

Presuppositions*

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“The collapsing of Strawson’s sleeping children into Stalnaker and Saddock’s lunch obviating sister, who herself metamorphoses into Grice’s aunt’s philharmonic cousin who in turn mutates into Burton-Roberts’ lunch-going sister should remind us that in the evolution of presupposition theory, all progress is relative.”

—Horn 1990:487

1 Introduction

What would it be like to speak a language without presuppositions? Is it even possible to have such a language, and if yes, would we want to speak it? Here is a game to try: let’s transcribe the fist sentence of the novel *Wuthering Heights* by Emily Brontë (1) into a text that does not contain expressions that are typically assumed to trigger presuppositions, cf. (2):

- (1) I have just returned from a visit to my landlord—the solitary neighbour that I shall be troubled with. (*Wuthering Heights*, Emily Brontë)

A first attempt at a presuppositionless transcription:

- (2) I have a unique landlord that I went to visit recently. He is a (solitary)¹ neighbour that I shall be troubled with and there is no other neighbour that I shall be troubled with. I am now at a location which is identical to where I was before I went to visit him.

An immediately visible result of this little exercise is that spelling out the presuppositions of various expressions creates a rather tedious text. I have assumed that the

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¹I am assuming *solitary* has a double meaning in this context: The sole (only) neighbour and also that this neighbour is solitary.

presuppositional expressions above are the verb *return from x* (which presupposes that its subject went to *x* at a previous time), the definite descriptions *my landlord*, *the neighbour* (which presuppose that there is a unique individual that the description refers to) and *solitary(=sole)* (which presupposes the clause that it modifies, and asserts an exhaustification of it). Just trying to spell out all these presuppositions creates a text that almost certainly no one would want to read any further. One reason for this tediousness is repetitions. There is something about presuppositions that helps package information in an efficient way.

In fact, the above paraphrase was based on a limited understanding of presuppositions that assigns them to a relatively small subset of the lexicon, also called conventional presupposition triggers (see an example list in Section 3.1). If we think of presuppositions as a broader category that encompasses sortal and compositional restrictions of lexical items (cf. Magidor 2013, Asher 2011) as well as bits of world knowledge and assumptions of conversational partners (aka. conversational presuppositions), a presupposition-free paraphrase becomes impossible. This is because the paraphrase has a problem of regression: any word that we use to explicate the sortal restriction of another word has sortal presuppositions itself and understanding our paraphrases require a significant amount of world knowledge and assumptions about our conversational partners as well. Here is thus a second (failed) attempt at paraphrasing (1):

- (3) I am an adult who has enough money to be able to rent a habitation from a landlord, of which I have exactly one. I am able to displace myself and I went to visit him recently. Having neighbours requires at least a certain amount of human interaction which I don't like. He is a (solitary) neighbour that I shall be dealing with and there is no other neighbour that I shall be dealing with. I am now at a location which is identical to where I was before I went to visit him.

Another irreducible and arguably presuppositional aspect of the above example is the interpretation of anaphors. One reason is the gender restriction on pronouns is commonly thought of as a presupposition on their use. But more importantly, the requirement that an anaphoric pronoun needs to be resolved to a suitable referent in the discourse is usually thought about as a presupposition on using the pronoun. However, spelling out the anaphoric component of pronouns results in metalinguistic statements (“a unique discourse referent of *he* can be found in some preceding discourse”):

- (4) I am an adult who (a unique referent of *who* can be found in some preceding discourse) has enough money to rent...

Thus it seems all but impossible to transform English into a language that does not use conversational and sortal presuppositions, or anaphoric pronouns. Eliminating certain conventional triggers such as change of state verbs, definite descriptions or focus particles from our language is perhaps manageable (though one might wonder about the possibility of eliminating some other conventional triggers, for example the factive verb *know* or discourse connectives; see Pavese 2020 for discussion of the latter) but at the cost of creating a highly tedious and cumbersome text. If we add the content of presuppositions to our sentences explicitly—to the extent that it is possible—we end up endlessly repeating bits of information.

Another aspect of the original example (1) that is lost in the paraphrases is the illusion of familiarity that Brontë creates between the reader and the protagonist. This illusion might be due to the requirement according to which the content of presuppositions should be already present in the common ground of the interlocutors at the time of uttering a presuppositional sentence (see discussion in the next section). When this is not the case, and there is no information that contradicts them in the common ground, presuppositions are thought to be accommodated, i.e. silently added to the common ground. Since (1) is the first sentence of a novel, there is no common ground between the reader and the narrator other than general world knowledge. But the use of presuppositions and the resulting accommodation process forces the reader to create one, which in turn produces an illusion of familiarity between the reader and the protagonist.

