: Oxford University Press. 481-563)

Kaplan, L. 2003. "Innuit Snow Terms: How Many and What Does it Mean?". *Proceedings of the 2nd IPSSAS Seminar*

Katz, Jerrold-

1972. *Semantic Theory*. New York: Harper and Row

1976. "A hypothesis about the uniqueness of natural language." *Origins and Evolution of Language and Speech* (Steklis, H.; Harnad, S.; Lancaster, J. ed.). New York: New York Academy of Sciences

1977. *Propositional Structure and Illocutionary Force*. Cambridge: Harvard University Press

1978. "Effability and Translation". *Meaning and Translation* (Guenther and Guenther-Reutter, ed.) New York: New York University Press

1981. *Language and Other Abstract Objects*. Totowa, NJ: Rowman and Littlefield

1985. *The Philosophy of Linguistics*. Oxford: Oxford University Press

Katz, J. and Fodor, J. 1963. "The Structure of a Semantic Theory". Language. (39)2: 170-210

Kay, P. and Regier, T. 2006. “Language, thought and color: Recent developments”. *Trends in Cognitive Science*. 10(2): 51-54

Keating, B. 2020. “Noam Chomsky: Is it possible to communicate with extraterrestrials?”. https://www.youtube.com/watch?v=n7mvUw37g-U

Keenan, Edward.-

1972. “On Semantically Based Grammar”. *Linguistic Inquiry*. 3(4): 413-461

1972a. “Relative clause formation in Malagasy and some related and not so related languages”. *The Chicago Which Hunt*. Chicago: Chicago Linguistic Society.

1974. “Logic and Language”. *Language as a Human Problem* (Haugen, E. and Bloomfield, M. editors). New York: W.W. Norton and Company

1975. “Toward a universal definition of “subject of””. *Subject and Topic* (Li, C. editor). New York: Academic Press

1975a. “Remarkable subjects in Malagasy”. *Subject and Topic* (Li, C. editor). New York: Academic Press

1975b. “Logical expressive power and syntactic variation in natural language”. *Formal Semantics of Natural Language*. Cambridge: Cambridge University Press

1976. “The Logical Diversity of Natural Language”. *OrigiMns and Evolution of Language and Speech* (Steklis, H.; Harnad, S.; Lancaster, J. editors). New York: New York Academy of Sciences

1978. “Some Logical Problems in translation”. *Meaning and Translation.* (Guethner-Reutter, M. and Geuthner, F. editors). London: Duckworth

Kemmer, S. 2009. “Edward Sapir’s Language: An Introduction to the Study of Speech”. http://www.ruf.rice.edu/~kemmer/Found/sapiressay.html

Kenny, Dorothy. 2008. “Equivalence”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Knight, C. 2008. “Interview with Noam Chomsky”. Radical Anthropology. (2):19-23

Kocurek, A.-

2017. “On the Concept of a Notational Variant”. 6th International Workshop in Logic, Rationality, and Interaction.

2018. *What Can You Say? Measuring the Expressive Power of Languages.* PhD Dissertation, University of California Berkeley

Kolmogoroff, A. 1925. “On the principle of excluded middle”. *Mathematicèskij Sbornik.* (32): 646-667

Kramer, S. “A remote Amazonian tribe could fundamentally change our understanding of language”. *Business Insider*. https://www.businessinsider.com/brazil-piraha-language-recursion-controversy-linguistics-2016-3

Kratzer, A.-

1981. “The notional category of modality”. *Words, Worlds and Contexts* (Eikmeyer, H. and Rieser, H., ed.). Berlin: Walter de Gruyter. 38-74

1991. “Modality”. *Semantic ein internationals Hanbuch zeitgenössicher*. Berlin: Mouton de Gruyter. 639-650

Kroch, A. 1994. “Morphosyntactic Variation”. *Papers from the 3oth Regional Meeting of the Chicago Linguistics Society*

Kuhn, T. 1962. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press

Lasnik, H. *Syntactic Structures Revisited*. Cambridge, MA: The MIT Press

Leavitt, John. 2011. *Linguistic Relativities: Language Diversity and Modern Thought*. Cambridge: Cambridge University Press

Leibniz, G. 1949. *New Essays Concerning Human Understanding* (Langley, A., tr.). LaSalle IL: Open Court

