

September 28, 2011

## Towards a taxonomy of projective content

Judith Tonhauser\*, David Beaver%, Craige Roberts\* and Mandy Simons<sup>#</sup>

\*The Ohio State University, %University of Texas at Austin, <sup>#</sup>Carnegie Mellon University

### Abstract

Projective contents, which include presuppositional inferences and Potts' (2005) conventional implicatures, are meanings which are projected when a construction is embedded, as standardly identified by the 'Family of Sentences' diagnostic (e.g. Chierchia and McConnell-Ginet 1990). This paper establishes distinctions among projective contents on the basis of a series of diagnostics, including a variant of the Family of Sentences diagnostic, that can be applied with linguistically untrained consultants in the field and the laboratory. These diagnostics are intended to serve as part of a toolkit for exploring projective contents across languages, thus allowing the validity of generalizations to be examined cross-linguistically. We apply the diagnostics in two languages, focussing on Paraguayan Guaraní (Tupí-Guaraní), and comparing the results to those for English. Our study of Paraguayan Guaraní is the first systematic exploration of projective content in a language other than English. Based on the application of our diagnostics to a wide range of constructions, four meaningful subclasses of projective contents emerge. The resulting taxonomy of projective content has strong implications for contemporary theories of projection (e.g. Karttunen 1974; Heim 1983; van der Sandt 1992; Potts 2005; Schlenker 2009), which were developed for the projective properties of subclasses and fail to generalize to the full set of projective contents.

### Contact information:

Judith Tonhauser (corresponding author)

222 Oxley Hall, 1712 Neil Ave Columbus, OH 43210

judith@ling.osu.edu

David Beaver

Calhoun Hall 414, 1 University Station B5100, Austin, TX 78712

dib@mail.utexas.edu

Craige Roberts

222 Oxley Hall, 1712 Neil Ave Columbus, OH 43210

croberts@ling.osu.edu

Mandy Simons

Baker Hall 135, Carnegie Mellon University, Pittsburgh, PA 15213

simons@andrew.cmu.edu

### Acknowledgments:

For helpful feedback and discussions, we thank Maria Bittner, Chris Barker, Lucas Champollion, Kai von Fintel, Lisa Matthewson and E. Allyn Smith, as well as the participants of the three workshops on *Projection, Entailment, Presupposition and Assertion* (PEPA) in Columbus, Ohio, 2009, Vancouver, Canada, 2010, and Rutgers, New Jersey, 2011, the participants of the 2011 *ESSLLI* course on projective content, and the audiences at a colloquium at the University of Tübingen in June 2011, at the 2011 meeting of the *Linguistic Society of America* and at *Semantics of Under-represented Languages of the Americas* (*SULA*) 6. We also thank our Paraguayan Guaraní language consultants for working with us, especially Marité Maldonado, Evert Ojeda Morán, and Julio Rolon. This project is financially supported by a collaborative research grant from the National Science Foundation to David Beaver, Craige Roberts, Mandy Simons and Judith Tonhauser ('Collaborative Research: Semantics and Pragmatics of Projective Meaning across Languages'; grants #0952571 (OSU), #0952497 (CMU), #0952862 (UT Austin); 2010-12).

## Towards a taxonomy of projective content

### Abstract

Projective contents, which include presuppositional inferences and Potts' (2005) conventional implicatures, are meanings which are projected when a construction is embedded, as standardly identified by the ‘Family of Sentences’ diagnostic (e.g. Chierchia and McConnell-Ginet 1990). This paper establishes distinctions among projective contents on the basis of a series of diagnostics, including a variant of the Family of Sentences diagnostic, that can be applied with linguistically untrained consultants in the field and the laboratory. These diagnostics are intended to serve as part of a toolkit for exploring projective contents across languages, thus allowing the validity of generalizations to be examined cross-linguistically. We apply the diagnostics in two languages, focussing on Paraguayan Guarani (Tupí-Guaraní), and comparing the results to those for English. Our study of Paraguayan Guarani is the first systematic exploration of projective content in a language other than English. Based on the application of our diagnostics to a wide range of constructions, four meaningful subclasses of projective contents emerge. The resulting taxonomy of projective content has strong implications for contemporary theories of projection (e.g. Karttunen 1974; Heim 1983; van der Sandt 1992; Potts 2005; Schlenker 2009), which were developed for the projective properties of subclasses and fail to generalize to the full set of projective contents.

### 1 Introduction: Projective contents as a domain for cross-linguistic study

The goal of this paper is to establish distinctions among a range of inferential phenomena which have in common the property of ‘projection’, the term being due to Langendoen and Savin (1971). Projection concerns implications associated with particular constructions, so-called ‘triggers’. What is notable about these implications is that they tend to survive – that is, they tend to be understood as commitments of the speaker – even when the trigger is deeply embedded under other operators.<sup>1</sup> Projection is typically diagnosed using the ‘Family of Sentences’ diagnostic (Chierchia and McConnell-Ginet 1990:29f.), illustrated with the examples in (1).

- (1) Chierchia and McConnell-Ginet (1990:28)
  - a. The present queen of France lives in Ithaca.
  - b. It is not the case that the present queen of France lives in Ithaca.
  - c. Does the present queen of France live in Ithaca?
  - d. If the present queen of France lives in Ithaca, she has probably met Nelly.

In this illustration, we observe the behavior of the implication that there is a unique queen of France, which is triggered by the use of the definite *the present queen of France*. An utterance of sentence (1a) entails both that there is a unique queen of France and that she lives in Ithaca. Utterances of the sentences (1b–d) do not imply that anyone lives in Ithaca, but do still, under normal circumstances, commit the speaker to the claim that France has a unique queen. We call this behavior of the existence implication *projection* and call this implication a *projective content*: an element of content which has the potential to project.

The range of constructions associated with inferences that exhibit projective behavior is huge. It includes all inferences standardly analyzed as presuppositions or as conventional implicatures (and this whether the

---

<sup>1</sup>Projective contents are understood as commitments of the speaker only if they project *globally*. For simplicity, we set aside cases of intermediate projection, not relevant to our purposes here.

term is used in the sense of Grice 1975 or that of Potts 2005). We argue in this paper that projective content should be divided into four subclasses, three of which echo commonly made distinctions, and yet subtly cross-cut them, and one of which is, we believe, a previously unrecognized class of projective contents.

These subclasses, summarized in Table 1, are distinguished by two properties that a projective implication may have: (i) being subject to a ‘Contextual Felicity’ constraint, and (ii) giving rise to a ‘Local Effect’. The term ‘Contextual Felicity’ constraint refers to a particular condition on the felicitous use of a trigger, namely, that it can be used felicitously only if some implication associated with the trigger is established in the context of use. This property is discussed in detail in section 3. ‘Local Effect’ refers to the way in which a triggered implication interacts with operators: Some part of the content of a clause embedded under an operator is said to have a Local Effect just in case it contributes to the content which serves as the operator’s semantic scope. For detailed discussion of this property, see section 5.

Classes	Properties of contents		
	Projection	Contextual Felicity	Local Effect
A.	yes	yes	yes
B.	yes	no	no
C.	yes	no	yes
D.	yes	yes	no

Table 1: Four classes of projective content in English and Paraguayan Guaraní

As seen in Table 1, projective contents in class A are associated with a Contextual Felicity constraint and have a Local Effect, class B projective contents are not associated with a Contextual Felicity constraint and do not have a Local Effect, class C projective contents are not associated with a Contextual Felicity constraint but have a Local Effect, and class D projective contents are associated with a Contextual Felicity constraint but do not have Local Effect. Broadly speaking, class A and D involve certain implications of anaphoric and indexical triggers, class B involves Potts’ (2005) conventional implicatures, but also some contents associated with indexical and anaphoric expressions, and class C includes a mixture of cases standardly described as presuppositions along with inferences whose analysis is more controversial, such as those associated with approximatives (e.g. *almost*) and exclusives (e.g. *only*).

Early observations about projection identified it as a property of presuppositional content, and projection has subsequently been studied entirely from this perspective. In more recent work, however, the close identification of presupposition with projection has been undermined. Chierchia and McConnell-Ginet (1990:351) observe that the content of English non-restrictive relative clauses projects, but hesitate to call this content presuppositional because it does not seem to be subject to any requirement to be background for the addressee. Beaver (2001) comes to similar conclusions regarding English parentheticals. And Potts (2005) takes robust projection behavior to be a core property of the components of meaning he classes as conventional implicatures (including inferences triggered by parentheticals, expressives, and honorifics), while at the same time arguing that conventional implicatures are not presuppositions. These observations constitute a serious challenge to most existing accounts of projection such as Heim (1983), van der Sandt (1992), Schlenker (2007), as these are all predicated on the assumption that projection is a consequence of the presuppositional status of the relevant implication. (See section 8 and Simons et al. 2010 for further discussion.)

The fact that all the inference types discussed in detail in this paper share the property of projectivity provides a rather obvious motivation for studying them together.<sup>2</sup> The strategy that we have chosen for the

<sup>2</sup>Projectivity is almost certainly not the only property that these inferences share. Based on work on English (The Authors 2010), we have found what we take to be compelling evidence of a relationship between projection and ‘at-issueness’, with Jayez (2009) and First.Author (ms.c) providing cross-linguistic support from French and Paraguayan Guaraní (Tupí-Guaraní), respectively.

study of this class of meanings – a strategy whose utility is demonstrated by the results reported in this paper – involves careful investigation of the linguistic behavior of a wide range of triggers of projective meaning. A theoretical account is, after all, unlikely to be successful unless it is founded on a robust grasp of the phenomenon to be explained. We suggest that in order to achieve an adequately robust understanding, we need to examine projection not only in English (as has typically been the case),<sup>3</sup> but in other languages too. And we need reliable data based not only on the judgments of theoreticians, but also on the linguistic judgments of theoretically untrained native speaker consultants.

These desiderata raise some interesting challenges at the interface of theory and methodology. Theoreticians tend to take a “we know it when we see it” approach to projection. But if projection is to be diagnosed by judgments rendered by consultants in the field or by subjects in the lab, we need to determine exactly which judgments are relevant, and we need a strategy to elicit these judgments reliably. Similar issues arise for the identification of the Contextual Felicity constraint and Local Effect, which distinguish among subclasses of projective contents.

One goal of this paper, therefore, is to put the study of projection on a sounder empirical footing. We propose here an extension of the standard empirical paradigm of constructed examples which is appropriate for cross-linguistic work with consultants who have no specific training in linguistics. To be clear, we do not wish to make any deep philosophical point about what constitutes sound methodology. Or perhaps it would be more apropos to say that to the extent that we will make a methodological point, we will make it primarily by doing rather than saying. Thus the bulk of this paper will be taken up not with meta-discussion about the nature of data collection, but with description and explanation of the development and application of specific diagnostic methods that we have applied in two typologically unrelated languages, English and Paraguayan Guarani (Tupí-Guarani).

The significance of providing a cross-linguistic foundation for empirical work on presupposition, and projective contents more generally, is highlighted by recent work of Matthewson (2006). On the basis of fieldwork on St'át'imcets, she draws the striking conclusion that St'át'imcets presuppositions do not impose a constraint on the common ground, and are informative. She makes the assumption that presuppositions in English involve common ground constraints (Stalnaker 1973, 1974), and hence concludes that there is a significant difference between presuppositionality in English and in St'át'imcets. She arrives at this result by applying the “Hey, wait a minute!” (HWAM) test, which assumes that consultants will respond with utterances like “Hey, wait a minute!” to utterances containing presupposition triggers in contexts where the presupposition is not entailed by the common ground. The assumption is that if consultants respond with e.g. “Hey, wait a minute!”, the utterance so responded to has a presupposition failure and, hence, contains a presupposition trigger.

While it would be worthwhile to build directly on Matthewson's work, the HWAM test is not one of the diagnostics that we have yet been able to confidently apply in our own fieldwork, and will thus not be utilized in this paper.<sup>4</sup> Nonetheless, we think it important to point out that the results we will report on, while revealing subtle differences between English and Paraguayan Guarani (henceforth Guarani), go broadly in the opposite direction from Matthewson's. In terms of the metrics we use, our results indicate that the two languages we studied are broadly similar, thus suggesting that the properties we study may reflect quite general cross-linguistic principles. So, broadly speaking, while Matthewson argued against strong presuppositional universals, the data we present suggests that there may be quite strong universals operating not only among standard presuppositions, but beyond.

The paper proceeds as follows. Section 2 provides some background on the development of the diagnostics used in this paper and introduces the triggers of projective content of Guarani explored in this paper.

---

<sup>3</sup>Some research has been carried out on the related topic of presupposition in languages other than English, for example, Levinson and Annamalai (1992) on Tamil and Matthewson (2006) on St'át'imcets (Salish).

<sup>4</sup>We note that consultants could respond with “Hey, wait a minute!” to an utterance for a number of reasons, e.g. to challenge an implicature of the utterance or to indicate some other pragmatic oddity of the utterance besides presupposition failure.

Sections 3 to 5 illustrate diagnostics for exploring Contextual Felicity, Projection and Local Effect in the field, respectively; we motivate in section 4 why diagnosing Contextual Felicity prior to Projection is necessary. The class D of projective contents is separately diagnosed and discussed in section 6 for reasons addressed there. In section 7, we present a summary of the empirical findings in an expanded version of Table 1 and characterize the classes A, B, C and D of projective content and their relationship to previously characterized meaning types, such as classical presuppositions and Potts' conventional implicatures. As discussed in section 8, the taxonomy of projective content that empirically emerges in the two languages has strong implications for contemporary theories of projection (e.g. Karttunen 1974; Heim 1983; van der Sandt 1992; Potts 2005; Schlenker 2009), which were developed for the projective properties of subclasses, and which fail to generalize to the full set of projective contents.

In this paper, we thus hope to make contributions on several fronts. First, the work is relevant to researchers in formal semantics and pragmatics for its arguments that projective content is heterogeneous in ways not currently appreciated, ways which have important consequences for theories of projection. Second, the diagnostics, and the methodology which underlies them, may be of interest to fieldworkers and to anyone interested in collection of data from non-linguist language consultants, in the field or in the lab. Finally, the paper makes a modest contribution to semantic typology, containing the first analysis of a wide range of projective contents in a non-European language.

## 2 Paraguayan Guarani triggers and criteria for diagnostics

The choice of English and of Guarani for the detailed study of projection is not motivated by any special properties of the languages. English is the native language of three of the four authors and has been the focus of the vast majority of work to date on presupposition and projection. The first author of the paper has extensive (though non-native) knowledge of Guarani and experience conducting fieldwork in this language: in general, exploring meaning in collaboration with linguistically untrained native speaker consultants requires that the fieldworker have knowledge of a wide range of grammatical structures of the language, including phonological, morphological, syntactic and pragmatic factors that affect whether an expression is grammatical and felicitous in a particular context (see also Matthewson 2004:370). The utterances to be judged must be grammatical since otherwise a consultant might reject the utterance in a context not because it is false or infelicitous but simply because it is ungrammatical (Matthewson 2004:386,401). And to be judged true or felicitous, utterances must be presented in discourse contexts that appropriately control for the relevant contextual factors.

Guarani is unusual among South American indigenous languages, not just because it is widely spoken (by about four million people in Paraguay and surrounding countries), but also because it is fairly well-documented. In addition to reference works (Gregores and Suárez 1967; Velázquez-Castillo 2004a), there are papers and books on the phonetics and phonology of the language (e.g. Lunt 1973; Rivas 1974; Ade-laar 1994; Walker 1999), its morpho-syntax (e.g. Velázquez-Castillo 1996, 1999, 2002a,b, 2004b; Nordhoff 2004), word order and object marking (e.g. Velázquez-Castillo 1995; Tonhauser and Colijn 2010; Shain and Tonhauser 2010), its prosody (Clopper and Tonhauser 2011, ms), as well as its temporal, aspectual and modal system (e.g. Dessaint 1996; Liuzzi 1987; Liuzzi and Kirtchuk 1989; Tonhauser 2006, 2007, 2009, 2010 to appear a, to appear b). Exploring projective contents in Guarani in collaboration with native speaker consultants is greatly facilitated by this wealth of information already available on the language.<sup>5</sup>

Our goal in developing the diagnostics used here was not to devise methods specifically for the study of Guarani, or of English, but to develop a toolkit that can be adapted for use with different languages and also in different settings (e.g. in fieldwork with individual consultants and also in more conventional experimental settings). This required the diagnostics to be formulated as independently as possible from

---

<sup>5</sup>The Guarani data presented here were collected by the first author during yearly fieldwork trips to Paraguay in 2009 to 2011.

any language-particular lexical inventory or (morpho-)syntactic constructions, so as to be applicable in a typologically diverse range of languages and to thus facilitate cross-linguistic comparison of projective contents. A diagnostic that would fail in this respect is one that, for example, requires forming sentences with negated auxiliary verbs: since many languages, including Guaraní, don't have such verbs, such a diagnostic would not be cross-linguistically applicable. In combination with this flexibility, however, we have attempted to present the diagnostics in adequate detail so as to make it possible to derive comparable cross-linguistic results.