Presuppositions are an irreducible property of natural language use. They have a crucial role for creating coherent discourse, managing new and old information. They have a crucial role in keeping track of discourse referents, whether concrete or abstract. They have a crucial role in efficient information packaging at the lexical level: the way we fold concepts into words interacts fundamentally with presuppositions. They even have a crucial role in managing social interaction and bonding between conversational partners in dialogue.

This is why it is hard to find a topic in semantics and analytical philosophy that does *not* interact with presuppositions. The study of assertion (Schlöder, this volume), attitude ascriptions (Kratzer, this volume), argumentation (Pavese, this volume), definite descriptions (Coppock, Kamp, this volume), discourse structure (Hunter, this volume), indexicality, implicatures (Borg, this volume), modals (Mandelkern, this volume), perspective sensitivity (Anand and Toosarvandani, this volume), vagueness (Carter, this volume) and more... all interact crucially with presuppositions.

And yet, there is little agreement about what presuppositions are as a theoretical phenomenon, what are examples of it, whether it is one phenomenon or many different phenomena, how presuppositions arise, what the content of particular presuppositions is, and many other issues. Perhaps the only thing that everyone agrees about is that presuppositions project: the presuppositional inference can survive in contexts that are normally entailment-canceling: the so-called family of sentences test:

- (5) a. I doubt that Mr. Lockwood has returned from his visit.
 b. Has Mr. Lockwood returned from his visit?
 c. If Mr. Lockwood has returned from his visit, the lights should be on.
 all imply: Mr. Lockwood went for a visit.

The agreement ends there: why projection happens, why it shows the particular properties it does and what the fine-grained structure of the data is like is a matter of heated debates in both linguistics and philosophy. Indeed, the problem of explaining presupposition projection dominated the presupposition literature in the last 50 years leading to an abundance of projection theories that propose to explain the purported basic facts of projection.

Recently though, scholars have started addressing various questions in presupposition theory that are complementary to those asked by classical theories of projection: whether the presuppositions of various triggers show the same properties, why presuppositions arise to begin with (aka. the triggering problem) and whether contextual and linguistic

factors can influence presupposition projection and interpretation. After a discussion of major theories of what presuppositions are, this chapter overviews some of these recent developments. Unconventionally, I will not present in detail how the classic theories of presupposition predict the (alleged) projection facts (see Soames 1989, Heim 1990, Geurts 1999, Beaver 2001, Kadmon 2001, Potts 2015, Beaver and Geurts 2014, among others, for excellent overviews). Still, the conclusion I reach about presuppositions is valid for projection as well: it is complicated. Facts of presuppositions are the result of a dauntingly complex interplay of a number of lexical, contextual and extralinguistic factors and cannot be described by a simple beautiful formula one can print on a T-shirt.

2 What is presupposition?

2.1 One possibility: A precondition to meaning

The dominant school of thought treats the word ‘presupposition’ as a speaking name: Just as the name Holly Golightly betrays the nature of the character that bears it, the word ‘presupposition’ tells us that it has to do with pre-existing suppositions, i.e. information that speakers in a conversation take for granted. This information can be of many different types: it ranges from specific conditions attached to lexical items to aspects of general world knowledge and language use. The linguistic literature focuses mainly on the first type.

Understood as a precondition, presuppositions can be conceptualised as being a precondition for an expression to have a meaning in a given context (aka. semantic presupposition, Frege 1892, Strawson 1950) or as a precondition for using an expression (or a sentence) felicitously in a context (aka. pragmatic presupposition, Stalnaker 1972, 1973, 1974). Before I review these theories, let me add a few general observations. Although there is a debate in the literature about the true nature of presuppositions, often a mixed (or at least non-committed, agnostic) position is assumed by researchers. One reason is that the two notions do not exclude each other, and in fact some have argued that both kinds of presuppositions are real (cf. Keenan 1971, Shanon 1976). Second, there is no such thing as a purely semantic presupposition because even semantic presuppositions have a built in pragmatic component: they place a requirement on the discourse participants’ common ground and must be evaluated with respect to these.² This dual nature of semantic presuppositions is most explicit in the dynamic theories of Heim (1992) and van der Sandt (1992). A purely pragmatic theory is possible, in principle³ although even proponents of Stalnaker’s pragmatic view sometimes assume that semantic and pragmatic presuppositions can co-exist.⁴ In the latter case the relationship between the two types

²See discussion in Karttunen (1974) and Soames (1982), who define the notion of *utterance presupposition*, intended to capture this dual nature.