Levinson, S.-

1983. *Pragmatics*. Cambridge: Cambridge University Press

1996. "Language and Space". *Annual Review of Anthropology*. 25: 353-382

1997. "From outer to inner space: Linguistic categories and non-linguistic thinking". *Language, culture and cognition, Vol.1 Language and Conceptualization* (Nuyts, J. and Pederson, E. eds.). Cambridge: Cambridge University Press. 13-45

2000. "Language as Nature and Language as Art". *Proceedings of the Symposium on Changing concepts of nature and the turn of the Millennium* (Muttelstrass, J. and Singer, W. ed.). Vatican City

2001. "Yèli Dnye and the Theory of Basic Color Terms". *Journal of Linguistic Anthropology*. 10(1):3-55

2003. "Language and Mind: Let's Get the Issues Straight!. *Language in Mind: Advances in the Study of Language and Thought* (Genter, D. and Goldin-Meadow, S. ed.). Cambridge, MA: The MIT Press. 25-46

Levinson, S. and Brown, P. 1993. ""Uphill" and "Downhill" in Tzeltal". *Journal of Linguistic Anthropology*. 3(1): 46-74

Levinson, S., Kita, S., Haun, D., Rasch, B. 2002. “Returning the Tables: language affects spatial reasoning.” *Cognition*. 84:155-188

Lewis, David. 1974. “Radical Interpretation”. *Synthese*. 27 (4): 331-344

Li, P. and Gleitman, L. 2002. “Turning the tables: Language and spatial reasoning”. *Cognition* 83(3): 265–294

Li, Y. and Wei, W. 2019. “Microparameters and Language Variation*”. Glossa: a Journal of General Linguistics*. 4(1): 106

Lindauer, Martin. 1961. *Communication among Social Bees*. Cambridge: Harvard University Press

Lindenfeld, J. 1973. *Yaqui Syntax*. Berkeley: University of California Press

Lobina, D. and Brenchley, M. “Fiat recursion!”. 2020. INFERENCE: International Review of Science. (5):2

Locke, William and Booth, Donald. *Machine Translation of Languages*. New York and London: The Technology Press of the Massachusetts Institute of Technology

Lucy, J. 1997. “Linguistic Relativity”. *Annual Review of Anthropology*. (26): 191-312

Lycan, William. 2000. *Philosophy of Language*. New York: Routledge

Makinson. 2005. *Bridges from Classical to Nonmonotonic Logic*. London: College Publications

Malmkjaer, Kristen.-

2008. “Analytic Philosophy and Translation”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

2008a. “Units of Translation”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Malotki, E.1979. *Hopi Time: A Linguistic Analysis of the Temporal Concepts in the Hopi Language*. Tübingen: Gunter Narr Verlag

Malpas, J.-

1989. "The Intertranslatability of Natural Languages". *Synthese*. 78(3): 233-264

2015. "Donald Davidson". *The Stanford Encyclopedia of Philosophy* (Zalta, E. ed). https://plato.stanford.edu/archives/fall2015/entries/davidson/

Mann, A. 2018. "What Linguistics Can Tell us about Talking to Aliens". *Scientific American* https://www.scientificamerican.com/article/what-linguistics-can-tell-us-about-talking-to-aliens/

Margolis, E. and Laurence, S. 2021. "Concepts". *Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=concepts

Martinich, A.P. and Sosa, David. 1985. *The Philosophy of Language*. Oxford: Oxford University Press

Matthewson, L. –

1998. *Determiner Systems and Quantificational Strategies: Evidence from Salish*. The Hague: Holland Academic Graphics

2004. "Strategies of Quantification: Evidence from the world". Paper presented at the Strategies of Quantification Conference, York, England

2004a. "On the methodology of semantic fieldwork." International Journal of American Linguistics. 70:369-415

2006. "Presuppositions and Cross-Linguistic Variation". *Proceedings of NELS 26.*

2006. Temporal semantics in a supposedly tenseless language. Linguistics and Philosophy. (29): 673-713

2001. “Quantification and the Nature of Crosslinguistic Variation”. *Natural Language Semantics*. Dordrecht: Kluwer Academic Publishers

2010. “Cross-linguistic variation in modality systems: The role of mood”. *Semantics & Pragmatics*. (3)9: 1-74