A second critical desideratum for the diagnostics was that they should rely only on judgments by linguistically untrained native speaker consultants that can be reliably obtained, i.e. consultants should understand the task the diagnostic asks them to perform and the task should be natural.

Third, in keeping with standard practice in experimental design, the diagnostics should be formulated in such a way that they do not bias consultants towards a particular answer. The types of judgments mainly used in eliciting the data presented in this paper are briefly discussed in the following.

The diagnostic for Contextual Felicity developed in section 3 relies on judgments of felicity. Such judgments, like judgments of truth, can only be made for utterances presented in a context.<sup>6</sup> To identify the constraints an expression may place on context, an utterance containing the relevant expression is presented to consultants in contexts in which the utterance is expected to be acceptable and in contexts in which it is not expected to be acceptable. Systematically varying a context provides evidence for the kinds of Contextual Felicity constraints the expression is associated with: "...the very fact that a particular sentence can or cannot be used in an out-of-the-blue context (and therefore does not or does have certain felicity conditions) is itself data" (Matthewson 2004:390f).

The diagnostic for Projection developed in section 4 relies on felicity judgments and also on what we call 'implication judgments'. That is, the diagnostic involves asking a consultant whether a given utterance in a particular context gives rise to a target implication. Note that the term 'implication' is neutral between assertion, entailment, conversational implicature, and so on. It is a task for the linguist to determine the proper analysis of a given implication. However, we take it that the identification of the presence of an implication is a basic data point with respect to which speakers can be expected to have judgments. Indeed, such judgments have already been successfully used in experimental research on scalar implicatures (e.g. Geurts et al. 2010) and presuppositions (e.g. Schwarz 2007; Beaver and Clark 2008; Chemla 2009), where a common paradigm is to ask (linguistically untrained) participants to assess whether an utterance has a particular implication or which of a given set of implications an utterance has. In contrast, Matthewson (2004) argues that semantic/pragmatic fieldwork should be limited to consultants' judgments of grammaticality, truth and felicity. We suggest that the diagnostics developed below offer a reliable strategy for eliciting information about implications drawn by interpreters.

In addition to direct elicitation of implication judgments, the diagnostics proposed make use of what we call 'implicit implication judgments', where consultants are asked to answer a question, the answer to which allows the fieldworker to determine whether the target implication arises from the utterance or not. Particularly useful are contexts where implicit implication judgments are based on the goals or desires of a rational agent. To illustrate, consider the example in (2): the context of this example presents Maria as having a particular goal, namely to interview people who had a near-death experience. Rather than asking a consultant whether (2) means that Raul came close to dying, a consultant is asked whether Maria would interview Raul, given Paula's utterance.

---

<sup>6</sup>The context is taken here to be a body of information held in common by the interlocutors in the discourse, including information from the utterance situation, the linguistic context in which the utterance was made, as well as the information structure of the discourse that includes the utterance (e.g. Roberts 2004:197f.). In the first author's fieldwork on Guaraní, contexts are presented verbally either in Guaraní or in Spanish (see Matthewson 2004 for the appropriateness of using a meta-language to present contexts, but see Tonhauser to appear b).

- (2) (*Context*) Maria wants to interview people who had a near-death experience. Paula tells her about her neighbor Raul:<sup>7</sup>

Raul **aimete** o-mano.  
Raul almost A3-die

‘Raul almost died.’

If a consultant affirms that, yes, Maria would want to interview Raul, this can be taken as evidence that (2) conveys that Raul came close to dying and thus as evidence for the hypothesis that the adverb *aimete* ‘almost’ contributes an proximal implication in this particular utterance.

In the diagnostic for Local Effect in section 5, we make use of judgments of truth, where consultants are asked to judge whether a particular utterance is true in a particular context. The diagnostic for Local Effect developed in that section asks consultants to judge the acceptability of complex utterances such as (3), i.e. whether it is possible for the second conjunct to be true in the context of the first. ((3) is judged to be unacceptable.)

- (3) #Andres o-mano kuehe ha Andres o-sená-ta che-ndive ko pyharé-pe.  
Andres A3-die yesterday and Andres A3-have.dinner-PROSP pron.S.1sg-with this night-at  
#‘Andres died yesterday and Andres is going to have dinner with me tonight.’

Having laid out the basics of our methodology, we turn now to an overview of the Guaraní expressions which are investigated in this paper. These are primarily translations of expressions in English which trigger projective contents. Possible translations were straightforwardly identified by elicitation and using dictionaries, except in the case of the change of state verb *stop*: translations of English utterances like *Juan stopped smoking* first resulted in Guaraní translations with the verb (*o*)*heja* ‘leave’ and the nominalized argument *la jepita* ‘the smoke’, as in (4a). While this construction triggers projective content, it did not turn out to be productive, as it was not used to express changes of state with other predicates. It was thus replaced in subsequent fieldwork with the construction *n(d)(a)-...-vé-i-ma* (NEG-...-more-NEG-PERFECT) ‘not anymore’: like its English translation, the utterance in (4b) implies that Juan used to smoke in the past (the ‘pre-state’ implication) but has ceased to smoke (as shown in sections 3 and 4).

- (4) a. Juan o-heja la jepita.  
Juan A3-leave the smoke  
‘Juan stopped smoking.’ (Lit.: John left the smoke.)
- b. Juan **nd-o-pita-vé-i-ma**.  
Juan NEG-A3-smoke-more-NEG-PERFECT  
‘Juan does not smoke anymore.’

---

<sup>7</sup>The Guaraní examples in this paper are given in the standardized orthography of the language used in Paraguay (Ministerio de Educación y Cultura 2004, Velázquez-Castillo 2004a:1421f.), except that all postpositions are attached to their host. Following this orthography, accents are not written for normally accented words (stress on the final syllable); stressed nasal syllables are marked with a tilde. The set A cross-reference prefixes (which mark transitive subjects and some intransitive subjects) are *a(i)*– ‘A1sg’, *ja(i)*– ‘A1pl.incl’, *ro(i)*– ‘A1pl.excl’, *re(i)*– ‘A2sg’, *pe(i)*– ‘A2pl’, and *o(i)*– ‘A3’; the set B prefixes (which mark some intransitive subjects and possessors) are *che(r)*– ‘B1sg’, *ñande(r)*– ‘B1pl.incl’, *ore(r)*– ‘B1pl.excl’, *nde(r)*– ‘B2sg’, *pende(r)*– ‘B2pl’, and *i(ñ)-h-*– ‘B3’. The two portmanteaux prefixes *ro(i)*– ‘12sg’ and *po(i)*– ‘12pl’ refer to a first person subject and a second person (singular/plural) object. The following glosses are used: **ABL** = ablative, **CAUS** = causative, **COMPLETE** = completive aspect, **CONTRAST** = contrastive topic, **DIM** = diminutive, **EXCL** = exclusive, **INCL** = inclusive, **JE** = middle/passive, **MIGHT** = possibility modal, **MUST** = necessity modal, **NEG** = negation, **NOM** = nominalization, **PART** = particle, **PERFECT** = perfect aspect, **PURP** = purpose, **TERM** = terminative aspect, **pron.O/S** = object/subject pronoun, **PROSP** = prospective aspect/modal, **QU** = question, **RC** = relative clause.

In addition to the projective content of the change of state expression *n(d)(a)–...–vé-i-ma* ‘not anymore’ introduced in (4b), sections 3 to 5 explore properties of the projective contents of the Guaraní expressions illustrated in the examples in (5) to (10) below. We focus here on presenting the relevant expressions and their implications, and the discussions in the next sections support the claim that the Guaraní expressions have implications comparable to their English translations. In line with the empirical, theory-neutral approach taken in this paper, all implications of the relevant Guaraní expressions are characterized as propositions (as opposed to characterizing some as constraints on context).

The verb (*oi*)*kuaa* ‘know’ embeds a sentential complement (which is marked on the embedded verb by the nominalizing suffix *-ha* ‘NOM’). We explore the properties of the content of the complement clause.

- (5) (*Context*) A family receives a young man who has returned to their town after many years away.

Roi-**kuaa** niko re-ju-ha-gue.  
A1pl.excl-know PART A2sg-come-NOM-NOM.TERM

‘We knew that you had come.’ (from a theater play)

The naturally occurring examples in (6) feature the adverb *avei* ‘too’, the adverb *aimete* ‘almost’ and the suffix *-nte* ‘only’, respectively. The adverb *avei* ‘too’ occurs in (6a) after the noun phrase *vúrro tuja havē* ‘very old donkey’. With *avei* ‘too’, we explore the properties of the implication that there is an alternative true proposition<sup>8</sup> (the ‘existence’ implication), i.e. the implication that there is another individual satisfying the relevant predication: in (6a), this is the implication that there is another individual running down the path. We also explore the properties of the implication that this alternative proposition is salient (the ‘salience’ implication). In the context of (6a), the contextually salient alternative true proposition is that expressed by the first conjunct, namely that the jaguar ran down the path. The adverb *aimete* ‘almost’ in (6b) conveys that the brother came close to falling onto the spines of the coconut plant (the ‘proximal’ implication), but ultimately didn’t (the ‘polar’ implication, which we take to be projective, but see e.g. Horn 2002). And the suffix *-nte* ‘only’ in (6c) conveys that the head of the monkey stuck out of the hole in the tree (the ‘prejacent’ implication) and that it was the only body part that stuck out (the ‘exclusive’ implication — see also Horn 1996; Roberts 2006; Beaver and Clark 2008 on English *only*).

- (6) a. (*Context*) A jaguar and a donkey got into a fight. The donkey hit the jaguar and then:
- Jaguarete o-ñani tapé-re ha vúrro tuja havē **avei** upe tapé-re.  
jaguar A3-run path-on and donkey old moldy too that path-on  
‘The jaguar ran down a path and the very old donkey, too, ran down that path.’ (Krivoshein de Canese et al. 2005:73)
- b. (*Context*) As children, Maria and her brother once had to cross a field with two bulls on it.
- Ha kyhyje-pó-pe ro-hasá ha che-kyvy **aimete** ho'a mbokaja ratí-'ári.  
and scared-hand-in A1pl.excl-pass and B1sg-brother almost A3.fall coco thorn-on  
‘And we passed fearfully and my brother almost fell into the spines of a coconut plant.’
- c. (*Context*) A monkey looked for a place to stay dry in the rain.
- O-ho oi-ko ha'e yvyra kuá-pe, iñ-akā-ngue-mí-**nte** o-nohē o-kē-me.  
A3-go A3-enter pron.S.3 tree hole-in B3-head-NOM.TERM-DIM-only A3-come.out door-in  
‘He entered into the hole of a tree, only his little head stuck out.’ (Acosta Alcaraz and Zarratea 2003:23)

<sup>8</sup>We note that the alternative proposition is not always required to be true in the global utterance context although this is the case in the examples we consider in this paper. The set of relevant alternative propositions is constrained by the syntactic position of *avei* ‘too’ as well as the prosody of the utterance in which it occurs.

Projective contents of possessive and demonstrative noun phrases are also explored in this paper.<sup>9</sup> The example in (7a), repeated from (6b), features the possessive noun phrase *che-kyvy* (B1sg-brother) ‘my brother’, which implies that the speaker has a brother (the ‘possession’ implication; a potential uniqueness implication is not explored here). Demonstrative noun phrases are formed with the demonstrative determiners *ko* ‘near the speaker’, *pe* ‘near the addressee’ or *upé/amō* ‘away from both the speaker and addressee’ (Gregores and Suárez 1967:141); only the former two, illustrated in (7b) and (7c), respectively, are explored in this paper. Two implications of demonstrative noun phrases are explored: that the speaker indicates a suitable entity (the ‘indication’ implication, e.g. that the writer of (7c) indicates the entity referred to with *pe jagua* ‘that dog’)<sup>10</sup> and the implication that the demonstratum has the property denoted by the noun (the ‘descriptive content’ implication, e.g. that the demonstratum of the demonstrative noun phrase in (7c) is a dog); cf. Heim’s (1982) descriptive content implication.

- (7) a. (*Context*) As children, Maria and her brother once had to cross a field with two bulls on it.

Ha kyhyje-pó-pe ro-hasā ha **che-kyvy** aimete ho'a mbokaja ratí-'ári.  
and scared-hand-in A1pl.excl-pass and B1sg-brother almost A3.fall coco thorn-on  
'And we passed fearfully and my brother almost fell into the spines of a coconut plant.'

- b. (*Context*) A young girl was transformed into a bird.

Upe pyhare-guive o-je-hecha **ko guyra pyahu** o-mimbi-pá-va jeguá-gui.  
that night-since A3-JE-see this bird new A3-shine-COMPLETE-RC jewelry-ABL  
'Since that night, one has seen this new bird that shines with beauty.' (Acosta and de Canese 2003:94)

- c. (*Context*) A cricket is interrupting a man’s picnic.

O-henói hymba jagua peteĩ-me ha **pe jagua** o-ñepyrū tuicha o-ñaro.  
A3-call B3.domesticated.animal dog one-at and that dog A3-begin big A3-bark  
'He called one of his dogs and that dog began barking loudly.'

The Guaraní subject pronoun *ha'e* refers to third persons, to the exclusion of animals and inanimate entities: in (8), for example, it refers to the grandmother. The two implications of *ha'e* explored here are that there is a referent (the ‘existence’ implication) and that the referent is human (the ‘human’ implication).<sup>11</sup>

- (8) (*Context*) A woman tells that, as a child, she lived with her grandmother.

**Ha'e** o-pu'ã voi-éterei o-ñami-ha-guã i-vaka.  
pron.S.3 A3-get.up early-very A3-milk-NOM-PURP B3-cow

'She had to get up very early to milk her cows.'

While the above expressions frequently occur in the corpora available to the first author and in her fieldwork notes, expressives, appositives and non-restrictive relative clauses (NRRCs) did not, but were easily obtained in elicitation sessions. The implication that the descriptive content holds of the relevant referent was explored for the two expressives given in (9): since both convey a very negative attitude of the speaker towards the referent of the noun phrase in which they occur, both *mbóre* and *aña memby* (lit. devil

<sup>9</sup>Guaraní does not have a definite determiner; determinerless noun phrases like *jagua* ‘dog’ can receive definite and indefinite interpretations (Tonhauser and Colijn 2010).

<sup>10</sup>The relevant notion of indication can only be made precise given a theory of context and discourse referents; we make do here with this informal characterization.

<sup>11</sup>Like *avei* ‘too’, demonstrative noun phrases and pronouns can be assumed to give rise to salience implications, i.e. that the relevant referents are salient. The salience implications of these expressions are not explored here, but we return to salience implications of other expressions in section 6.

child) are translated here with the English expressive *bastard* (Potts 2005). For appositives and NRRCs, the relevant content likewise is that their contents apply to the relevant referents: The appositive in (10a) conveys that Maria is one of the speaker's friends and the NRRC in (10b), which is marked with the relative clause marker *-va'e* on the verb, that Maria was born in Germany.