³“I think all of the facts can be stated and explained directly in terms of the underlying notion of speaker presupposition, and without introducing an intermediate notion of presupposition as a relation holding between sentences (or statements) and propositions” (Stalnaker 1974:50)

⁴“Since the whole point of expressing a proposition is to divide the relevant set of alternative possible situations — the presupposition set [the context set–MA] — into two parts, to distinguish those in which the proposition is true from those in which the proposition is false, it would obviously be inappropriate to use a sentence which failed to do this. Thus, that a proposition is presupposed by a sentence in the technical semantic sense provides a reason for requiring that it be presupposed in the pragmatic sense

of presuppositions is mediated by what came to be known as Stalnaker’s Bridge Principle which states that the presuppositions of a sentence expressing a partial proposition must be commonly accepted before the proposition expressed is evaluated and added to the common ground. Finally, depending on the particular presupposition at hand, one or the other approach might seem more appropriate, at least to some researchers. The clearest examples of pragmatic presuppositions are those that cannot be traced back to particular words or expressions but seem to result from the expectations of discourse participants; in contrast, conditions tied to particular lexical items are more often viewed as semantic.

Semantic presuppositions Let us zoom in on semantic theories of presuppositions, which come in many flavours. The basic idea is that presuppositions are part of the lexical meaning of certain words and constructions, called presupposition triggers. One of the most widespread version of this idea, to be traced back to Frege (1892) and Strawson (1950), assumes that presupposition triggers denote partial functions. For example, on a Strawsonian analysis of definite descriptions, the latter presuppose that there is a unique individual picked out by the description. A partial-function analysis captures this by stating that the domain of the function denoted by *the* is restricted to properties with a single member (in a given context). When this condition is not met, the function cannot be applied and the result is undefinedness, a catastrophic breakdown of semantic composition. As was noted by Potts (2015), presuppositions are ‘meta-properties of denotations’ on this view, which also captures why presuppositions are felt to be a precondition to word or sentence meaning.

Many important variants of the semantic view have been developed in the last fifty years or so. One well-known version uses trivalent logics, cf. Keenan (1972) and Karttunen (1973) for early examples. Partial functions associated with triggers are undefined when their presuppositions are not entailed by the context. This undefinedness is, implicitly, a third truth value associated with presupposition failure. Trivalent accounts make this third truth value explicit, cf. Beaver (2001), Beaver and Krahmer (2001), George (2008) for relatively recent discussions. Other important variants include supervaluationist theories of presuppositions (cf. van Fraassen 1969), and the dynamic semantic approach of Heim (1992), to which I come back below.

Pragmatic presuppositions Stalnaker (1972, 1973, 1974) worked out a theory of pragmatic (or speaker-) presuppositions. (cf. also Stalnaker 1998 for a more recent exposition). On this view, speakers presuppose things, not sentences. Presuppositions are information that the speaker believes to be part of the accepted common ground among the interlocutors. If a speaker presupposes that *p*, she believes that *p* is true and also that her interlocutors believe it to be true as well. Saying that a sentence has a presupposition *p*, on this view, is only a shorthand for saying that the sentence can be felicitously used only if the speaker presupposes the truth of *p*. Thus on this view presuppositions are constraints imposed by sentences on the context in which they are uttered, the relevant notion of context being the beliefs of the speaker and what they believe to be compatible with the common ground.

An important aspect of this proposal is that presupposition failure is not predicted whenever the sentence is used”, (Stalnaker 1973:452).

to lead to a catastrophic breakdown of communication. Second, this view allows for the possibility that certain (if not all) presuppositions arise due to general conversational principles or other pragmatic factors, instead of being hardwired into the meanings of particular words or expressions.

Note that Stalnaker's theory was part of a flourishing pragmatic trend in the 70's, inspired by Grice's pioneering work on pragmatics.⁵ Much of this thinking did not assume that presuppositions are preconditions; I discuss these theories in Section 2.3.