2013. “Gitksan Modals”. *International Journal of American Linguistics*. 79: 349-394

2013A. “Strategies of Quantification in St’at’imcets and the Rest of the World”. *Strategies of Quantification* (Gil, K.; Harlow, S.; Tsoulas, G. editors). Oxford: Oxford University Press

2013B. “On How (Not) to Uncover Cross-Linguistic Variation”. *Proceedings of the North East Linguistic Society*. 42: 323-342

2014. “The Measurement of Semantic Complexity: How to Get By If Your Language Lacks Generalized Quantifiers”. *Formal Complexity* (Newmeyer, F. and Preston, L. editors). Oxford: Oxford University Press

2016. “Modality”. The Cambridge Handbook of Formal Semantics. (Aloni, M. and Dekker, P. editors). 525-559.

Matthewson, L.; Henry, D.; Rullmann, H. 2007. “Evidentials as epistemic modals: Evidence from St’at’imcets. *Linguistic Variation Yearbook*. 7:201-54

McCowan, B., Doyle, L., and Hanser, S.-

1999. “Quantitative tools for comparing animal communication systems: Information theory applied to bottleneck dolphin whistle repertoire”. *Animal Behavior*. 57: 409-419

2002. “Using Information theory to assess the diversity, complexity and development of communication repertoires”. *Journal of Comparative Psychology*. 116(2): 166-172

McWhorter, John. 2016. “The bonfire of Noam Chomsky: journalist Tom Wolfe targets the acclaimed linguist”. *Vox*. https://www.vox.com/the-big-idea/2016/9/14/12910180/noam-chomsky-tom-wolfe-linguist

Menzies, S. 2013. *Nsyilxcen Modality: Semantic analysis of epistemic modality*. Thesis, University of British Columbia

Minsky, M. 1985. “Communication with Alien Intelligence”. *MIT Media Lab*. https://web.media.mit.edu/~minsky/papers/AlienIntelligence.html

Mithun, M. 1984. “How to avoid subordination”. *Berkeley Linguistic Society* 10: 493-509

Montague, Richard. 1970. “Universal Grammar”. *Theoria*. (36): 373-398

Mossakowski, T; Diaconescu, R; Tarlecki, A. 2009. “What is a logic translation?” *Logica Universalis* 3:95–124.

Mounce, H. 1981. *Wittgenstein’s Tractatus: An Introduction*. Oxford: Blackwell

Menzies, S. 2013. *Nsyilxcen Modality: Semantic analysis of epistemic modality*. Thesis, University of British Columbia

Nevins, A.; Pesetsky, D.; Rodrigues, C-.

2009. “Pirahã Exceptionality: A Reassessment.” *Language*. 85(2):355-404

2009a. “Evidence and argumentation: A reply to Everett (2009)”. *Language*. 85(3):671-681

Neil, M. (dir.) 2019. “The Grammar of Happiness” (film)

Newmeyer, F. 2002. “Uniformitarian assumptions and language evolution research.” *The transition to language* (Wray, A. ed.). Oxford: Oxford University Press. 359-75

Nida, Eugene.-

1969. “Science of Translation”. *Language*. 45:483-498

2008. “Translatability”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Oberhaus, D. 2019. *Extraterrestrial Languages*. Boston: MIT

Palmer, F. 1979. *Modality and the English Modals*. London: Longman

Partee, B. 2008. “Noun Phrases and Generalized Quantifiers”. Lecture Notes, http://people.umass.edu/partee/RGGU_2008/RGGU084_2up.pdf

Pelletier, F; Urquhart, A. 2003. “Synonymous Logics.” *Journal of Philosophical Logic* 32:259–285.

Penn, Julia. 1972. *Linguistic Relativity versus Innate Ideas: The Origins of the Sapir-Whorf Hypothesis in German Thought*. Paris: Mouton.