- (9) (*Context*) Sabina runs into the house, breathlessly, and says:
  - a. Pe Márko **mbóre** o-monda che-kabayu!  
that Marko bastard A3-steal B1sg-horse  
'That bastard Marko stole my horse!'
  - b. María o-menda pe **aña memby** Ríchard-re!  
Maria A3-marry that devil child Richard-at  
'Maria married that bastard Richard!'
- (10) a. María, **che-angiru peteī**, o-vá-ta Paraguáy-pe.  
Maria B1sg-friend one A3-move-PROSP Asunción-to  
'Maria, one of my friends, is going to move to Asunción.'
- b. María, **o-nasē-va'e-kue** **Alemánia-pe**, oi-ko Brasil-pe.  
Maria A3-born-RC-NOM.TERM Germany-in A3-live Brasil-in  
'Maria, who was born in Germany, lives in Brasil.'

The implications of the expressions mentioned above were tested for their behavior with respect to the Contextual Felicity constraint, Projection and Local Effect. The relevant diagnostics and the results of their application are discussed in turn in the following three sections.

### 3 Contextual felicity

As noted in the introduction, presuppositions are thought of as the paradigm case of projective contents; and presupposition triggers are standardly thought to impose constraints on the conversational context in which they are used. Specifically, it is standardly claimed that utterance of a sentence with presupposition  $p$  is felicitous only if  $p$  is entailed by the context. However, when we explore the full range of projective contents, it becomes clear that many such contents are not straightforwardly subject to this constraint, including many which are standardly analyzed as presuppositions. Our first diagnostic provides a method for diagnosing the presence of this constraint, which we call the Contextual Felicity constraint.

We begin with a definition of the property under investigation. Since a particular trigger may contribute more than one projective content, but not all such contents need be associated with a Contextual Felicity constraint, the property is formulated as a property of a trigger with respect to a particular implication. The definition in (12) makes reference to  $m$ -neutral contexts, defined in (11).<sup>12</sup>

- (11)  **$m$ -positive and  $m$ -neutral contexts**  
An  $m$ -positive context is a context which entails  $m$ . An  $m$ -neutral context is a context that entails neither  $m$  nor  $\neg m$ .
- (12) **Contextual Felicity constraint**  
If utterance of trigger  $t$  of projective content  $m$  is felicitous only in an  $m$ -positive context, then  $t$  imposes a Contextual Felicity constraint with respect to  $m$ .

---

<sup>12</sup>As noted in section 2, we characterize projective contents as propositions rather than constraints on context, and the characterization of  $m$ -positive and  $m$ -neutral contexts in (11) is congruent with this view (e.g. Stalnaker 1973, 1974; Karttunen 1974; Lewis 1979; Heim 1983). If projective contents associated with a Contextual Felicity constraint were instead characterized as constraints, (11) would define an  $m$ -positive context as one in which the constraint  $m$  is satisfied (see e.g. van der Sandt 1992; Geurts 1999). While we use the previous formulation, our findings could be formulated under either characterization.

If a trigger of projective content  $m$  is acceptable in an  $m$ -neutral context, this shows that the trigger is not subject to a Contextual Felicity constraint with respect to  $m$ . This is captured by the subdiagnostic I. for Contextual Felicity in (13a). A judgment of unacceptability in such a context, however, is not sufficient to diagnose the presence of a Contextual Felicity constraint with respect to  $m$ . To diagnose this, the same utterance should also be tested in a minimally different  $m$ -positive context, as per subdiagnostic II. in (13b).

### (13) Diagnostic for Contextual Felicity

Let  $S$  be an atomic sentence that contains trigger  $t$  of projective content  $m$ .

- I. If uttering  $S$  is acceptable in an  $m$ -neutral context, trigger  $t$  does not impose a Contextual Felicity constraint with respect to  $m$ .
- II. If uttering  $S$  is unacceptable in an  $m$ -neutral context and acceptable in a minimally different  $m$ -positive context, trigger  $t$  imposes a Contextual Felicity constraint with respect to  $m$ .

In the remainder of this section, the application of this diagnostic is illustrated with Guaraní data. These applications demonstrate another, perhaps obvious, methodological issue: in eliciting judgments of felicity of an utterance in a context, the contexts should be plausible and natural-seeming given the experience of the consultant or experimental subject. The scenarios used in the applications below were invented by the first author to suit the particular fieldwork situation. However, these provide an illustration of the various ways in which the relevant kinds of contexts can be established.

The first set of data we discuss in (14) to (17) involves triggers that are not associated with a Contextual Felicity constraint with respect to the target implication  $m$ . As per the diagnostic in (13a), we come to this conclusion since the triggers of these contents  $m$  are acceptable in  $m$ -neutral contexts. The example in (14) features the expressive *aña memby* (devil child) ‘bastard’. Like English *bastard*, using the Guaraní expressive is acceptable in a context where the addressee does not have a low opinion of the referent and did not know prior to the speaker’s utterance that the speaker had a low opinion of the referent. The expressive is thus not associated with a Contextual Felicity constraint with respect to the (in this case) negative evaluation.

- (14) (*Context*) Julia and Maria work in a bakery; their boss treats them well. One day, he calls Julia into his office; when she emerges, she says to Maria:

Pe **aña memby** Márko ko’āga oi-pota a-mba’apo iñ-hermáno karnisería-pe.  
that devil child Marko now A3-want A1sg-work B3-brother butcher.shop-in

‘That bastard Marko now wants me to work in his brother’s butcher shop.’

The next pair of examples shows that appositives and NRRCs in Guaraní, like their English counterparts, are not associated with a Contextual Felicity constraint with respect to the descriptive content implications. In the examples in (15), these two types of expressions are used in  $m$ -neutral contexts, e.g. Raul does not need to already know that Simon is Maria’s ex-boyfriend in order for (15a) to be acceptable.<sup>13</sup>

---

<sup>13</sup>It is an open, empirical question whether expressives, appositives and NRRCs in Guaraní have what Potts (2005) calls an antibackgrounding requirement, such that utterances of sentences like (i), where the content of the e.g. appositive is already given in the context, are infelicitous “due to redundancy” (Potts 2005:34).

- (i) Simon che-kichiha-kue.                    Simon, che-kichiha-kue,                    o-ñe’ē Aleman.  
Simon B1sg-boyfriend-NOM.TERM Simon B1sg-boyfriend-NOM.TERM A3-speak German  
‘Simon is my ex-boyfriend. Simon, my ex-boyfriend, speaks German.’

While Guaraní consultants recognize the redundancy, utterances like (i) are not generally considered unacceptable. It is thus an open question whether this recognition of redundancy is sufficient for introducing an antibackgrounding requirement for the Guaraní expressions or whether this is an instance of cross-linguistic semantic/pragmatic variation.

- (15) a. (*Context*) Raul is new in town. His neighbor Simon invites him to his house for a party and introduces him to Maria. She tells him:

Simon, **che-kichiha-kue**, o-ñie’ë Aleman.  
 Simon B1sg-boyfriend-NOM.TERM A3-speak German  
 ‘Simon, my ex-boyfriend, speaks German.’

- b. (*Context*) The children in a history class have to give presentations about famous people. Malena has to talk about the pope. She starts with:

Papa Benedícto 16, **o-nasẽ-va’e-kue** **Alemánia-pe**, oi-ko Róma-pe.  
 Pope Benedict 16 A3-born-RC-NOM.TERM Germany-in A3-live Rome-in  
 ‘Pope Benedict the 16th, who was born in Germany, lives in Rome.’

We now turn to examples involving *aimete* ‘almost’ and *-nte* ‘only’. The example in (16a) shows that the adverb *aimete* ‘almost’ is not associated with a Contextual Felicity constraint with respect to the polar implication (here, that Malena didn’t throw up) or the proximal implication (here, that Malena came close to throwing up): the context of this example makes clear that the mother and father have no knowledge of what was going on with their daughter upstairs. The suffix *-nte* ‘only’ in (16b) is likewise felicitously used although the prejacent implication, that the youngest daughter cleans the house, is not known to the mother, and neither is the exclusive implication, that nobody other than the youngest daughter cleans the house.

- (16) a. (*Context*) A mother calls for her daughter to come down for dinner. Her daughter doesn’t appear so she goes upstairs to check on her. When she comes back down, she says to her husband:

Maléna hasy ra’e. **Aimete** o-gue’ë.  
 Malena B3.sick it.seems almost A3-vomit  
 ‘It seems that Malena is sick. She almost threw up.’

- b. (*Context*) Carla, a mother of three teenage daughters, falls on the way to the supermarket and breaks her leg. After being in the hospital for a week, the girls come to visit her. When she asks them how they are doing, her youngest daughter blurts out:

**Ché-nte** a-mo-potí ñande-róga!  
 pron.S.1sg-only A1sg-CAUS-clean B1pl.incl-house  
 ‘Only I clean our house!’

The next two examples involve triggers associated with a Contextual Felicity constraint with respect to one implication, but not another. The first such trigger we consider are demonstrative noun phrases, which are not associated with a Contextual Felicity constraint with respect to the descriptive content implication *m* that the demonstratum has the property denoted by the noun, as illustrated in (17a), but are associated with a Contextual Felicity constraint with respect to the indication implication *n* that the speaker identifies a suitable referent (as will shortly be illustrated with (19) below). Likewise, the third person pronoun *ha’e* in (17b) is not associated with a Contextual Felicity constraint with respect to the descriptive content implication *m* that the referent is human, but with respect to the existence implication *n* that there is a referent (and this, in turn, will be justified in the discussion of (20), below). To diagnose the relevant implications *m*, it is crucial that the context of the examples in (17) is *n*-positive since native speaker consultants might reject such utterances because the Contextual Felicity constraint associated with the implications *n* is not satisfied. Thus, the context of (17) is *n*-positive with respect to the implications *n* that there is a referent (for *ha’e*) and that the demonstratum can be identified (for the demonstrative noun phrase).

- (17) (*Context*) Maria and Sabina are walking across a meadow. They can see something ahead lying in the grass but can’t figure out whether it’s a rock, a piece of wood, an animal or a person. Maria has much better vision than Sabina and, as they approach, Maria says:

- a. **Pe kuimba’e** o-ke.  
that man A3-sleep  
'That man is sleeping.'
- b. **Ha’e** peteĩ kuimba’e.  
pron.S.3 one man  
'He's a man.'

Since the context of (17) is neutral with respect to the implications *m* that the referent of *ha’e* is human and the demonstratum of *pe kuimba’e* ‘that man’ is a man, the acceptability of (17a) and (17b) in this context is evidence that these expressions are not associated with a Contextual Felicity constraint with respect to these implications.

The third set of examples in (18) to (20) illustrate the application of the diagnostic for implications for which the relevant Guaraní triggers are associated with a Contextual Felicity constraint. As mentioned in section 2, we entertain the hypothesis that *avei* ‘too’ conveys an existence implication that there is an alternative proposition (see also Heim 1992; Geurts and van der Sandt 2001; Kripke 2009 for English *too*). Thus, in (18a), *avei* ‘too’ is hypothesized to convey the implication *m* that somebody besides the bus driver is eating empanadas. The context of (18a) is *m*-neutral since nobody else is known to be eating empanadas (Malena is eating a hamburger). As indicated by the hash mark (#), the consultants judged this utterance to be unacceptable in this context.<sup>14</sup>

- (18) a. (*Context*) Malena is eating her lunch, a hamburger, on the bus going into town. A woman who she doesn't know sits down next to her and says:  
 #Ñande-chofeur o-karu empanáda **avei**.  
 A1pl.incl-driver A3-eat empanada too  
 #'Our bus driver is eating empanadas, too.'

To conclusively show that the unacceptability of (18a) is due to *avei* ‘too’ introducing a Contextual Felicity constraint with respect to *m*, consultants were asked to judge the acceptability of the same utterance in the context in (18b) which is *m*-positive since Malena is eating empanadas, not a hamburger. The target utterance in (18a) was judged acceptable by the consultants in this context.

- (18) b. (*Context*) same as in (18a), except that Malena is eating empanadas.

Since (18a) and (18b) form a minimal pair, we conclude that *avei* ‘too’ in (18a) is associated with a Contextual Felicity constraint with respect to *m*.

The example in (19) features the demonstrative noun phrase *pe mitã'i* ‘that little boy’; we explore the implication *m* triggered by this noun phrase that the speaker identifies a suitable referent. As indicated, the utterance was judged unacceptable in the *m*-neutral context in (19a). The context in (19b) is *m*-positive: here, the information that introduces *m* to the common ground is presented in the form of a picture. Since the target utterance in (19a) is acceptable in the context in (19b), we conclude that demonstrative noun phrases in Guaraní (and English) introduce a Contextual Felicity constraint with respect to the implication that the speaker identifies a suitable referent.

- (19) a. (*Context*) The children in a sociology class have to give presentations about their families. Marko is up first and he starts with:

---

<sup>14</sup>The hash marks in the examples in (18) to (20), and others like them, are based on a variety of verbal means used by the four consultants we worked with on the Contextual Felicity constraint to indicate that they do not accept such examples, including (Spanish variants of) comments like “what?!?”, “*too* is not good here”, “I don’t like this”, “why do you say *too* here?” or “something is missing”, in combination with puzzled facial expressions or shaking of heads. In many cases, consultants also spontaneously offered amendments to the context which rendered the utterances acceptable, such as the first clause of (20b).

#Pe mitā-’i che-ryvy.  
 that child-DIM B1sg-younger.brother  
 #‘That little boy is my younger brother.’

- b. (*Context*) As in (19a), but now Marko also brings to the presentation a picture of a person that he shows to the class.

The last example of this set is concerned with the third person (human) pronoun *ha’e* and the implication that there is a referent. As illustrated in (20), the utterance with *ha’e* in (20a) is unacceptable: the context is *m*-neutral since such a referent is not made available in either the context of utterance or Marko’s utterance. In contrast, Marko’s first utterance in (20b) introduces such a third person, thus resulting in the second utterance being interpreted in an *m*-positive context. We conclude that *ha’e* is associated with a Contextual Felicity constraint with respect to the implication that there is a referent.

- (20) (*Context*) The children in a sociology class have to give presentations about their families. Marko is up first and he starts with:

- a. #Ha’e chokokue.  
 pron.S.3 farmer  
 #‘S/he is a farmer.’
- b. Che-ru rára Juan. Ha’e chokokue.  
 B1sg-father name Juan pron.S.3 farmer  
 ‘My father’s name is Juan. He is a farmer.’

We turn finally to some results which might seem surprising in light of standard assumptions: the behavior of Guaraní possessive noun phrases, change of state constructions and the complement of (*oi*)*kuaa* ‘know’ with respect to the Contextual Felicity diagnostic. As illustrated for these three construction types in (21a), (21b) and (21c), respectively, the Guaraní consultants judged these examples (and others like them) acceptable in contexts that are neutral with respect to the relevant implications: the context is neutral in (21a) with respect to the implication that the woman has a dog, the context in (21b) is neutral with respect to the implication that Laura used to do drugs, and (21c) is acceptable even though the addressee cannot be expected to already know the content of the complement clause, that the daughter has to use glasses to drive.

- (21) a. (*Context*) A woman who is being interviewed by a school director for a job as a teacher says:

A-ha-va’erā a-me’ē-ha-guā che-rymba jaguá-pe hembi’u-rā.  
 A1sg-go-MUST A1sg-give-NOM-PURP B1sg-domesticated.animal dog-at B3.food-NOM.PROSP  
 ‘I have to go now to feed my dog.’

- b. (*Context*) Laura asks her parents to sit down with her because she has to tell them something:

Nd-a-je-droga-vé-i-ma.  
 NEG-A1sg-JE-drug-more-NEG-already  
 ‘I’ve stopped doing drugs.’

- c. (*Context*) A girl backs out of a driveway and hits Susi’s car. A woman comes running out of the house, apologizes that her daughter hit Susi’s car and says:

Ha’e oi-kuaa o-moī-va’erā-ha i-lénte o-manefa-ha-guā.  
 pron.S.3 A3-know A3-put-MUST-NOM 3-glasses A3-drive-NOM-PURP  
 ‘She knows that she has to use her glasses to drive.’

Thus, according to the diagnostic in (13), none of these expressions are associated with a Contextual Felicity constraint with respect to the relevant implications.