Dynamic approaches Heim (1983, 1992) introduced a dynamic version of the partial function approach: In this theory, sentences denote functions from contexts to contexts, but are defined only for contexts that entail their presuppositions. The idea that utterances can be viewed as functions that update the context is directly inspired by Stalnaker's theory of assertion and presupposition, and so is the assumption that presuppositions impose constraints on the context that is being updated by the assertion. But while in Stalnaker's theory assertions update the global context, Heim, following Karttunen's (1974) seminal work, proposes that the context is updated locally, i.e. the meanings of the subparts of a complex expression are added to the context step by step. Despite its conceptual closeness to pragmatic theories, Heim's theory is semantic in the sense that it relies on the idea that presuppositions are part of the lexical content of particular items, and as a result, become part of the conventional content of the clauses that contain these items.

Another major dynamic approach to presupposition is van der Sandt's (1992) anaphoric theory. Van der Sandt's idea is based on the observation that pronouns and presuppositions behave in a parallel fashion: Syntactic configurations in which pronouns can be interpreted anaphorically are also configurations in which presuppositions are felicitous and conversely, configurations in which pronouns are infelicitous are infelicitous for presuppositions as well. In order to capture this connection, he proposes that all presuppositions are anaphoric in the sense that they need to establish an anaphoric link to an element in the previous discourse that entails the content of the presupposition. However, when a presupposition is bound by some element in its local context, it does not need to find a discourse antecedent in the (global) context, in other words, it does not project. Note that although the anaphoric theory is conceptually similar to Heim's common ground theory, the empirical predictions of the two approaches are not the same, see Geurts (1999) for discussion.

Projection The idea that presuppositions are preconditions that the context needs to meet proved to be very fruitful for predicting projection facts; indeed most theories of presupposition projection on the market are based on this idea. Trivalent theories model projection via the trivalent truth tables for connectives, cf. Karttunen (1973), Beaver (2001), Beaver and Krahmer (2001), George (2008). The dynamic approach of Heim (1992) encodes projection properties in the lexical semantics (the context change potential) of the connectives. The anaphoric theory of van der Sandt (1992) derives projection facts from general rules of discourse for finding a suitable antecedent. Schlenker

⁵In Gazdar's (1979) theory presuppositions of a sentence need to be satisfied by the context that has been first updated with the entailments and the conversational implicatures of the sentence. Presuppositions that are incompatible with this updated context are canceled.

(2008, 2009) offer theories that attempt to derive the projection potential of connectives from pragmatic principles. See Beaver and Geurts (2014) for an overview.

2.2 Accommodation

A thorn in the side of the theory that views presuppositions as preconditions to meaning is the apparent ease with which we can utter sentences whose presuppositions are not entailed by the common ground of the speakers. For example the reader and the narrator clearly do not share the presuppositions of (1) at the time of uttering (or reading) the sentence. Yet (1) does not lead to a communicative breakdown, as would be predicted by the idea of presuppositions as preconditions to meaning. In fact, the sentence is easier to understand than its attempted presuppositionless variants.

There are two types of replies to this problem in the literature, sceptical and accommodating. Sceptics argue that the problem shows that the idea of treating presuppositions as preconditions is misguided cf. Burton-Roberts (1989), Gauker (1998), Abbott (2000). Others argue that the theory can be saved by assuming a repair mechanism, called presupposition accommodation. Below I briefly discuss the accommodating position, before coming back to the sceptical position in the next subsection.

An often quoted passage from Lewis (1979) suggests that presupposition accommodation is a magical process (see Abbott 2000), like some fairy in a tale that shows up to help just before a catastrophe is about to strike:

If at time t something is said that requires presupposition P to be acceptable, and if P is not presupposed just before t , then — *ceteris paribus* and within certain limits — presupposition P comes into existence at t . (Lewis 1979)

Defenders of accommodation argued that the process is not so mysterious once we think more carefully about what really happens when we use a sentence with a presupposition in context. Let us look at Stalnaker’s theory of presuppositions as speaker’s presuppositions. According to this theory, when a speaker A uses a sentence with a presupposition p , she needs to believe that p is true and that p is entailed by the common ground. Now suppose that A is wrong about p being in the common ground and B in fact does not believe that p is true. Then B , a competent speaker himself, will recognise the mistake and update his beliefs with ‘ A believes that p and that p is in the common ground’, and if A can be taken to be an authority on p or the content of p is uncontroversial he might even strengthen this to the belief that p . Moreover, if the speaker knows that the hearer will behave this way, she can knowingly use sentences whose presuppositions are not met in the common ground, as long as these presuppositions are uncontroversial. Stalnaker (2002) says: “if it is common belief that the addressee can come to know from the manifest utterance event both that the speaker is presupposing that φ , and that φ is true, that will suffice to make φ common belief, and so a presupposition of the addressee as well as the speaker.” (p.710)⁶ See also von Stechow (2008) and Thomason (1990) for discussion (among others).