Perigrin, J. 2008. “What is the Logic of Inference?”. *Studia Logia: An International Journal For Symbolic Logic.* Volume 88. Number 2. Pages 263-95

Pietroski, P.-

2003. “The Character of Natural Language Semantics”. *Epistemology of Language* (Barber, A. ed.). Oxford: Oxford University Press: 217-256

2005. “Meaning before Truth”. *Contextualism in Philosophy: Knowledge, Meaning and Truth*. Oxford: Oxford University Press: 253-300

2018. *Conjoining Meanings: Semantics Without Truth Values*. Oxford: Oxford University Press

Pinker, Steven. 1994. *The Language Instinct*. New York: HarperCollins

Potts, C.-

2002. "The Syntax and Semantics of As-Parentheticals". *Natural Language and Linguistic Theory*. 20: 623-689

2005. "Conventional implicatures, a distinguished class of meanings". *The Oxford Handbook of Linguistic Interfaces* (Ramchand, G. and Reiss, C., eds.). Oxford: Oxford University Press

2007. "The expressive dimension". *Theoretical Linguistics* 33 (2): 165–198

Prawitz, D. and Malmnäs, P. 1968. "A survey of some connections between classical, intuitionistic and minimal logic". *Contributions to Mathematical Logic* (Schmidt, H. et al. Ed.). Amsterdam: North Holland. 215-229

Premack, David. 1971. "Language in Chimpanzees". *Science.* 172(3985)

Progovac, L. 1998. "Determiner phrase in a language without determiners". *Journal of Linguistics*. 34:165-179

Priest, G., Tanaka, K., Weber, Z. 2018. "Paraconsistent Logic". *The Stanford Encyclopedia of Philosophy*. (Zalta, E. ed.). https://plato.stanford.edu/archives/sum2018/entries/logic-paraconsistent/

Pullum, G. 1989. "The great Eskimo vocabulary hoax". *Natural Language and Linguistic Theory*. (7)2: 275-281

Putnam, H. 1973. "Meaning and Reference". *Journal of Philosophy*. 70:699-711

Pym, Anthony and Turk, Horst. 2008. “Translatability”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Quine, W. –

1948. “On What There Is”. *The Review of Metaphysics*. (2)5: 21-38

1956. “Quantifiers and Propositional Attitudes”. *The Journal of Philosophy*. (53)5: 177-197

1960. *Word and Object*. Boston: MIT Press

1970. *Philosophy of Logic*. Cambridge: Harvard University Press

Recanati, F.-

1989. “The pragmatics of what is said”. *Mind and Language*. 4:294-328

2003. “The Limits of Expressibility”. *John Searle* (Smith, B. ed). Cambridge: Cambridge University Press. 189-213

Roberts, J. 1997. “Switch-Reference in Papua New Guinea”. *Papers in Papuan Linguistics* (Pawley, A. ed.). Canberra: The Australian National University Press. 101-241

Robinson, A. 2008. *Lost Languages: The Enigma of the World’s Undeciphered Scripts*. New York: Tess Press

Robinson, D. 2008. “Literal Approaches”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Rullman, H.; Matthewson, L.; Davis, H. 2008. “Modals as distributive indefinites”. *Natural Language Semantics*. 16: 317-57

Russell, B. 1919. “Descriptions”. Introduction to Mathematical Philosophy. London: George Allen and Unwin. 167-180

Sakel, J. 2012.“Acquiring Complexity: The Portuguese of Some Pirahã Men”. Linguistic Discovery. 10(1): 75-88

Sapir, Edward-

1921. *Language*. New York: Harcourt

1924. “The Grammarian and his Language”. American Mercury. 1:149-155

1929. “The Status of Linguistics as Science”. *Language* 5:207-214

1949. *Selected Writings of Edward Sapir*. (Mandelbaum, D. ed.). Berkeley: University of California Press

Sauerland, U.2010. “Experimental Evidence for Complex Syntax in Pirahã”. Unpublished: https://ling.auf.net/lingbuzz/001095

Scholz, Barbara; Pelletier, Francis and Pullum, Geoffrey. 2016. “Philosophy of Linguistics”. *Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/archives/ win2016/ entries/ linguistics/

Searle, John.-

1969. *Speech Acts*. Cambridge: Cambridge University Press

1979. *Expression and Meaning*. Cambridge: Cambridge University Press

Sheldon, S. 1988. “Os sufixos verbais Mura-Pirahã”. *Se´rie Linguı´stica* 9:146–7

Shostak, S.2014. “Talking to Aliens”. *SETI Institute website*. https://www.seti.org/talking-aliens

Slotkin, J. 1956. “The Peyote Way”. *Teachings from the American Earth: Indian Religion and Philosophy* (Tedlock, D. and Tedlock, B. ed.): 96-104