As noted at the beginning of this section, there is a widespread view that (the English translations of) these expressions *do* impose constraints on contexts in which they are used. This view could be rendered consistent with the judgments reported here by assuming the availability of a process of *accommodation* (Lewis 1979, building on Stalnaker 1974), a process whereby the interpreter “updates” her view of the context to render it suitable for the utterance of the relevant trigger. From this theoretical perspective, those triggers which test positive on the diagnostic for the Contextual Felicity constraint are subject to a particularly strong version of the constraint which cannot be satisfied by accommodation. Those which test negative on the diagnostic might either be subject to a weak version of the constraint, allowing for satisfaction via accommodation, or might not be subject to the constraint at all. Simons et al. (2010) present arguments against the accommodation view, and we will interpret the results presented here as distinguishing between triggers which impose a Contextual Felicity constraint, and those which don’t. However, it would not significantly affect the overall conclusions of this paper if instead the diagnostic was taken to distinguish between triggers which have a strong Contextual Felicity constraint, and those which have a weak such constraint, if any.<sup>15</sup>

In sum, triggers of (projective) contents in both Guaraní and English fall into two groups with respect to the Contextual Felicity constraint: appositives, the adverb *aimete* ‘almost’ and the verb (*oi*)*kuaa* ‘know’ are not associated with a Contextual Felicity constraint, while certain implications of triggers like *avei* ‘too’, demonstrative noun phrases and pronouns are. The full set of results are summarized in Table 2 in section 7. These results replicate previous findings for English (see e.g. Chierchia and McConnell-Ginet 1990; Beaver 2001; Potts 2005); that comparable Guaraní expressions impose similar constraints contributes to our understanding of cross-linguistic semantic/pragmatic variation. Such a perhaps surprising lack of variation is also observed with regard to Projection, the property to which we turn now.

## 4 Projection

This section formulates a diagnostic for the Projection property, and discusses its application on the basis of Guaraní data. The relevant property, characterized in (22), refers to the ‘Family of Sentence variants’ of an atomic sentence *S*, which is defined as a set of sentences consisting of *S*, the negative of *S*, the interrogative of *S*, an epistemic modal variant of *S* and a conditional with *S* as its antecedent.

### (22) **Projection**

A content *m* of expression *t* is projective (i.e. has the property of Projection) if and only if *m* is typically implied by utterances of atomic sentences *S* containing *t* and may also be implied by utterances of Family of Sentence variants of *S*.

Given that Projection is the core property we are investigating, it might be expected that we would begin the paper with the diagnostic for this property. The reason we do not is that, in order to test a particular trigger for Projection, one must first determine whether the trigger is subject to a Contextual Felicity constraint (with respect to the target implication) or not. Where there is no such constraint, projection of implication *m* can be diagnosed using implication judgments in an *m*-neutral context. However, where there is such

<sup>15</sup>On the accommodation view, it is standard to assume that propositions can be accommodated only if they are relatively uncontroversial and plausible. The Guaraní consultants found acceptable (but chuckled at) utterances with possessive noun phrases in *m*-neutral contexts, even if it was highly implausible that the possessor could have the possesum (e.g. if *che-rymba jagua* ‘my dog’ in (21a) was replaced with *che-jaguarete* ‘my jaguar’). Only those utterances with the change of state construction were considered unacceptable that were false in the actual world (if, for instance, a consultant’s sister’s name was used in (21b) instead of *Laura*).

a constraint with respect to  $m$ , a different strategy must be used. In fact, in the literature, the Family of Sentences diagnostic is often applied to decontextualized examples, as illustrated for utterances containing *the present queen of France* in (1). However, this strategy cannot be used to elicit reliable judgments from consultants. Since decontextualized utterances containing triggers associated with a Contextual Felicity constraint are infelicitous, it is futile to ask a consultant to judge whether e.g. the Guaraní variants of (1a,b) with the demonstrative noun phrase *ko mburuvicha Fransiagua* ‘this boss of France’ in (23a,b) imply that there is a boss (king) of France.

- (23) a. #Ko mburuvicha Fransia-gua oi-ko Lóndre-pe.  
           this boss         France-from A3-live London-in  
           #‘This boss of France lives in London.’
- b. #Ko mburuvicha Fransia-gua nd-oi-kó-i Lóndre-pe.  
           this boss         France-from NEG-A3-live- NEG France-in  
           #‘This boss of France does not live in London.’

Matthewson (2004, 2006) does not apply the Family of Sentences diagnostic to explore presuppositions in St’át’imcets, presumably since the standard application of this diagnostic requires linguistically untrained consultants to make implication judgments, a type of judgment not considered by Matthewson (2004:380) to be among the “legitimate types of semantic judgment”. A methodology briefly entertained in Matthewson (2004) (but subsequently dismissed) is to “test the felicity of sentences like [(24a)], [(24b)], and [(24c)] in a range of discourse contexts, including some which do, and some which do not, contain information corresponding to the presupposition” (p.404).

- (24) Matthewson (2004:404)
- a. It is Mary who wants fish.
  - b. It isn’t Mary who wants fish.
  - c. Is it Mary who wants fish?

The idea, we assume, is that, if utterances of Family of Sentences variants are acceptable in  $m$ -positive contexts and not acceptable in  $m$ -neutral ones, one can conclude that a presupposition is triggered. While this is suitable for implications whose triggers are associated with a Contextual Felicity constraint with respect to that implication (and in fact adopted below to diagnose projection of such implications), it is not a reasonable diagnostic for projection for implications not associated with a Contextual Felicity constraint since triggers of such implications are acceptable in  $m$ -neutral contexts (see section 3). With such triggers, we argue, it is necessary to diagnose projection on the basis of implication judgments. Thus, it turns out to be necessary to use distinct diagnostics for Projection depending on whether a Contextual Felicity constraint is present.

The revised Family of Sentences diagnostic for Projection that can be applied with linguistically untrained native speaker consultants is given in (25). The diagnostic explores the implications of utterances of an atomic sentence  $S$  that may give rise to the implication  $m$  to be tested for projection, as well as the implications of utterances of other Family of Sentence variants of  $S$  (referred to as  $FOS(S)$  in (25)). Three subdiagnostics are distinguished: Subdiagnostic I., which applies to triggers associated with a Contextual Felicity constraint with respect to the projective content  $m$ , is the diagnostic that was entertained in Matthewson (2004), discussed in connection with (24) above. Subdiagnostic II. applies to triggers not associated with a Contextual Felicity constraint; like subdiagnostic III., it relies on implication judgments.

#### (25) Family of Sentences diagnostic for Projection

Let  $S$  be an atomic sentence which may give rise to implication  $m$  and  $FOS(S)$  be the Family of Sentences variants of  $S$ .

- I. **Trigger  $t$  imposes a Contextual Felicity constraint with respect to  $m$ :** If utterances of  $FOS(S)$  are judged unacceptable in an  $m$ -neutral context and acceptable in an  $m$ -positive context, the implication  $m$  is projective.
- II. **Trigger  $t$  does not impose a Contextual Felicity constraint with respect to  $m$ :** Test whether  $m$  is implied by utterances of  $FOS(S)$  in an  $m$ -neutral context.
- III. **Trigger  $t$  does not impose a Contextual Felicity constraint with respect to  $m$ , but with respect to some other implication  $n$ :** Test whether  $m$  is implied by utterances of  $FOS(S)$  in a context that is  $m$ -neutral and  $n$ -positive.

The distinction between subdiagnostics II. and III. is that the latter is used with triggers associated with a Contextual Felicity constraint not with respect to the implication  $m$  being tested but with respect to another implication  $n$ , which necessitates appropriately controlling the context. In both subdiagnostic II. and III. it is vital that the context is  $m$ -neutral so that a judgment that  $m$  arises from an utterance can be uncontroversially attributed to the utterance itself.

#### 4.1 The Family of Sentences in Guarani

The Guarani constructions used in the Family of Sentences diagnostic are illustrated in (26): the simple positive declarative sentence in (26a) is negated in (26b) and realized as a question in (26c). It occurs as a clausal complement of the possibility modal *i-katu* (B3-possible) ‘it’s possible’ in (26d) and constitutes the antecedent of a conditional, marked with *-ramo* ‘if’, in (26e).<sup>16</sup>

- (26) a. Kuehe Cárlos o-jahu.  
yesterday Carlos A3-bathe  
'Carlos bathed yesterday.'
- b. Kuehe Cárlos **nd-o-jahú-i**.  
yesterday Carlos NEG-A3-bathe-NEG  
'Carlos didn't bathe yesterday.'
- c. Kuehé-**pa** Cárlos o-jahu?  
yesterday-QU Carlos A3-bathe  
'Did Carlos bathe yesterday?'
- d. **I-katu** Cárlos o-jahu kuehe.  
B3-possible Carlos A3-bathe yesterday  
'It's possible that Carlos bathed yesterday.'
- e. Kuehe Cárlos o-jahú-**ramo**, heta o-ké-ta ko ára-pe.  
yesterday Carlos A3-bathe-if much A3-sleep-PROSP this day-at  
'If Carlos bathed yesterday, he is going to sleep a lot today.'

While an utterance of the atomic sentence in (26a) commits a Guarani speaker to the proposition that Carlos bathed yesterday, none of the utterances in (26b-e) do, which we maintain renders these constructions suitable for the Family of Sentences diagnostic for projection. To motivate that this is the case, consider, for example, utterances of (26a-e) in the context in (27):

- (27) (*Context*) Carlos is a baby and his sister Maria needs to tell Carlos' caretaker whether Carlos bathed yesterday. Maria overhears her mother say (26a-e) to her father.

---

<sup>16</sup>Propositional attitude constructions with e.g. ‘think’, ‘say’ and ‘wonder’ have also been successfully applied in Guarani to diagnose Projection, but are omitted here for reasons of space. With such constructions, one must control for the possibility of modal subordination (Roberts 1989, 1995; Heim 1992).

Consultants were asked whether Maria would tell the caretaker that Carlos had a bath yesterday or not: they responded ‘yes’ with respect to (26a), ‘no’ with respect to (26b) and ‘I don’t know’ with respect to (26c-e). This suggests that (26b-e) do not imply that Carlos bathed yesterday, i.e. that uttering these constructions does not commit the speaker to the content of atomic sentence embedded in the constructions.

Some additional comments about these constructions are in order. First, sentential negation in Guaraní is realized as a verbal circumfix, as illustrated above, and only expressions inside the circumfix are in the scope of negation (Tonhauser 2009). Since, for instance, adverbs like *avei* ‘too’ cannot occur inside the negation circumfix, as illustrated in (28b), negation is not always a suitable construction for testing projection in Guaraní (see also footnotes 17 and 18 below).

- (28) a. Carlos nd-o-jahú-i avei.  
           Carlos NEG-A3-bathe-NEG too  
           ‘Carlos didn’t bathe either.’  
       b. \*Carlós nd-o-jahu-avei-(r)i.

The question in (26c) is not the only possible way to form a question from (26a). A question can also be formed by realizing (26a) with an utterance-final rising intonation and by the variant in (29), where the question marker *-pa* ‘qu’ is realized on *Cárcos*.

- (29) Cárolo-pa kuehe o-jahu?  
Carlos-QU yesterday A3-bathe  
'Did Carlos bathe yesterday?'

No meaning differences between these question variants have been identified so far. This paper therefore assumes that they can all be analyzed as a question operator applying to the meaning of the atomic sentence. But the possibility of the questions differing e.g. in their information-structural contribution and possible effects of this variability on projection should be kept in mind.

In addition to the modal construction illustrated in (26d), Guaraní also has modal suffixes, including the necessity modal *-va'erā* in (30a) and the possibility modal *-ne* in (30b). Since the syntactic relation between these modal suffixes and triggers of projective content is not necessarily apparent from the surface string, this paper only uses the modal construction with *i-katu* (B3-possible) to diagnose projection: as illustrated in (30c), we assume that the modal embeds a clause (marked by square brackets), which may contain a trigger.

- (30) a. (*Context*) A woman has just heard that a man's daughter has gotten married.  
 O-vy'a-íterei-va'erā.  
 A3-happy-very-MUST  
 'He must be very happy.' (theater play, presented in Tonhauser to appear a)

b. (*Context*) A family is discussing who might disrespect them. The father says to the daughter:  
 Nde rei-kuáa-ne, che-memby!  
 pron.S.2sg A2sg-know-MIGHT B1sg-child  
 'You might know, my child!' (theater play, presented in Tonhauser to appear a)

c. **I-katu** [Cárlos o-jahu kuehe].  
 B3-possible Carlos A3-bathe yesterday  
 'It's possible that Carlos bathed yesterday.'

We now diagnose Projection in Guarani.

## 4.2 Diagnosing projection

Subdiagnostic I. of the revised Family of Sentences diagnostic for projection in (25) identifies the content *m* of a trigger *t* as projective if and only if utterances of *FOS(S)*, where *S* contains the trigger *t*, are judged unacceptable in an *m*-neutral context and acceptable in an *m*-positive context. Recall that this subdiagnostic is to be used for triggers which have already been determined to be subject to the Contextual Felicity constraint with respect to *m*. The idea is that Projection, in these cases, is diagnosed by showing that a constraint associated with a given trigger remains in force even when the trigger is embedded.

The application of the diagnostic to the existence implication of *avei* ‘too’ is illustrated in (31) and (32): the atomic utterance in (31a) as well as the Family of Sentences variants of (31a) in (31b-d) contain *avei* ‘too’. The context in (31) is *m*-negative since nobody besides the bus driver is (known to be) eating empanadas, while that in (32) is *m*-positive.<sup>17</sup>

- (31) (*Context*) Malena is eating her lunch, a hamburger, on the bus going into town. A woman who she doesn’t know sits down next to her and says:

- a. #Ñande-chofeur o-karu empanáda **avei**. (= (18a))  
A1pl.incl-driver A3-eat empanada too  
#‘Our bus driver is eating empanadas, too.’
- b. #I-katu o-karu empanáda **avei** ñande-chofeur.  
B3-possible A3-eat empanada too A1pl.incl-driver  
#‘It’s possible that our bus driver is eating empanadas, too.’
- c. #O-karú-ramo empanáda **avei** ñande-chofeur, a-sē-ta kolektívō-gui.  
A3-eat-if empanada too A1pl.incl-driver A1sg-leave-PROSP bus-from  
#‘If our bus driver is also eating empanadas, I am going to leave the bus.’
- d. #O-karú-pa empanada **avei** ñande-chofeur?  
A3-eat-QU empanada too A1pl.incl-driver  
#‘Is our driving eating empanadas, too?’

- (32) (*Context*) same as in (31), except that Malena is eating empanadas. (= (18b))

The consultants judged that utterances of the atomic sentence in (31a) as well as utterances of Family of Sentence variants of (31a) in (31b-d) are acceptable in the context of (32), but not in the context in (31). We therefore conclude that the Family of Sentences diagnostic for projection identifies the existence implication of *avei* ‘too’ as projective.

The examples in (33) explore the projectivity of the existence implication of the pronoun *ha’e* (that there is a referent). As indicated, (33b-f) are acceptable in the *m*-positive context established by the utterance in (33a). None of (33b-f) are acceptable without (33a), i.e. in an *m*-neutral context. We therefore conclude that the existence implication is projective.

<sup>17</sup>As discussed in connection with (28) above, *avei* ‘too’ cannot be realized inside the negation circumfix. The negative variant of (31a) in (i) is acceptable in the context in (31), which is congruent with the hypothesis that *avei* ‘too’ here is not in the scope of negation. The variant in (i) is thus not suitable to diagnose whether the implication *m* of (31a) is projective.

- (i) (*Context*) as in (31)

Ñande-chofeur nd-o-karú-i empanáda **avei**.  
A1pl.incl-driver NEG-A3-eat-NEG empanada too

‘Our driver isn’t eating empanadas either.’