⁶Immediately after, Stalnaker (2002) (p.710) acknowledges the importance of information structure though as well: “But it does not follow that this will suffice to make it appropriate for the speaker to say something that requires the presupposition that φ . There may be other constraints on appropriate assertion — other considerations that count in favor of stating that p rather than informing the addressee

If we accept that accommodation is a real pragmatic process, the question arises what and where to accommodate. As van der Sandt (1992), Beaver (2001), Beaver and Zeevat (2004) show, the global context is not necessarily the right place to accommodate, sometimes accommodation can happen into embedded positions. Once we spell out all the constraints on accommodation, it turns out that a full theory of accommodation is a projection theory in disguise. Finally, as was stressed by Kamp and Rossdeutscher (1994), when we look at real-life examples we often find that even in the case of a single presupposition the context entails some but not all of the presupposed information and in practice a mixture of presupposition verification and accommodation is needed to justify the use of a presuppositional expression.

2.3 Another possibility: A side-effect of information packaging

Grice's writings were a major inspiration behind Stalnaker's theory, but they also gave rise to a different strand of pragmatic-minded thinking on presuppositions. In a paper on definite descriptions, written in 1970 but published only in 1981, Grice argued that the implication of unique existence associated with 'The F is not G' should be seen as a conversational implicature because, just like other implicatures, it is non-detachable, cancellable and calculable. This idea gave rise to a number of neo-Gricean pragmatic accounts that tried to fully reduce the phenomenon of presupposition to conversational implicatures, using the maxims of relevance and quantity, e.g. Kempson et al. (1975), Wilson (1975), Atlas (1977, 1979), Atlas and Levinson (1981), Boër and Lycan (1976). More recent accounts close in spirit include Simons (2001, 2004, 2006, 2007) who argues for a conversational basis for presuppositions, as well as Chemla (2010) and Romoli (2015) who argue that certain presuppositions (namely of so called soft-triggers) are scalar implicatures.

In his 1981 paper, Grice also makes the following comment:

For instance, it is quite natural to say to somebody, when we are discussing some concert, *My aunt's cousin went to that concert*, when one knows perfectly well that the person one is talking to is very likely not even to know that one had an aunt, let alone know that one's aunt had a cousin. *So the supposition must be not that it is common knowledge but rather that [it] is noncontroversial*, in the sense that it is something that you would expect the hearer to take from you (if he does not already know). (Grice 1981: 190, emphasis mine)

The idea that presuppositions should present non-controversial information, rather than something that is in the common ground was directly imported into Atlas and Levinson's (1981) theory of presuppositions as implicatures. Non-controversiality also finds an echo

that p by manifestly presupposing it. A successful assertion may change the context in other ways than by simply adding its content to the context, for example by influencing the direction of the subsequent conversation. Suppose p is not something that the addressee will dispute, but that it is a noteworthy piece of information that the addressee might be expected to want to comment on. Then it might be inappropriate to convey the information in a way that keeps it in the background. An example of Kai von Fintel's illustrates the point: A daughter informs her father that she is getting married by saying "O Dad, I forgot to tell you that my fiancé and I are moving to Seattle next week". "

in Abbott’s (2000) view of presuppositions as non-assertions: if asserted information is up for discussion, then non-asserted information should be uncontroversial (see also Bezouidenhout 2010). In contrast to Grice and the neo-Griceans, Abbott (2000) does not attempt to reduce presuppositions to conversational implicatures, but assumes that presuppositions are a class of their own. Another approach that is related to the idea of presuppositions being non-controversial and non-asserted is found in Wilson and Sperber’s (1979) paper. They argue that the interpretation of an utterance involves a method of picking out and bringing to the forefront of attention the pragmatically most important entailments, on which the general relevance of the utterance depends. To achieve this, they propose that the semantic entailments of a sentence are ordered, based on syntactic form and relevance, into foregrounded and backgrounded⁷ entailments, the latter acting as presuppositions. Both Abbott (2000) and Wilson and Sperber (1979) thus assume that presuppositions arise as a result of constraints on information packaging: only a subset of the total information conveyed by the sentence can be its asserted/foregrounded content (aka its pragmatic main point), the rest (or at least a subset of the rest) is presupposed. Interestingly, this idea relates again to suggestions already made in Grice (1981) and Stalnaker (1974), who propose that using one short construction to assert two independent meanings should be pragmatically prohibited.⁸

For the accounts above, there is no infelicity in asserting informative presuppositions: For conversational implicatures, accommodation is the norm rather than the exception; and backgrounded/non-asserted information can (though does not have to) convey new information. Nevertheless, these theories were eclipsed by common ground theories because no precise projection theory with a wide empirical coverage was developed within these frameworks. Given the great number of highly successful common ground theories of projection, these came to dominate the field.