Smith, C. and Erbaugh, M. 2005. “Temporal Interpretation in Mandarin Chinese”. *Linguistics*. 43(4)

Somers, Harold. 2008. “Machine Translation: history”. *Routledge Encyclopedia of Translation Studies* (Baker, M. ed.). New York: Routledge

Speaks, J. 2021. “Theories of Meaning”. *The Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=meaning

Sperber, D. and Wilson, D. 1986. *Relevance: Communication and Cognition*. Oxford: Blackwell

Spode, E. 2016. “Tom Wolfe’s reflections on language”. *3:AM Magazine*. http://www.3ammagazine.com/3am/tom-wolfes-reflections-language/

Steiner, G. 1975. *After Babel*. Oxford: Oxford University Press

Swadesh, M. 1952. “Lexico-statistic dating of prehistoric ethnic contacts: With special reference to north American Indians and Eskimos”. *Proceedings of the American Philosophical Society*. 96(4): 452-463

Szabó, Z. 2020. “Compositionality”. *Stanford Encyclopedia of Philosophy* (Zalta, E. ed.). https://plato.stanford.edu/entries/compositionality/

Tarski, Alfred. –

1944. “The Semantic Conception of Truth and the Foundations of Semantics”. *Philosophy and Phenomenological Research*. 4(3): 341-376

1956. *Logic, Semantics and Metamathematics*. London: Oxford University Press

Tedlock, B. and Tedlock, B. 1975. *Teachings from the American Earth: Indian Religion and Philosophy*. Liveright: New York

Thierry, G.; Athanasopulous, P.; Wiggett, A.; Dering, B; and Kuipers, J. 2009. "Unconscious effects of language-specific terminology on pre-attentive color perception". *Proceedings of the National Academy of Sciences*. 106(11):4567-4570

Tonhauser, J.-

2011. "Temporal Reference in Paraguayan Guaraní, a Tenseless Language". *Linguist and Philos*. 24: 257-303

2015. "Cross-Linguistic Temporal Reference". *Annual Review of Linguistics*. 1: 129-54

Wang, W. and Zhou, W. 2018. "On Relative Translatability of Language with Special Reference to Contrastive Analysis between Chinese and English". Journal of Language Teaching and Research. 9(2):203-308

Waismann, F. 1945. "Verifiability". *Proceedings of the Aristotelian Society*. 19

Whorf, B.-

1936. "The punctual and segmentative aspects of verbs in Hopi". *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press. 51-56

1938. "Some verbal categories of Hopi". *Language*. 14(2):275-286

1939. *"*The relation of habitual behavior and thought to language*". Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press. 134-159

1940. “Linguistic factors in the determination of Hopi architecture”. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press. 199-206

1941. “Language, mind and reality”. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press.445-270

1946. “The Hopi language, Toreva dialect”. Linguistic Structures of Native America (Hoijer, H. ed.). New York: Viking. 158-183

1956. “An American Indian Model of the Universe”. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press. 57-64

1956.a. “Discussion of Hopi Linguistics”. *Language, Thought and Reality: Selected Writings of Benjamin Lee Whorf* (Carrol, J. editor). Cambridge, MA: MIT Press. 102-111

Wierzbicka, A. 1996. *Semantic Primes and Universals*. Oxford: Oxford University Press

Wierzbicka and Goddard.-

1995. “Key Words, Culture and Cognition”. *Philosophica*. (55)1: 37-67

2014. *Words and Meanings: Lexical Semantics Across Domians, Languages and Cultures.* Oxford: Oxford University Press

Wittgenstein, L.-

1921. *Tractatus Logico-Philosophicus*. London: Kegan Paul, Trench, Trubner & Co., LTD

1953. *Philosophical Investigations* (Anscombe, G. trans). Oxford: Blackwell

1965. “A Lecture on Ethics”. *The Philosophical Review*. (74)1: 3-12

Wójcicki, R. 1988. *Theory of Logical Calculi*. Dordrecht: Kluwer

Wolfe, T. 2016. *The Kingdom of Speech*. New York: Little, Brown and Company

Zimmermann, T. 2000. “Free Choice Disjunction and Epistemic Possibility”. *Natural Language Semantics*. (8)4: 255-290

Zipf, G. 1949. *Human Behavior and the Principle of Least Effort*. Cambridge, MA: Addison-Wesley