- (33) (Context) Paula is watching a soccer match with Maria, who utters (33a), followed by one of (33b-f).
- E-ma'ẽ-mi. Pe arkéro o-joko-kuaa.  
A2sg-look-DIM that goalie A3-grab-know  
'Look. That goalie knows how to grab the ball.'
  - Ha'e** Caaguasu-gua.  
pron.S.3 Caaguasu-from  
'He's from Caaguasu.'
  - Ha'ẽ-pa** Caaguasu-gua?  
pron.S.3-QU Caaguasu-from  
'Is he from Caaguasu?'
  - Ha'e** nda-che-kuáa-i chéve.  
pron.S.3 NEG-B1sg-know-NEG pron.O.1sg  
'He doesn't know me.'
  - I-katu **ha'e** Caaguasu-gua.  
B3-possible pron.S.3 Caaguasu-from  
'It's possible that he's from Caaguasu.'
  - Ha'e** o-porandú-ramo che-número, a-vy'á-ta.  
pron.S.3 A3-ask-if B1sg-number A1sg-happy-PROSP  
'If he asks for my number, I am going to be happy.'

Subdiagnostic II. of the Family of Sentences diagnostic for projection in (25) identifies a content *m* as projective if and only if utterances of *FOS(S)*, where *S* contains the trigger *t*, imply *m*. This subdiagnostic is used for triggers which do *not* impose any Contextual Felicity constraint. The examples in (34) illustrate the application of the diagnostic to an NRRC: the relative clause in (34a) implies that Sabina's grandfather has a white beard. The context in (34) is *m*-neutral since it does not entail either that Sabina's grandfather has a white beard or that he doesn't. To diagnose whether this implication is projective, native speaker consultants were told that Sabina or her mother say one of (34a-e) to Pamela. The consultants were then asked to judge whether these utterances would lead Pamela to want to take pictures of Sabina's grandfather. A [yes] after the example indicates that the consultants thought that Pamela would try to take his picture, a [no] means that the consultants did not think that Pamela would try to take his picture.

- (34) (Context) Pamela is an art student who wants to take black & white portraits of old men with white beards. Her friend Sabina says (34a-d) to her; (34e) is uttered by Sabina's mother:
- Che-aguélo, **hendyva morotí-va**, oi-ko mombyry. [yes]  
1sg-grandfather B3.beard white-RC A3-live far  
'My grandfather, who has a white beard, lives far away.'
  - Che-aguélo, **hendyva morotí-va**, nd-oi-kó-i mombyry. [yes]  
B1sg-grandfather B3.beard white-RC NEG-A3-live-NEG far  
'My grandfather, who has a white beard, doesn't live far away.'
  - Nd-o-mba'apó-i-rõ ko'ëro che-aguélo, **hendyva morotí-va**, ja-visitá-ta  
NEG-A3-work-NEG-if tomorrow B1sg-grandfather B3.beard white-RC A1pl.incl-visit-PROSP  
chupe. [yes]  
pron.O.3  
'If my grandfather, who has a white beard, doesn't work tomorrow, we'll visit him.'

- d. I-katu che-aguélo, **hendyva morotí-vá**, o-heja re-nohē chupe foto. [yes]  
 B3-possible B1sg-grandfather B3.beard white-RC A3-let A2sg-take pron.O.3 foto  
 'It's possible that my grandfather, who has a white beard, will let you take his picture.'
- e. Sabina's mother, who knows about Pamela's project, comes and asks Sabina:  
 E-porandú-ma-pa nde-aguélo, **hendyva morotí-vá-pe?** [yes]  
 A2sg-ask-already-QU B2sg-grandfather B3.beard white-RC-to  
 'Have you already asked your grandfather, who has a white beard?'

As indicated, the consultants judged each utterance to convey information that would lead Pamela to want to take pictures of Sabina's grandfather. Since Pamela is interested in taking pictures of old men with white beards, we hypothesize that the consultants' responses are due to the content of the NRRC being implied by the examples in (34), thus supporting the hypothesis that this content is projective.

The examples in (35) below show application of the diagnostic to the pre-state implication of the Guaraní change of state construction, which is realized using the negation circumfix, as illustrated in (35a). The consultants were asked whether Maria would give the medicine to Marko, given the utterances in (35a-d), with **yes** and **no** as possible answers.

- (35) (*Context*) There is a health program that gives medicine to everybody who has ever smoked or currently smokes. Maria is administering the program in a particular town; since she doesn't know the people in the town, she is being assisted by Mario, a local townsman, who tells her (35a-c) about Marko; (35d) is uttered by another local.

- a. Márko **nd-o-pita-vé-i-ma.** [yes]  
 Marko NEG-A3-smoke-more-NEG-PERFECT  
 'Marko doesn't smoke anymore'
- b. I-katu Márko **nd-o-pita-vé-i-ma.** [yes]  
 B3-possible Marko NEG-A3-smoke-more-NEG-PERFECT  
 'It's possible that Marko doesn't smoke anymore.'
- c. Márko **nd-o-pita-vé-i-ma-rō,** nd-o-guerekó-i pirapire. [yes]  
 Marko NEG-A3-smoke-more-NEG-PERFECT-if NEG-A3-have-NEG money  
 'If Marko doesn't smoke anymore, he doesn't have money.'
- d. Maria hears another person ask Mario:  
 Márko-pa **nd-o-pita-vé-i-ma?** [yes]  
 Marko-QU NEG-A3-smoke-more-NEG-PERFECT  
 'Does Marko not smoke anymore?'

As indicated, the consultants thought that Maria would administer the medicine to Marko as a consequence of each of the utterances in (35a-d). This suggests that each of these utterances implies that Marko used to smoke. We therefore conclude that the implication that the pre-state held is projective.

The examples in (36) illustrate the application of the diagnostic for Projection to the prejacent implication of utterances containing the suffix *-nte* 'only'. In the given context, the prejacent implication of (36a) is the implication that three rings have been stolen. The consultants were asked, given the utterances in (36), how many rings the speaker thought had been taken.

- (36) (*Context*) Clara sells expensive rings. One night, she receives a call from the police telling her that her store has been broken into. At the store, she takes a quick inventory to tell the police whether something is missing. She says one of (36a-c) about the thief; (36d) is uttered by Clara's husband:

- a. Mbohapý-**nte** o-monda.  
three-only A3-steal  
'He stole only three.'
- b. I-katu mbohapý-**nte** o-monda.  
B3-possible three-only A3-steal  
'It's possible that he stole only three.'
- c. Mbohapý-**nte** o-mondá-ramo, a-vy'a.  
three-only A3-steal-if A1sg-happy  
'If he stole only three, I am happy.'
- d. Additional context: Clara's husband also arrives at the store and quickly assess the inventory of remaining rings. He asks Clara:  
O-mondá-pa mbohapý-**nte**?  
A3-steal-QU three-only  
'Did he steal only three?'

The three consultants we worked with on Projection consistently judged that (36a) conveys that three rings (and not more) were stolen, and that (36b-d) convey that at least three rings (and possibly more) were stolen. These responses suggest that the prejacent implication arises from each of (36a-d).<sup>18</sup> We therefore conclude that the prejacent implication of *-nte* 'only' is projective.

While the three consultants' responses for (36) uniformly support the hypothesis that the prejacent implication of an utterance with *-nte* 'only' is projective, this was not the case for all examples used to test the projection of the prejacent of *-nte* 'only' and the polar implication of *aimete* 'almost'. While one consultant consistently gave responses on a variety of sets of examples that support the hypothesis that these two implications are projective, the other two consultants gave responses to several examples containing these triggers that did not support the hypothesis (in particular when the trigger was embedded under a modal or occurred in the antecedent of a conditional). Thus, while there is evidence that the prejacent of *-nte* 'only' and the polar implication of *aimete* 'almost' is projective in Guarani, we note that their projective behavior may be less robust than that of implications of other triggers (where the three consultants' judgments strongly agreed with each other).

Subdiagnostic III. applies when diagnosing implications *m* of triggers not associated with a Contextual Felicity constraint with respect to *m* but with respect to another implication *n*. The difference from subdiagnostic II. is that the context constructed for the target utterances must entail the content of the implication *n*, to prevent infelicity due to failure of a Contextual Felicity constraint. The application of the diagnostic is illustrated with the examples in (37) which contain the demonstrative noun phrase *pe óga* 'that house'; as discussed in section 3, such noun phrases are associated with a Contextual Felicity constraint with respect to the implication that the speaker identifies a suitable referent, but not with respect to the property attribution implication. The context of (37) is thus constructed such that the speaker (Ricardo) identifies a suitable referent (both Raul and Ricardo see something ahead in the woods) but Raul does not know what property the demonstratum has. To diagnose whether the implication *m* is projective, the native speaker consultants were asked to judge what Raul will think is ahead in the woods, given Ricardo's utterances in (37a-e).

---

<sup>18</sup>By similar logic to that discussed in footnote 17, the negative variant of (36a) given in (i) is not suitable to diagnose projection:

- (i) Mbohapý-**nte** nd-o-mondá-i.  
three-only NEG-A3-steal-NEG  
'Only three were not stolen.'

The annotation [**a house**] after the examples indicates that the consultants thought that Raul would think that a house was ahead in the woods, given that particular utterance. This is evidence that the implication that the demonstratum has the property denoted by the noun survives when the demonstrative noun phrase *pe óga* ‘that house’ occurs embedded in Family of Sentences variants, i.e. that the implication is projective.

### 4.3 Summary and discussion

This section has shown that the contents explored in section 3 are indeed projective contents. Crucially, we presented evidence that Guaraní has expressions that give rise to projective contents, thus providing the first systematic evidence of projection in a non-European language. The set of contents identified as projective are summarized in Table 2 in section 7.

The crucial insight behind the diagnostic for Projection is that different subdiagnostics are needed for triggers that are associated with a Contextual Felicity Constraint and those that are not. The diagnostic developed for the former case relies on judgments of felicity; that for the latter case depends on implication judgments. A slightly revised statement of the diagnostic is given in (38), where the subdiagnostics II. and III. of the version in (25) are folded into subdiagnostic II. with the additional requirement that the context be appropriately controlled for, as illustrated above.

- (38) Family of Sentences diagnostic for Projection (revised)

Let  $S$  be an atomic sentence which may give rise to implication  $m$ . Let  $FOS(S)$  be a set of sentences consisting of  $S$ , the negative of  $S$ , the interrogative of  $S$ , a modal variant of  $S$  and a conditional with  $S$  as its antecedent.

- I. **Trigger  $t$  imposes a Contextual Felicity Constraint with respect to  $m$ :** If utterances of  $FOS(S)$  are judged unacceptable in an  $m$ -neutral context and acceptable in an  $m$ -positive context, the implication  $m$  is projective.
  - II. **Trigger  $t$  does not impose a Contextual Felicity Constraint with respect to  $m$ :** Test whether  $m$  is implied by utterances of  $FOS(S)$  in a context that is  $m$ -neutral and appropriately controls for contextual constraints introduced by the trigger.

It is our hope that this diagnostic can contribute to filling the gap in the literature on projection and projective contents, which has mostly relied on data from languages with native speaker semanticists.

An important difference between the present study and previous studies of projective content in many languages, including English, concerns the evidence provided for projection. Levinson and Annamalai (1992), for example, only list Tamil sentences alongside their claimed presuppositions (see also von Fintel and Matthewson 2008:182 for this point) and Matthewson (2006) argues that the St'át'ímcets expressions *hu7* ‘more’, *múta7* ‘again/more’, *tsukw* ‘stop’ and *t'it* ‘also’ are presupposition triggers, but also does not provide evidence for projection. In contrast, the previous section has provided detailed empirical evidence for the relevant contents being projective. This evidence consists of i) the relevant contextualized utterances that form part of the diagnostic, ii) the questions posed to the consultants, iii) the consultants’ responses, and iv) our reasoning for taking these responses to support the hypothesis that the relevant contents are projective. It is vital to provide such evidence, even when working on a language like English with many native speaker semanticists, since it constitutes the empirical support for a claim about projectivity, but also since it allows for the results to be replicated (in the same language) and compared to the results in other languages.

One result of the data presented so far is that Guaraní has different kinds of projective contents: those associated with a Contextual Felicity constraint and those that are not. Matthewson (2006) finds that St'át'ímcets utterances with the expressions mentioned above are acceptable to St'át'ímcets speakers in (what we call) *m*-neutral contexts, which suggests that they are not associated with a Contextual Felicity constraint. This means that Guaraní may differ from St'át'ímcets, at least with respect to the triggers *avei* ‘too’ (Guaraní) and *t'it* ‘also’ (St'át'ímcets), but perhaps not with respect to the triggers *n(d)(a)–…vé-i-ma* ‘stop’ (Guaraní) and *tsukw* ‘stop’ (St'át'ímcets).

The finding that Guaraní translations of English triggers of projective content are also triggers of projective content is new. Whether the finding is also surprising depends on one’s assumptions about the way in which projective content arises. One position is that natural language expressions conventionally encode their ordinary and their projective content (e.g. Karttunen and Peters 1979). On this view, we might expect to find cross-linguistic differences in whether e.g. the polar implication of an expression like *almost* and its translation in other languages is projective or not; the finding that comparable Guaraní and English expressions so consistently convey the same projective contents is perhaps surprising on this view. Another position is that projective contents are associated with particular expressions by some universal mechanism (e.g. Levinson and Annamalai 1992; Levinson 2011) or that such contents are non-detachable and conversationally derived, so that two expressions (from the same language or from different languages) with the same truth-conditional meaning would have the same projective content (e.g. Levinson 1983, Simons 2001). On this view, one might not expect to find cross-linguistic differences in the projective contents conveyed by comparable expressions. The finding from English and Guaraní then presents some support for this view.

## 5 Local effects associated with projective content

The properties of Projection and Contextual Felicity distinguish two classes of projective contents in English and Guaraní. In this section, we explore another property of projective contents: the property ‘Local Effect’, defined in (39), distinguishes projective contents that are necessarily contributed to the local context of an operator from those that are not (i.e. can be merely globally contributed); see also e.g. Gazdar (1979), Zeevat (2000) and Potts (2005) for discussions of the variability of projective contents with respect to this property.

### (39) **Local Effect**

A trigger *t* of projective content *m* has its effect locally (i.e. has Local Effect) if and only if, when *t* is syntactically embedded in the complement of operator *O*, *t* contributes the content *m* to the local context of interpretation for the complement of *O*.

Because the property being investigated is perhaps not very familiar, we begin by illustrating it with some cases from English. The embedding operators considered here for the Local Effect diagnostic are contributed by propositional attitude verbs such as *believe* and *think*. (Other operators that could be used to diagnose Local Effect include modals and conditionals.) The local context of interpretation created by these verbs is the attitude holder's epistemic state: the clausal complement of the verb is interpreted in this local context, which is potentially distinct from the global (utterance) context. Some propositions denoted by the complement clause may be true in one of the contexts, false in the other. Consider the examples in (40):

- (40) a. Jane believes that Bill has **stopped smoking** (although he's actually never been a smoker).
- b. Jane believes that Bill, **who is Sue's cousin**, is Sue's brother.

We are interested here in the interaction between the propositional attitude verb and the projective contents of the embedded clauses: in (40a), the proposition that Bill has been a smoker, and, in (40b), the proposition that Bill is Sue's cousin. In (40a), the complement of *believe* attributes to Jane the belief that Bill has stopped smoking, which necessarily also attributes to her the belief that Bill has been a smoker in the past, i.e. belief in the pre-state of the predicate *stop smoking*. This is what we refer to as a Local Effect: the projective content of *stop smoking* is part of the belief attributed to the attitude holder.

This behavior is in contrast with that of the NRRC in sentence (40b). Although this clause is (at least by appearance) embedded within the complement clause of *believe*, its content does not contribute to the belief attribution: the speaker of (40b) does not attribute to Jane the belief that Bill is Sue's cousin, but only the belief that Bill is Sue's brother, i.e. the utterance does not attribute contradictory beliefs to Jane. This shows that the projective content contributed by the NRRC does not have a Local Effect.

The diagnostic for Local Effect is given in (41). Like the diagnostic for Projection, it has three parts: subdiagnostic I. applies to triggers  $t$  associated with a Contextual Felicity constraint with respect to  $m$ ; subdiagnostics II. and III. apply to trigger/content pairs where the trigger is not associated with a Contextual Felicity constraint with respect to  $m$ , though alternatively II. and III. could have been combined, as discussed for Projection above. In the three subdiagnostics, it is assumed that  $S_1$  is an atomic sentence with trigger  $t$  of meaning  $m$  and  $S$  is a sentence where  $S_1$  is embedded under a propositional attitude verb. If the trigger  $t$  of content  $m$  has its effect locally,  $m$  is part of the belief state of the bearer of the attitude. If, on the other hand, the trigger  $t$  of content  $m$  does not have its effect locally, i.e. may have its effect merely globally,  $m$  need not be part of the belief state of the bearer of the attitude.