Nevertheless, recently there is a renewed interest in the idea of presuppositions as non-controversial/backgrounded/non-asserted or—with more recent terminology—*not-at-issue* material. One reason for this is the progress made in the understanding of different types of presupposition triggers (see discussion in the next section). In particular, it has been shown that the presuppositions of some presupposition triggers can be accommodated more easily than the presuppositions of other triggers (cf. Spenader 2002, Beaver and Zeevat 2007). This fact is surprising if accommodation is a run-of-the-mill pragmatic process: it should be easily available for the interpretation of any presuppositional content. These empirical differences have led some researchers to suggest that at least some presuppositions are genuinely informative (cf. e.g. Tonhauser 2015).

Second, although most detailed projection theories are formulated in the common-ground framework, some recent theories attempt to predict projection facts without the assumption that presuppositions need to be entailed by the common ground. For example, Simons et al. (2010) propose that not at-issue meanings project, where not at-issueness is understood as content that does not address the question under discussion in a given

⁷The term *backgrounded* should be understood here in terms of not being in the focus of attention, and not in the sense of being in the conversational background.

⁸Grice writes: “If your assertions are complex and conjunctive, and you are asserting a number of things at the same time, then it would be natural, on the assumption that any one of them might be challengeable, to set them out separately and so make it easy for anyone who wanted to challenge them to do so.” (Grice 1981:189).

context. A very different projection theory is proposed by Mandelkern (2016), who explicitly argues that presuppositions should not be thought of as constraints on input contexts, but rather as contents that are felt to be backgrounded.

A third reason is the growing interest in the problem of predicting why certain expressions trigger presuppositions, aka the triggering problem (cf. Simons 2001, Abusch 2002, 2010, Simons et al. 2010, Abrusán 2011 and discussion in the next section). Some of these accounts were inspired by an idea of Stalnaker (1974) who suggested that at least some presuppositions could be pragmatically derived based on considerations of efficient information packaging.⁹ Inspired by this, and also by Wilson and Sperber (1979) discussed above, some of the above cited authors assume that there is a principled way to split the total meaning of a sentence into backgrounded/foregrounded (at issue/not-at issue, etc.) meaning, thus predicting what part of the meaning gets presupposed. Though this not need not mean that presuppositions are not also subject to the common ground requirement (just as it did not mean this for Stalnaker, indeed some of the above-mentioned authors are agnostic on this issue), it gives a boost to the idea that they are (also) definable on information-packaging grounds.

The view that presuppositions can be defined solely as a side effect of information packaging faces a challenge though: If the characteristic property of presuppositions is that they are not at-issue (or backgrounded, non-controversial, etc.), then what distinguishes conventional implicatures, e.g. the nominal appositive *a confirmed psychopath* in (6), the from presuppositions?

- (6) The agency interviewed Chuck, a confirmed psychopath, just after his release from prison. (Potts 2005, p.114)

Some of the above-cited authors bite the bullet, and argue that there is no fundamental difference between presuppositions and conventional implicatures see e.g. Simons et al. (2010); Mandelkern (2016).¹⁰ Nevertheless, the question still remains what explains the empirical differences between presuppositions and conventional implicatures: for example presuppositions can be filtered out if their content appears in the antecedent of an *if*-clause, this is however not the case with conventional implicatures, cf. Potts (2005), Tonhauser et al. (2013) for discussion:

- (7) a. If Eddie has a dog, then his dog is a ferocious man-eater. (Potts 2005, p.112)
b. #If Chuck is a confirmed psychopath, then Chuck, a confirmed psychopath, has just been interviewed by the agency.

Another issue faced by these accounts is terminological: although properties such as

⁹Stalnaker (1974) writes: “It is clear that “x knows that P” entails that P. It is also clear that in most cases when anyone asserts or denies that x knows that P, he presupposes that P. Can this latter fact be explained without building it into the semantics of the word? I think it can. Suppose a speaker were to assert that x knows that P in a context where the truth of P is in doubt or dispute. He would be saying in one breath something that could be challenged in two different ways. He would be leaving unclear whether his main point was to make a claim about the truth of P, or to make a claim about the epistemic situation of x (the knower), and thus leaving unclear what direction he intended or expected the conversation to take.” As Abbott (2000) remarked, the reasoning given by Stalnaker for *know* can be recast in non-common ground theories.