Recall that triggers associated with a Contextual Felicity constraint require the content  $m$  to be part of the relevant context prior to utterance (section 3). With such triggers, Local Effect is diagnosed (per subdiagnostic I.) by setting up a situation in which  $m$  is part of the global (utterance) context, but in which the bearer of the attitude is explicitly ignorant of  $m$ , i.e.  $m$  is not part of the local context, the belief state of the bearer of the attitude. If an utterance of  $S$  is unacceptable in this situation, we assume that this is because  $m$  needs to be part of the local context prior to utterance (which is not the case), i.e. the trigger  $t$  of content  $m$  has Local Effect. If, on the other hand, utterance of  $S$  is acceptable in this situation, we assume that this is because  $m$  need not be part of the local context but may be merely part of the global context prior to utterance, i.e. the trigger  $t$  of content  $m$  does not have Local Effect.

With triggers not associated with a Contextual Felicity constraint with respect to content  $m$  (subdiagnostics II. and III.), the diagnostics for Local Effect are based on the general assumption that the belief state of a (rational) bearer of an attitude cannot contain both the content  $m$  contributed by the trigger  $t$  as well as the negation of the content, i.e.  $\neg m$ . With such triggers, Local Effect is diagnosed by setting up a situation where the belief state of the bearer of the attitude contains  $\neg m$ . If an utterance of  $S$  is unacceptable in this situation, we assume that this is because trigger  $t$  contributes the content  $m$  locally, i.e. to the belief state of the bearer of the attitude: utterance of  $S$  is unacceptable since the belief state of the bearer of the attitude contains both  $m$  and  $\neg m$ . If, on the other hand, utterance of  $S$  is acceptable in this situation, we assume

that this is because  $m$  is not contributed locally, but may be contributed merely globally, i.e. the trigger  $t$  of content  $m$  does not have Local Effect. In this case, only  $\neg m$  is part of the belief state of the bearer of the attitude.<sup>19</sup>

(41) **Diagnostic for Local Effect:**

Let  $S_1$  be an atomic sentence with trigger  $t$  of meaning  $m$ .

- I. **Trigger  $t$  imposes a Contextual Felicity constraint with respect to  $m$ :** Let  $S$  be a sentence where  $S_1$  is embedded under a propositional attitude predicate. If utterance of  $S$  is unacceptable when the common ground entails  $m$  but the bearer of the attitude is explicitly ignorant of  $m$ , then the meaning  $m$  with trigger  $t$  has its effect locally.
- II. **Trigger  $t$  doesn't impose a Contextual Felicity constraint:** Three possible implementations:
  1. Let  $S_2$  be an atomic sentence that implies  $\neg m$ , and  $S$  a sentence where both  $S_1$  and  $S_2$  are conjoined under the same propositional attitude predicate. If utterance of  $S$  is unacceptable, then the meaning  $m$  with trigger  $t$  has its effect locally.
  2. Let  $S_2$  be an atomic sentence that implies  $\neg m$ ,  $A$  an attitude predicate and  $H$  a subject noun phrase that denotes an attitude holder. If utterance of  $S$  of the form “ $H A S_1$  and  $H A S_2$ ” is unacceptable, then the meaning  $m$  with trigger  $t$  has its effect locally.
  3. Let  $S_2$  be an atomic sentence that contains both trigger  $t$  of meaning  $m$  and also implies  $\neg m$ . Let  $S$  be a sentence where  $S_2$  is embedded under a propositional attitude predicate. If utterance of  $S$  is unacceptable, then the meaning  $m$  with trigger  $t$  has its effect locally.
- III. **Trigger  $t$  doesn't impose a Contextual Felicity constraint with respect to  $m$ , but with respect to another implication  $n$ :** This subdiagnostic has the same three possible implementations as subdiagnostic II., with the addition that the context in which  $S$  is uttered entails that the bearer of the attitude knows  $n$ .

## 5.1 Propositional attitude complements in Guarani

The Guarani examples used to diagnose Local Effect feature the propositional attitude verb (*oi*)mo'ã ‘think’, illustrated in (42): the attitude holder is referred to by the pre-verbal proper name *Juan*; the sentential complement of the attitude predicate is *i-sy hasy* ‘his mother is sick’, which is (obligatorily) marked with the nominalizing suffix *-ha* ‘NOM’ on the (verbal) predicate of the sentential complement.

- (42) Juan oi-mo'ã i-sy hasy-ha.  
       Juan A3-think B3-mother B3.sick-NOM  
       ‘Juan thinks that his mother is sick.’

Subdiagnostics II. and III. of the diagnostic for Local Effect call for propositional attitude constructions with conjoined clauses complements. In the example in (43), the clausal complements are conjoined with *ha* ‘and’. Evidence that both clauses are complements of the propositional attitude verb is that the verbs of both clauses are marked with the nominalizing suffix *-ha* (which does not occur on matrix clause verbs).

- (43) Juan oi-mo'ã [[i-sy hasy-ha] ha [i-túva i-kaigue-ha]]  
       Juan A3-think B3-mother B3.sick-NOM and B3-father B3-sluggish-NOM  
       ‘Juan thinks that his mother is sick and that his father is sluggish.’

---

<sup>19</sup>We note here that our diagnostics for Local Effect use a surface level notion of locality. As a result, interpretation of the diagnostics is potentially complicated by the fact that an absence of Local Effect could result from different sources. For example, in a framework involving a level of Logical Form (LF) distinct from surface form, perhaps mediated by syntactic movement, there would be a non-surface notion of locality (i.e. locality at LF). In such frameworks, it would be important to know where the trigger was interpreted at LF before drawing strong conclusions about the nature of the projective inferences associated with the trigger.

Some propositional attitude constructions were considered less natural by some consultants unless the propositional attitude verb was repeated, as in the variant of (43) in (44). We remain agnostic here about whether (44) involves conjunction of sentences (with no independent noun phrase realizing the subject of the second conjunct) or conjunction of verb phrases. What is important is that both complements are understood as being interpreted with respect to Juan's epistemic state.

- (44) Juan oi-mo'ã i-sy hasy-ha ha oi-mo'ã (avei) i-túva i-kaigue-ha  
 Juan A3-think B3-mother B3.sick-NOM and A3-think too B3-father B3-sluggish-NOM  
 'Juan thinks that his mother is sick and he (also) thinks that his father is sluggish.'

That propositional attitude constructions with (*oi*)*mo'ã* 'think' indeed create a local context distinct from the global utterance context is illustrated with the examples in (45). In (45a), the global context is one in which Juan's mother is not sick, but the local context created by the propositional attitude verb is one according to which Juan's mother is sick in Juan's belief worlds. (45b) is not contradictory since Juan's belief worlds need not be identical to those of the speaker.

- (45) (Context) The speaker has just visited Juan's mother and knows that she is healthy.

- a. Juan oi-mo'ã i-sy hasy-ha há=katu na-'añeté-i.  
 Juan A3-think B3-mother B3.sick-NOM and=CONTRAST NEG=true-NEG  
 'Juan thinks that his mother is sick but that's not true.'
- b. Juan oi-mo'ã i-sy hasy-ha há=katu che n-ai-mo'ã-i.  
 Juan A3-think B3-mother B3.sick-NOM and=CONTRAST pron.S.1sg NEG-A1sg-think-NEG  
 'Juan thinks that his mother is sick but I don't think so.'

We now diagnose Local Effect in Guarani.

## 5.2 Diagnosing Local Effect

Subdiagnostic I. of the Local Effect diagnostic in (41) is used for triggers *t* of contents *m* associated with a Contextual Felicity constraint. It identifies a content *m* as having its effect locally if uttering a sentence *S* (that embeds the sentence that contains the trigger *t* of *m* under a propositional attitude verb) is unacceptable when the global context entails *m* but the bearer of the attitude is explicitly ignorant of *m* (i.e. the local context is *m*-neutral). In (46), we apply this diagnostic to the existence implications of the triggers *avei* 'too' and the pronoun *ha'e*.

- (46) a. #Raul o-va Buénos Áires-pe, há=katu Juan nd-oi-kuáa-i. Ha'e oi-mo'ã  
 Raul A3-move Buenos Aires-to and=CONTRAST Juan NEG-A3-know-NEG pron.S.3 A3-think  
 Maléna **avei** o-va-ha Buénos Áires-pe.  
 Malena too A3-move-NOM Buenos Aires-to  
 #Raul moved to Buenos Aires, but Juan doesn't know that. He thinks that Malena, too, moved to Buenos Aires.'
- b. (Context) The speaker, Ricardo and Malena are lost in a city they've never visited before. The speaker, who, together with Ricardo, is a bit ahead of Malena, says:  
 #E-ma'ẽ-mi! Upépe o-ĩ peteĩ kuimba'e. Maléna nd-o-hechá-i. Ha'e oi-mo'ã  
 A2sg-look-DIM there A3-be one man Malena NEG-A3-see-NEG pron.S.3 A3-think  
**ha'e** hasy.  
 pron.S.3 B3.sick  
 #Look! There's a man. Malena doesn't see him. She thinks he is sick.'

The global context of (46a) is *m*-positive since Raul is known to have moved to Buenos Aires; the relevant local context is *m*-neutral since the attitude holder Juan is not aware that Raul moved to Buenos Aires. The respective global and local contexts in (46b) are *m*-positive and *m*-neutral, too: while the existence of the man is given in the global context, Malena is explicitly ignorant it. We conclude from the unacceptability<sup>20</sup> of the utterances in (46) that these triggers require their respective implications *m* to have their effect locally, i.e. with respect to the epistemic state of the attitude holder.

Subdiagnostic II. is used to diagnose triggers *t* of content *m* not associated with a Contextual Felicity constraint. In the examples in (47), the second implementation of the subdiagnostic is used to explore the polar implication of *aimete* ‘almost’ and the prejacent of *–nte* ‘only’. In (47a), for example, the clause embedded under the propositional attitude verb (*oi*)*mo’ā* ‘think’ in the first conjunct contains the trigger *aimete* ‘almost’, which implies (here) that Malena did not break her leg (*m*). The clause embedded under the second conjunct implies that Malena broke her leg (*–m*). Since the examples are unacceptable, we conclude that these triggers have Local Effect with respect to the relevant contents.

- (47) (Context) Juan is a doctor at the scene of an accident. His friend says:

- a. #Juan oi-mo’ā Maléna **aimete** o-pe-ha hetyma ha oi-mo’ā avei Maléna o-pe-ha  
Juan A3-think Malena almost A3-break-NOM B3.leg and B3-think also Malena A3-break-NOM  
hetyma.  
B3.leg  
#‘Juan thinks that Malena almost broke her leg and that Malena broke her leg.’
- b. #Juan oi-mo’ā Maléna-**nte** o-pe-ha hetyma ha oi-mo’ā avei Maléna  
Juan A3-think Malena-only A3-break-NOM B3.leg and A3-think too Malena  
nd-o-pe-i-ha hetyma.  
NEG-A3-break-NEG-NOM B3.leg  
#‘Juan thinks that only Malena broke her leg and that Malena didn’t break her leg.’

The example in (48) shows that the content of the complement of (*oi*)*kuaa* ‘know’ has Local Effect:

- (48) #Ángel oi-mo’ā i-túva oi-**kuaa**-ha iñ-ermána o-guereko kichiha ha Ángel oi-mo’ā avei  
Angel A3-think B3-father A3-know-NOM B3-sister A3-have boyfriend and Angel A3-think too  
iñ-ermána nd-o-guerekó-i kichiha.  
B3-sister NEG-A3-have-NEG boyfriend  
#‘Angel thinks that his father knows that his sister has a boyfriend and Angel also thinks that his sister  
doesn’t have a boyfriend.’

In (49), Local Effect is diagnosed for the appositive using the third implementation: the appositive implies *m* (that Angela Merkel is Germany’s president), while the remainder of the clause implies its negation (by way of implying that Angela Merkel is the president of Argentina).

- (49) (Context) Sabine is from Germany and knows the politicians there very well. Angela Merkel, the chancellor of Germany, is currently visiting farmers in Paraguay, among them Juan. Sabine says:<sup>21</sup>

<sup>20</sup>One of the four consultants we worked with on these examples considered (46b) acceptable. This consultant commented that Malena does not need to see the man to think of him that he is sick. This comment suggests that this consultant took the existence of the referent for *ha’e* to be entailed in Malena’s epistemic state, even though the referent is not salient for Malena, thus rendering the example acceptable. Examples not presented here suggest that the salience implication of *ha’e* does not have Local Effect, and this is in line with other observations on salience implications in section 6.

<sup>21</sup>The context of this example strongly reinforces that Sabine is an expert on German politics while Juan is not. This ensures that the content of the appositive cannot plausibly be part of the epistemic state of the attitude holder. Some utterances where the context was not constrained this way were judged unacceptable by the consultants, suggesting that appositives have Local Effect. Whether there is indeed difference in the extent to which appositives (and NRRCs) have Local Effect in English and Guaraní is a question for future research.

Juan oi-mo'ã Angéla Mérkel, **Alemánia mburuvicha**, ha'e-ha Argentína mburuvicha.  
 Juan A3-think Angela Merkel Germany boss pron.S.3-NOM Argentina boss

'Juan thinks that Angela Merkel, the German president, is the Argentinian president.'

Since the resulting utterance is acceptable in Guarani, we conclude that appositives do not have Local Effect, i.e. can contribute their content to the global context only (like their English counterparts). The same is true for Guarani expressives; see also Potts (2007) and references therein for the observation that expressives do not contribute to the local context.

Subdiagnostic III. of the Local Effect diagnostic in (41) differs from subdiagnostic II. in the way the context is controlled. We illustrate the application of this subdiagnostic with the third person pronoun *ha'e* with respect to the human implication in (50a). Since the pronoun is associated with a Contextual Felicity constraint with respect to the existence implication, the global context in which the utterance that contains the (bold-faced) pronoun is interpreted entails the existence of an entity, as does the local context (Malena's epistemic state). Crucially, the entity is inanimate in the local context since Malena thinks it is a stone figure.

- (50) a. (*Context*) The speaker, Ricardo and Malena are lost and looking for somebody to ask for directions. The speaker, who is walking ahead with Ricardo, says:

E-ma'ẽ-mi! Upépe o-ĩ peteĩ kuimba'e, há=katu Maléna nd-oi-kuáa-i.  
 A2sg-look-DIM there A3-be one man and=CONTRAST Malena NEG-A3-know-NEG  
 Ha'e oi-mo'ã **ha'e-ha** peteĩ ta'anga ita-guí-gua.  
 pron.S.3 A3-think pron.S.3-NOM one figure stone-of-from

'Look! There's a man over there, but Malena doesn't know that (it's a man). She thinks he is a stone figure.'

The fact that the consultants judge this (and utterances like it) acceptable is evidence that the implication of *ha'e* that its referent is human does not need to have its effect locally. Additional support for this conclusion is the unacceptability of example (50b), where the complement clause of (50a) is realized as a matrix clause: (50a) would be unacceptable if the human implication had to be interpreted locally.<sup>22</sup>

- (50) b. (*Context*) The speaker is standing in front of a stone figure.

#**Ha'e** peteĩ ta'anga ita-guí-gua.  
 pron.S.3 one figure stone-of-from  
 (Intended meaning: It's a stone figure.)

(51) illustrates an application of the Local Effect diagnostic to the implication of demonstrative noun phrases that the demonstratum has the property denoted by the noun. (We note that only two of the three consultants we worked with on such examples systematically accepted them.) This example also shows that indication implications of demonstrative noun phrases do not have Local Effect: Malena does not need to think that the speaker of (51) is indicating something (namely Raul). (52) is another example that shows that the indication implication does not have Local Effect: Sabina does not need to think that the speaker of (52) is indicating something.

<sup>22</sup>The utterance in (i) with the non-attributive demonstrative pronoun *kóva* would be used in this context.

- (i) **Kóva** peteĩ ta'anga ita-guí-gua.  
 this one figure stone-of-from  
 'This is a stone figure.'

- (51) (*Context*) The speaker and her addressee are at a reception, with Raul standing at the next table. Malena is not present.

Raul mburuvicha há=katu      Maléna nd-oi-kuáa-i.      Ha'e      oi-mo'ã **ko mburuvicha**  
 Raul boss      and=CONTRAST Malena NEG-A3-know-NEG pron.S.3 A3-think this boss  
 pa'i-ha.  
 priest-NOM

'Raul is a (company) boss, but Malena doesn't know that. She thinks this boss is a priest.'

- (52) (*Context*) Marko and Maria are walking down the street together when Marko points at a house; their school friend Sabina is not with them.

Sabína oi-mo'ã ai-ko      **pe óga-pe.**  
 Sabina A3-think A1sg-live that house-in

'Sabina thinks that I live in that house.'

### 5.3 Summary

In sum, projective contents differ in whether or not they are necessarily contributed locally: the existence implication of the pronoun *ha'e* and the polar implication of *aimete* 'almost', for example, have Local Effect, while the descriptive content of appositives and the human implication of the pronoun *ha'e* do not. The full results of applying the diagnostics for Local Effect are summarized in Table 2 in section 7.

## 6 Class D projective contents

The previous sections have identified one implication in class D, i.e. that is associated with a strong Contextual Felicity requirement, but does not have Local Effect, namely the indication implication of Guaraní demonstrative noun phrases. The data in (53a) to (53c) illustrate that the requirement associated with indexical English expression like *that car* that something is being indicated by the speaker exhibits the same properties. The infelicity of (53a) shows that there is a strong Contextual Felicity requirement to the effect that the speaker is indicating a car; the infelicity of (53b) shows that this requirement survives embedding from the antecedent of a conditional, and hence is projective; and the consistency of (53c) shows that the implication that the speaker is indicating something does not have a Local Effect.

- (53) a. (*Context*) Barney and Fred are walking down the street. They haven't been discussing cars. Barney does not point to or otherwise indicate any of the cars parked in the street. Barney says:  
 # Wilma likes that car.
- b. Same context as in (53a):  
 #If Wilma likes that car, she has good taste.
- c. (*Context*) Barney points at a car and says:  
 Pebbles thinks Wilma likes that car, but of course Pebbles has no idea that I'm pointing to it.

Are there other such projective contents for which there is a strong Contextual Felicity requirement, but no Local Effect? As we will argue, the answer is very clearly yes, but the issue is complicated by the fact that the implications in question are often hard to state straightforwardly, and hard to disentangle from other implications that may fall into different classes. Specifically, the Class D implications that we will now discuss tend to concern not facts about the external world which the interlocutors seek to describe, but facts about the discourse situation itself. It is for this reason that class D implications, at least the ones we have

examined, are particularly demanding to study in a fieldwork situation. Therefore from an empirical point of view, and although we present some preliminary results from the field, the reader might reasonably take the current section not as pinning down robust and reliable methods for studying class D implications, but rather as presenting what is to us a quite tantalizing new area of research, an area in which we hope we will inspire future study.

Let us start with Kripke's classic observation that the additive particle *too* must be associated with something more than a merely existential presupposition. He notes that for example (54), the putative existential presupposition that someone other than Sam is having dinner in New York is surely satisfied, and that even so the example would be highly marked in a situation where the interlocutors had not explicitly exchanged information about some other individual having dinner in New York.

- (54) Sam is having dinner in New York tonight, too. (Kripke 2009)

We take the oddity of (54), and comparable Guaraní examples discussed in section 3, to show that it is associated with a strong Contextual Felicity requirement. Given that the existential claim that someone other than Sam is having dinner in New York can reasonably be taken to be in the common ground of the interlocutors, the Contextual Felicity requirement must be of a different nature: we suggest (adapting from Kripke and others) that it is the constraint that there is a *salient* established proposition to the effect that someone (other than Sam) is having dinner in New York. Furthermore, it is easily shown that this is a projective implication, though we omit presentation of the arguments here. We are more interested in the question of whether the salience implication has Local Effect.

Consider (55). Here the Contextual Felicity requirement on salience is satisfied. In this example, the 'Kripke sentence', i.e. (54), is embedded under the attitude verb *think*. Crucially, it is made clear that the bearer of the attitude, Jane, should not be aware of the utterance. Clearly there is no implication that Jane thinks that a certain proposition, e.g. the proposition that Mary is having dinner in New York, is salient in the utterance context, since Jane doesn't know anything about the utterance context, and need not have any particular beliefs about what is salient in the minds of the interlocutors. It follows that the salience implication does not have a Local Effect, and thence that this implication is a Class D projective content.

- (55) Mary's having dinner in New York tonight, and, Jane thinks Sam is having dinner in New York tonight, too. Coincidence? I don't think so! But don't let Jane know that I told you about Mary or Sam's dinner plans, or she'll say I'm being a gossip.

Just as for English additives, Guaraní *avei* 'too' has at least some projective implications that lack a Local Effect. In example (56), an additive is embedded under an attitude. Consider the implication that there is a salient true proposition concerning someone other than Carlos, and saying of that individual that they are drunk. This is satisfied contextually by the prior claim that Claudia is drunk. But a hearer will not infer that Brian thinks that this proposition is salient, or indeed that Brian has any particular knowledge of the conversation between Susi and Maria or knowledge of what is salient for them.

- (56) (*Context*) Brian and Carlos are at a party. There are lots of drunk people there. Susi is worried about her friend Claudia. She says to Maria:

Claudia o-ka'u ha Brian oi-mo'ã Carlos **avei** o-ka'u-ha.  
Claudia A3-drunk and Brian A3-think Carlos too A3-drunk-NOM

'Claudia is drunk and Brian thinks that Carlos, too, is drunk.'

We note here that although it is clear that additive particles have at least some implications which lack Local Effect, it remains controversial exactly which implications associated with additives have a Local Effect. Consider this much discussed example due to Heim:

- (57) (Context) Two kids are talking to each other on the phone. (Heim 1992:209)  
 John: I<sub>1</sub> am already in bed.  
 Mary: My parents think I<sub>F</sub> am **also**<sub>1</sub> in bed.

Heim's claim is that Mary's utterance does not imply that her parents believe that John (or any other specific individual other than Mary) is in bed. It is unclear to us whether Mary's utterance in (57) is felicitous, but judgments are much sharper with respect to (58a) and (58b), both of which are strikingly infelicitous.

- (58) a. (Context) Two kids are talking to each other on the phone.  
 John: I<sub>1</sub> am already in bed.  
 Mary: # My parents think I<sub>F</sub> am **also**<sub>1</sub> in bed but that you aren't.  
 b. (Context) Two kids are talking to each other on the phone.  
 John: I<sub>1</sub> am wearing the PJs that you left behind last time we had a sleepover.  
 Mary: # My parents think I<sub>F</sub> am **also**<sub>1</sub> wearing those PJs.

Our judgments on (58a) and (58b) are in agreement with Guaraní data in (46a) above, implying that additives are associated with at least some implication that has a Local Effect, and implying that this implication must be at least as strong as an existential. A position consistent with the data we have collected is that, in addition to their Class D salience implication, additives are associated with a Class A projective implication that includes both existence of another individual satisfying the relevant predication, and the possibility that the actual antecedent in the discourse is true. Thus in (57), Mary's utterance would require (a) that Mary's parents thought someone else was in bed, and (b) that Mary's parents thought it possible that John was in bed. While consistent with the data, such a position is *ad hoc*, and we leave open for future research a fuller listing of the projective implications associated with additives, and a thorough study of how those implications can be separated cleanly from each other for empirical study and classification.

Another candidate for Class D projective implications may be a more generalized version of the implications associated with additives, namely the implication resulting from focus to the effect that alternatives are salient. It is well established that in English, strong intonational stress is only felicitous in very limited discourse contexts. Thus, for example, (59) would be felicitous if the sentence followed an earlier question "Who called Fred?", but not if it followed "Who did Wilma call?", to which it is not *congruent*.

- (59) WILMA called Fred.

We suggest that the implication that alternatives are salient is a strong candidate for Class D implication. First, the oddity of (59) out of the blue suggests that there is a Contextual Felicity constraint. Second, it is clear that this implication projects, since (60a), in which clause with a focused constituent is embedded in the antecedent of a conditional, places similar requirements as regards the salience of alternatives of the form "X called Fred" as does (59). Third, in (60b) there is no implication from Barney's utterance to the effect that Pebbles thinks it is salient (to Betty and Barney) who called Fred, or even that Pebbles is aware of other alternatives.

- (60) a. If WILMA called Fred, that would explain a lot.  
 b. Betty: I'm wondering who called Fred.  
 Barney: Pebbles thinks that WILMA called him.

While we leave detailed exploration of these subtle discourse oriented implications for future work, we nonetheless tentatively include them in Table 2 in the next section, which summarizes our findings about projective contents in English and Guaraní.

## 7 Projective content in English and Paraguayan Guarani

The results of applying the diagnostics for Contextual Felicity, Projection and Local Effect are summarized in Table 2 for pairs of English (E) and Guarani (G) triggers and contents. The third column identifies the various contents as projective; the fourth and fifth columns identify whether a trigger/content pair has the Contextual Felicity or Local Effect properties (yes) or not (no). The final column identifies the four classes of projective contents that empirically emerge from the application of these diagnostics.

Language	Trigger/Content	Property			Class
		Projection	Contextual Felicity	Local Effect	
E	Pronoun/existence of referent	yes	yes	yes	A
	<i>too</i> /existence of alternative	yes	yes	yes	
	<i>ha'e</i> '3rd'/existence of referent	yes	yes	yes	
	<i>avei</i> 'too'/existence of alternative	yes	yes	yes	
G	Expressive	yes	no	no	B
	Appositive	yes	no	no	
	NRRC	yes	no	no	
	Expressive	yes	no	no	
	Appositive	yes	no	no	
	NRRC	yes	no	no	
	<i>ha'e</i> '3rd'/human referent	yes	no	no	
	Demonstrative NP/property attribution	yes	no	no	
E	<i>almost</i> /polar implication	yes	no	yes	C
	<i>only</i> /prejacent implication	yes	no	yes	
	<i>stop</i> /pre-state holds	yes	no	yes	
	Possessive NP/possessive relation	yes	no	yes	
G	<i>aimete</i> 'almost'/polar implication	yes	no	yes	
	( <i>oi</i> ) <i>kuaa</i> 'know'/content of complement	yes	no	yes	
	– <i>nte</i> 'only'/prejacent implication	yes	no	yes	
	<i>nda</i> -...- <i>vé-i-ma</i> 'not anymore'/pre-state holds	yes	no	yes	
	Possessive NP/possessive relation	yes	no	yes	
E	<i>too</i> /salience of established alternative	yes	yes	no	D
	Focus/salience of alternatives	yes	yes	no	
	<i>that</i> N/speaker indicates suitable entity	yes	yes	no	
G	<i>avei</i> 'too'/salience of established alternative	yes	yes	no	
	Demonstr. NP/speaker indicates suitable entity	yes	yes	no	

Table 2: Properties of some projective contents in English and Paraguayan Guarani

We hypothesize that the Projection, Contextual Felicity and Local Effect properties delineate theoretically cohesive classes of projective contents in the two languages. The projective contents summarized in Table 2 fall into four classes: Triggers of projective contents in both classes A and D impose a Contextual Felicity constraint with respect to the relevant content, but while the contents in class A have Local Effect, those in class D do not. The contents in classes B and D are not associated with a Contextual Felicity constraint, but while the contents in class B do not necessarily have a Local Effect, those in class C do.

These classes of projective content, which empirically emerge from the application of diagnostics for Contextual Felicity and Local Effect, align with theoretically identifiable classes of projective contents. The Contextual Felicity constraint can be taken to reflect an anaphoric requirement imposed by a trigger

on the context; thus, triggers of projective contents in our classes A and D are expressions typically called anaphoric, including pronouns, demonstrative noun phrases and the adverb *too* (and its Guaraní counterpart). The contents in class B subsume Potts' Conventional Implicatures, but also include some of the projective contents contributed by pronouns and demonstrative noun phrases. Our research suggests that a particular lexical item can give rise to several (projective) implications with distinct status: for example, in the case of the third person pronoun *ha'e*, we have evidence that it gives rise to both a class A and a class B projective content (and, the discussion of salience in section 6 suggests that pronouns might also be associated with class D implications). With anaphoric triggers, the descriptive content implication thus need not be anaphoric. The set of projective implications in class C are perhaps the most heterogeneous of the classes and we anticipate further subdivisions by considering additional properties of projective contents. Classical presuppositions, such as those triggered by *stop* and *know* (and their Guaraní counterparts) are contained in this class, but also possessive noun phrases (with respect to the attribution of the possession relation) and the prejacent of *only* (and Guaraní *-nte*), which is not clearly presuppositional in the classical sense (see e.g. Horn 1996; Roberts 2006; Beaver and Clark 2008 for discussion).

One notable property of the taxonomy in Table 2 is that there is a significant overlap of the triggers for which we have identified Class A and class D implications, and that the implications themselves are closely related in these cases. It might therefore be hypothesized that as regards classification of expression types (rather than classification of individual projective implications), there are in fact three classes rather than four, with (as hinted at earlier in the paper) Class A and D implications arising from a single class of anaphoric and indexical expressions.

Table 2 allows for a comparison between English and Guaraní that reveals many parallels between projective contents in the two languages. The three subclasses of projective contents are populated by expressions from the two languages and, more importantly, there is significant overlap in the properties of the projective contents of comparable expressions: for example, the content of expressives is projective in both languages, is not associated with a Contextual Felicity constraint and does not have Local Effect. Likewise, the prejacent implications of Guaraní *-nte* 'only' and English *only* are projective in the two languages, not associated with a Contextual Felicity constraint, but must have their effect locally. The only differences conclusively established so far pertain to variation in the inventory of triggers of projective contents. For example, English, but not Guaraní, has definite noun phrases, which trigger anaphoric projective implications (e.g. Roberts 2003). English third person pronouns like *she* and *he* give rise to gender implications, while the Guaraní third person pronoun *ha'e* only requires its referent(s) to be human. As discussed in section 3, the question of whether possessive noun phrases, change of state constructions and the verb (*oi*)*kuaa* 'know' in English and Guaraní differ with respect to a Contextual Felicity constraint is a question for future research.

## 8 Implications for theories of projection

In the introduction to this paper, we observed that projection has largely been treated as a property of presuppositions, and has primarily been explored from this perspective. The evidence we have presented confirms that projection does not, in fact, pick out the traditional class of presuppositions in English or Guaraní. In fact, none of the four classes of projective content identified above encompass the contents traditionally considered presuppositions. The evidence presented above minimally suggests that the classes of projective content A, B, C and D form a subtaxony in a better-developed taxonomy of meaning and are distinct on some dimension from e.g. ordinary entailments. How this subtaxony would fit into a taxonomy of meaning is a question for future research.

The observation that projective contents are heterogeneous (see also e.g. Chierchia and McConnell-Ginet 1990; Abusch 2002, 2010; Simons 2001; Potts 2005, 2007; Abbott 2006) has important implications for theories of projection. We argue that a principled theory of projection that accounts for all classes of projective content should, if attainable, be preferable to a collection of disparate theories which individually account

only for subsets of projection phenomena. Consider, for example, accounts of projection based on the assumption that presuppositions place constraints on the context: on these accounts, presupposition projection occurs when this constraint is required (for one reason or another) to be satisfied outside of the local context in which the trigger occurs (Karttunen 1974; Heim 1983; van der Sandt 1992; Geurts 1999). Since only projective implications in classes A and D are associated with a Contextual Felicity constraint, these accounts of projection cannot easily generalize to implications in classes B and C that are not associated with such a constraint. A similar objection can be raised against even more recent models, like that of Schlenker (2009), where it is assumed that a presupposition is satisfied in its local context if it is entailed by it. Since, in general, the relevant local context is the context set (“which encodes what the speech act participants take for granted”, p.2), presuppositions are predicted to project. The heterogeneity of projective contents, in particular the finding that many such contents are not associated with a Contextual Felicity constraint, provides an argument against an inclusive analysis of projection based on local satisfaction.