¹⁰Abbott (2000) assumed that non-restrictive relative clauses, which are considered conventional implicatures by Potts 2005, introduce presuppositions.

backgrounded, non-asserted, not at-issue, non-controversial are intuitive, they are also highly ambiguous and not all authors use them in the same sense, which creates a certain amount of confusion in the literature.

2.4 Connection between the two views

The precondition and the information packaging views of presupposition are not incompatible with each other: it is possible that both are at play for defining some or all properties of presuppositions. There is also no necessary implication between backgrounded and given information: Backgrounded (not at-issue) information will often be contextually given (in the sense that it is satisfied in the (local) context or has a suitable antecedent that it can link to in the context), but it can also be new (as it is the case with Grice's aunt's cousin); and foregrounded information is typically new, but does not have to be (as in the case when my aunt's cousin repeats what she just said). As Abbott (2000) and Geurts (2017) remark: there might be a non-essential connection, in that backgrounding is most naturally construed as givenness.¹¹

3 Some recent developments and outstanding questions

There are many thorny issues in presupposition theory; this section presents a personal selection. I discuss whether all presuppositions are the same and if not, whether we can establish different classes of them. Second, I present some recent attempts at explaining why we have presuppositions in the first place, aka the triggering problem. Third, I give an overview of various linguistic and pragmatic factors that influence projection and the interpretation of presuppositions, and discuss the challenges these facts pose for projection theories. Finally, I briefly comment on the problem of presupposition projection from the scope of attitude verbs.

3.1 Types of triggers

Linguists and philosophers have studied diverse examples of presupposition triggers since Frege, often not making the connection between the observed facts. An 'official' list of 13 classes of presupposition triggers, based on unpublished work by Karttunen, was popularised in Levinson (1983). Updated versions of this list can be found in most overviews of presupposition. Here is a list from Beaver (1997):

- (8) a. Definite NPs (presuppose the existence of their referent, and perhaps also uniqueness; includes proper names, possessives, 'this'- and 'that'-clauses, and wh-phrases)
- b. Quantificational NPs (presuppose the existence of a non-trivial domain)
- c. Factive verbs and NPs (presuppose the truth of the propositional complement)
- d. Clefts (an it-cleft 'it was x that y-ed' presupposes that something 'y-ed')

¹¹See also the theories outlined in Asher et al. (2007) and Bittner (2001, 2007) for connecting backgroundedness and givenness.

- e. Wh-questions (presuppose existence of an entity answering the question, or speakers expectation of such an entity)
- f. Counterfactual conditionals (presuppose falsity of the antecedent)
- g. Intonational Stress ('X y-ed' with stressed 'X' might presuppose that somebody 'y-ed')
- h. Sortally restricted predicates (presuppose that their arguments are of the appropriate sort)
- i. Signifiers of actions and temporal/aspectual modifiers (presuppose that the preconditions for the action are met)
- j. Iterative Adverbs, e.g. *too* and *again*, (presuppose some sort of repetition).
- k. Others (e.g. implicatives such as *manage*, verbs of judging such as *criticise*, the focus-sensitive particles *even* and *only*)

What has been noted over the years, however, is that the items on this list differ with respect to various properties associated with presuppositions: accommodation, cancellability in embedded environments, the type of discourse antecedent (if any) they require, etc. As Karttunen (2016) notes: "The zoo of presupposition triggers should have been constructed with separate cages for different species." Over the years, researchers proposed various types of separate cages, but the taxonomisation into different (sub)species has turned out to be problematic as well.

One question is whether the items on the list are all examples of presupposition, or if some are rather examples of a different phenomenon, e.g. conventional implicature (cf. e.g. Karttunen 2016). The trouble is that the difference between presuppositions and conventional implicatures is itself a contested matter: while Potts (2005) argued forcefully that there is a real distinction between the two phenomena, Simons et al. (2010) lump them together, and yet others proposed that certain cases of conventional implicatures should be thought of as presuppositions (cf. Schlenker 2007).