In theories like those of Karttunen and Peters (1979) and Potts (2005, 2007), projective content is not targeted by entailment-canceling operators because projective content is handled in a separate dimension from ordinary content and is thus not accessible to such operators (see also Jayez 2009 for a related account). As discussed in detail in Amaral et al. (2007), such multi-dimensional theories of meaning are problematic since they cannot account for observed anaphoric interactions between the different kinds of content (see also Lee 2011 for discussion). A further problem for such analyses is that whether a particular content is projective is context-dependent (Simons et al. 2010), a fact that is not captured by analyses that assume that projective content is conventionally specified as such.

Schlenker (2007) proposes to capture the projectivity of expressive contents, one of the types of content considered by Potts (2005), by arguing that such contents are ‘informative self-fulfilling presuppositions’. Expanding on Stalnaker (2002), the assumption is that since the speaker presents herself as presupposing that  $p$ , the other speech act participants update their beliefs to take into account the speaker’s belief, thus guaranteeing that  $p$  is common belief and projective. But, as noted in Schlenker (2007:243), this process crucially relies on the relevant content being “indexical and attitudinal, and thus predication[ing] something of the speaker’s mental states”. It is unclear, however, whether all projective contents have these properties.

We return, then, to the position proposed in the introduction to this paper: a fully adequate account of projection must be based on a detailed understanding of the empirical behaviors of projective contents. This paper constitutes a contribution to that understanding.

In sum, we have proposed a preliminary taxonomy of projective content on the basis of a detailed exploration of a wide range of projective contents in English and Guaraní. Projection is a property common to all contents considered here, whereas Contextual Felicity and Local Effect point to the heterogeneity of the set of projective contents. The application of the diagnostics for these properties has shown that Guaraní has expressions that give rise to projective contents and that comparable expressions in English and Guaraní exhibit striking parallels with respect to the kind of projective content they convey. The current taxonomy already has strong implications for the taxonomy of meaning and theories of projection, implying classifications which cross-cut the traditional notion of presupposition, which in turn suggests that existing accounts of projection be revised so as to account uniformly for presuppositional and non-presuppositional projective contents. We expect (and hope) that future research on projective contents in other languages on the basis of the diagnostics developed here will lead to further refinements of the taxonomy we have proposed.

## References

- Abbott, Barbara. 2006. Where have some of the presuppositions gone? In B. J. Birner and G. Ward, eds., *Drawing the Boundaries of Meaning: Neo-Gricean Studies in Pragmatics and Semantics in Honor of Laurence R. Horn*, pages 1–20. Philadelphia: John Benjamins.
- Abusch, Dorit. 2002. Lexical alternatives as a source of pragmatic presupposition. In *Proceedings of*

- Semantics and Linguistic Theory (SALT) XII*, pages 1–19. Ithaca, NY: CLC Publications.
- Abusch, Dorit. 2010. Presupposition triggering from alternatives. *Journal of Semantics* 27:37–80.
- Acosta, Feliciano and Natalia Krivoshein de Canese, eds. 2003. *Mombe’ugua’u: colección de mitos, fábulas y leyendas paraguayas*. Asunción, Paraguay: Servilibro.
- Acosta Alcaraz, Feliciano and Tadeo Zarratea, eds. 2003. *Ka’i rembiasakue (Las aventuras de ca’i)*. Asunción, Paraguay: Servilibro. Spanish translations by Natalia Krivoshein de Canese.
- Adelaar, Willem F. H. 1994. The nasal/oral distinction in Paraguayan Guaraní suffixes. *Revista Latinoamericana de Estudios Etnolingüísticos* 8:125–133.
- Amaral, Patrícia Matos, Craige Roberts, and E. Allyn Smith. 2007. Review of ‘The Logic of Conventional Implicature’ by Chris Potts. *Linguistics and Philosophy* 30:707–749.
- Beaver, David. 2001. *Presupposition and Assertion in Dynamic Semantics*. Stanford, CA: CSLI Publications.
- Beaver, David and Brady Clark. 2008. *Sense and Sensitivity: How Focus Determines Meaning*. Oxford: Wiley-Blackwell.
- Chemla, Emmanuel. 2009. Presuppositions of quantified sentences: Experimental data. *Natural Language Semantics* 17:299–340.
- Chierchia, Gennaro and Sally McConnell-Ginet. 1990. *Meaning and Grammar*. Cambridge, MA: MIT Press.
- Clopper, Cynthia G. and Judith Tonhauser. 2011. On the prosodic coding of focus in Paraguayan Guaraní. In *Proceedings of the 28th West Coast Conference on Formal Linguistics (WCCFL)*, pages 249–257. Somerville, MA: Cascadilla Proceedings Project.
- Clopper, Cynthia G. and Judith Tonhauser. ms. The prosody of focus in Paraguayan Guaraní. Unpublished ms, June 2011, The Ohio State University.
- Dessaint, Michel. 1996. Mba’éixapa he’i ara avañe’ëme (comment dit-on le temps en guarani?). *Modèles linguistiques* 33(XVII):9–17.
- von Fintel, Kai and Lisa Matthewson. 2008. Universals in semantics. *The Linguistic Review* 25:139–201.
- Gazdar, Gerald. 1979. *Pragmatics: Implicature, Presuppositions, and Logical Form*. New York: Academic Press.
- Geurts, Bart. 1999. *Presuppositions and pronouns*. Oxford: Elsevier.
- Geurts, Bart, Napoleon Katsos, Chris Cummins, Jonas Moons, and Leo Noordman. 2010. Scalar quantifiers: Logic, acquisition, and processing. *Language and Cognitive Processes* 25:130–148.
- Geurts, Bart and Rob van der Sandt. 2001. Too. In *Proceedings of the 13th Amsterdam Colloquium*, pages 180–185. University of Amsterdam.
- Gregores, Emma and Jorge A. Suárez. 1967. *A Description of Colloquial Guaraní*. The Hague: Mouton de Gruyter.
- Grice, Paul. 1975. Logic and conversation. In P. Cole and J. Morgan, eds., *Syntax and Semantics 3: Speech Acts*, pages 64–75. New York: Academic Press.
- Heim, Irene. 1982. *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. thesis, University of Massachusetts, Amherst.
- Heim, Irene. 1983. On the projection problem for presuppositions. In M. Barlow, D. Flickinger, and M. Westcoat, eds., *West Coast Conference on Formal Linguistics 2*, pages 114–125.
- Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:183–221.
- Horn, Lawrence R. 1996. Exclusive company: Only and the dynamics of vertical inference. *Journal of Semantics* 13:1–40.
- Horn, Laurence R. 2002. Assertoric inertia and NPI licencing. In *Proceedings of the 38th Annual Meeting of the Chicago Linguistic Society: Parasession on Negation and Polarity*, vol. 38, pages 55–82.
- Jayez, Jacques. 2009. Projective meaning and attachment. In *Proceedings of the 17th Amsterdam Colloquium*, pages 1–19. Ithaca, NY: CLC Publications.

- quium*, pages 306–315.
- Karttunen, Lauri. 1974. Presupposition and linguistic context. *Theoretical Linguistics* 1:181–193.
- Karttunen, Lauri and Stanley Peters. 1979. Conventional implicature. In C. Oh and D. Dineen, eds., *Presuppositions*, Syntax and Semantics Vol.11, pages 1–56. New York: Academic Press.
- Kripke, Saul A. 2009. Presupposition and anaphora: Remarks on the formulation of the projection problem. *Linguistic Inquiry* 40:367–386.
- Krivoshein de Canese, Natalia, Carlos Martínez Gamba, and Feliciano Acosta Alcaraz, eds. 2005. *Tetāgua Remimombe'u: Cuentos Populares Paraguayos*. Asunción, Paraguay: Servilibro.
- Langendoen, Terry and Harris Savin. 1971. The projection problem for presuppositions. In C. Fillmore and T. Langendoen, eds., *Studies in Linguistic Semantics*, pages 54–60. New York: Holt, Rinehart and Winston.
- Lee, Jungmee. 2011. *Evidentiality and its Relationship to Temporality and Modality*. Ph.D. thesis, The Ohio State University.
- Levinson, Stephen. 1983. *Pragmatics*. Cambridge: Cambridge University Press.
- Levinson, Stephen. 2011. Universals in pragmatics. In P. C. Hogan, ed., *The Cambridge Encyclopedia of the Language Sciences*, pages 654–657. New York: Cambridge University Press.
- Levinson, Stephen C. and E. Annamalai. 1992. Why presuppositions aren't conventional. In R. N. Srivastava, ed., *Language and Text: Studies in Honour of Ashok R. Kelkar*, pages 227–242. Delhi: Kalinga Publications.
- Lewis, David. 1979. Scorekeeping in a language game. In R. Bäuerle, U. Egli, and A. von Stechow, eds., *Semantics from Different Points of View*, pages 172–187. Berlin: Springer Publishing House.
- Liuzzi, Silvio. 1987. *Temps et Aspect en Guaraní*. Ph.D. thesis, Université de Paris IV, Sorbonne.
- Liuzzi, Silvio and Pablo Kirtchuk. 1989. Tiempo y aspecto en Guaraní. *Amerindia* 14:9–42.
- Lunt, Horace G. 1973. Remarks on nasality: The case of Guaraní. In S. R. Anderson and P. Kiparsky, eds., *A Festschrift for Morris Halle*, pages 131–139. New York: Holt, Rinehart and Winston, Inc.
- Matthewson, Lisa. 2004. On the methodology of semantic fieldwork. *International Journal of American Linguistics* 70(4):369–415.
- Matthewson, Lisa. 2006. Presupposition and cross-linguistic variation. In *Proceedings of the 26th Meeting of the North-Eastern Linguistic Society*, pages 63–76.
- Ministerio de Educación y Cultura. 2004. La educación bilingüe en la reforma educativa Paraguaya. Available online at [www.escuelaviva-mec.edu.py/investigaciones/60.pdf](http://www.escuelaviva-mec.edu.py/investigaciones/60.pdf), last checked 08/30/08.
- Nordhoff, Sebastian. 2004. *Nomen/Verb-Distinktion im Guaraní*. Master's thesis, University of Cologne, Germany.
- Potts, Christopher. 2005. *The Logic of Conventional Implicatures*. Oxford: Oxford University Press.
- Potts, Chris. 2007. The expressive dimension. *Theoretical Linguistics* 33:165–197.
- Rivas, Alberto M. 1974. Nasalization in Guaraní. In E. Kaisse and J. Hankamer, eds., *North Eastern Linguistic Society (NELS) 5*, pages 134–143. Cambridge, MA: Harvard University.
- Roberts, Craige. 1989. Modal subordination and pronominal anaphora in discourse. *Linguistics and Philosophy* 12:689–721.
- Roberts, Craige. 1995. Domain restriction in dynamic semantics. In E. Bach, E. Jelinek, A. Kratzer, and B. H. Partee, eds., *Quantification in Natural Languages*, pages 661–700. Dordrecht: Kluwer.
- Roberts, Craige. 2003. Uniqueness in definite noun phrases. *Linguistics and Philosophy* 26(3):287–350.
- Roberts, Craige. 2004. Context in dynamic interpretation. In L. Horn and G. Ward, eds., *Handbook of Contemporary Pragmatic Theory*, pages 197–220. Oxford: Blackwell.
- Roberts, Craige. 2006. *Only*, presupposition and implicature. Accepted with revisions for *Journal of Semantics*.
- Schlenker, Philippe. 2007. Expressive presuppositions. *Theoretical Linguistics* 33:237–245.
- Schlenker, Philippe. 2009. Local contexts. *Semantics & Pragmatics* 2:1–78.

- Schwarz, Florian. 2007. Processing presupposed content. *Journal of Semantics* 24:373–416.
- Shain, Cory and Judith Tonhauser. 2010. The synchrony and diachrony of differential object marking in Paraguayan Guaraní. *Language Variation and Change* 22:321–346.
- Simons, Mandy. 2001. On the conversational basis of some presuppositions. In *Proceedings of Semantics and Linguistics Theory (SALT) XI*, pages 431–448. Ithaca, NY: CLC Publications.
- Simons, Mandy, Judith Tonhauser, David Beaver, and Craige Roberts. 2010. What projects and why. In *Semantics and Linguistic Theory (SALT) 21*, pages 309–327. Ithaca, NY: CLC Publications.
- Stalnaker, Robert. 1973. Presuppositions. *Journal of Philosophical Logic* 2:447–457.
- Stalnaker, Robert. 2002. Common ground. *Linguistics and Philosophy* 25:701–721.
- Stalnaker, Robert C. 1974. Pragmatic presuppositions. In M. Munitz and P. Unger, eds., *Semantics and Philosophy*, pages 197–213. New York: New York University Press.
- Tonhauser, Judith. 2006. *The Temporal Semantics of Noun Phrases: Evidence from Guaraní*. Ph.D. thesis, Stanford University.
- Tonhauser, Judith. 2007. Nominal tense? The meaning of Guaraní nominal temporal markers. *Language* 83(4):831–869.
- Tonhauser, Judith. 2009. Counterfactuality and future time reference: The case of Paraguayan Guaraní –mo’ā. In A. Riester and T. Solstad, eds., *Proceedings of Sinn und Bedeutung 13*, pages 527–541.
- Tonhauser, Judith. 2010. Is Paraguayan Guaraní a tenseless language? In *Proceedings of Semantics of Under-represented Languages of the Americas (SULA) 5*, pages 227–242. Amherst, MA: GLSA.
- Tonhauser, Judith. to appear a. The future marker –ta of Paraguayan Guaraní: Formal semantics and cross-linguistic comparison. In R. Musan and M. Rathert, eds., *Tense Across Languages*. Tübingen: Niemeyer.
- Tonhauser, Judith. to appear b. Temporal reference in Paraguayan Guaraní, a tenseless language. *Linguistics & Philosophy*.
- Tonhauser, Judith and Erika Colijn. 2010. Word order in Paraguayan Guaraní. *International Journal of American Linguistics* 76:255–288.
- van der Sandt, Rob. 1992. Presupposition projection as anaphora resolution. *Journal of Semantics* 9:333–377.
- Velázquez-Castillo, Maura. 1995. Noun incorporation and object placement in discourse: The case of Guaraní. In P. Downing and M. Noonan, eds., *Word Order in Discourse*, pages 555–579. Amsterdam/Philadelphia: John Benjamins.
- Velázquez-Castillo, Maura. 1996. *The Grammar of Possession: Inalienability, Incorporation and Possessor Ascension in Guaraní*. Amsterdam: John Benjamins.
- Velázquez-Castillo, Maura. 1999. Body-part EP constructions. In D. L. Payne and I. Barshi, eds., *External Possession*, pages 77–107. Amsterdam: John Benjamins.
- Velázquez-Castillo, Maura. 2002a. Grammatical relations in active systems. The case of Guaraní. *Functions of Language* 9(2):133–167.
- Velázquez-Castillo, Maura. 2002b. Guaraní causative constructions. In M. Shibatani, ed., *The Grammar of Causation and Interpersonal Manipulation*, pages 507–534. Amsterdam: John Benjamins.
- Velázquez-Castillo, Maura. 2004a. Guaraní (Tupí-Guaraní). In G. E. Booij, C. Lehmann, J. Mugdan, and S. Skopeteas, eds., *Morphology: An International Handbook on Inflection and Word-Formation*, vol. 2, pages 1421–1432. Berlin: Walter de Gruyter.
- Velázquez-Castillo, Maura. 2004b. Serial verb constructions in Paraguayan Guaraní. *International Journal of American Linguistics* 70(2):187–213.
- Walker, Rachel. 1999. Guaraní voiceless stops in oral versus nasal contexts: An acoustical study. *Journal of the International Phonetic Association* 29:63–94.
- Zeevat, Henk. 2000. Discourse particles as speech act markers. In *LDV Forum. Forum der Gesellschaft für Linguistische Datenverarbeitung (GLDV)*, vol. 17.1/2, pages 74–91.