Another question is whether we should distinguish separate subspecies of presuppositions. The problem here is that different subspecies emerge depending on the particular diagnostic used, e.g. cancellability, anaphoricity, ease of accommodation, behaviour in case of presupposition failure, etc. Differences in cancellability in embedded environments have lead Abusch (2002, 2010) to propose two classes: soft vs. hard presuppositions (see also Simons 2001, Abbott 2006, Romoli 2015). 'Soft presuppositions' (e.g. factive verbs, change of state verbs, the existential presupposition of focus) were argued to arise pragmatically, which would explain why they appear more easily cancellable, while hard presuppositions (e.g. focus particles, clefts, definite descriptions, *too*, *again*), by assumption, are lexically triggered, hence hard to cancel.¹²

Differences in anaphoric properties were the basis of Zeevat's (1992) classification of triggers into *resolution* vs. *lexical* triggers. The first class contains items that are primarily anaphoric such as definite descriptions, factive *when* and *after*-clauses and clefts. The second class contains items that denote concepts which can only be applied if certain conditions are met. Examples include predicates with an associated sortal restriction or predicates of actions and states with associated preconditions. (Zeevat

¹²Abusch's distinction has re-opened the possibility that at least soft presuppositions are a type of conversational implicatures, cf. Romoli (2015). See also Gyarmathy (2015) who uses abductive reasoning to derive the presuppositions of culminations.

(1992) also distinguishes a third class, though without giving it a name, the class of iterative presuppositions associated with items such as *too*, *again*.)

Triggers also show differences with respect to how easily they can be accommodated. Spenader (2002) examined the behaviour of various presupposition triggers in spoken discourse (the London-Lund Corpus), such as factive verbs and adjectives, aspectual verbs, *it*-clefts, definite descriptions and *too*. She observed that the tendency to convey new information for the hearer in the discourse (i.e. to accommodate) differed greatly by trigger type: The most likely to accommodate were aspectual verbs and factives, while only two examples of presuppositions triggered by *too* were interpreted as cases of accommodation.¹³ Spenader’s findings are corroborated by observations made in Beaver and Zeevat (2007). These authors identify demonstratives, pronouns, short definite descriptions, names, iteratives *too*, politeness markers (French *tu*, *vous*), intonational marking of focus as being hard to accommodate. The remaining class of more easily accommodating items includes factives, implicatives, aspectual verbs, sortally restricted predicates, clefts, long definite descriptions and long names.

Glanzberg (2005) was concerned with presupposition failure, i.e. what happens when a presuppositional item is uttered in a context that is incompatible with the presupposition of that item. He observed that presuppositions fall into two categories with respect to their behaviour in this situation: some presupposition failure leads to failure to express a proposition (e.g. in the case of clefts, demonstratives and factives), but this does not happen with all triggers, e.g. *even*, *too*. He proposes that the observed differences follow not so much from the basic nature of presuppositions, but rather from the relationship between the asserted content with the presupposition: when the asserted content can update the context even when the presupposition fails we do not observe failure to express a proposition.

Tonhauser et al. (2013) examined various types of projective content, presuppositions as well as conventional implicatures. They argue that projective content should be divided into three subclasses, depending on whether they are subject to what they call the “Contextual Felicity” constraint (roughly whether the trigger imposes an anaphoric requirement on the context), and whether they give rise to a so-called “Local Effect”, roughly the ability to accommodate locally under certain operators (e.g. attitude verbs). Class A triggers (pronouns, demonstratives, *too*) are subject to both constraints, Class B triggers (conventional implicatures) are subject to neither, and Class C triggers (e.g. change of state verbs, *almost*, *only*, possessive NP’s) show the “Local Effect” but are not subject to “Contextual Felicity” constraint. Remarkably, they do not find significant differences between the two languages they examine, English and Guaraní.

What is the cause of the observed empirical differences among triggers? One type of reply holds that presuppositional inferences can be classified into fundamentally different types. This approach is taken when researchers classify presuppositions into soft vs. hard triggers (cf. Abusch 2002, 2010, Simons 2001 and others): soft triggers have presuppositions that arise from pragmatics while hard triggers have hard-wired semantic presuppositions. A taxonomy of presuppositional inferences was also proposed in Ton-

¹³Spenader also identified differences that pertain to the semantic type of the triggering material, whether they presuppose semantically concrete individuals (as definite NPs) or semantically abstract objects (factives, aspectuals, etc), and also differences in the tendency to be globally or locally accommodated when they occur embedded.

hauser et al. (2013): “The evidence presented above minimally suggests that the classes of projective content A, B and C form a subtaxonomy in a better-developed taxonomy of meaning and are distinct on some dimension from e.g. ordinary entailments.”

Another type of explanation of the empirical differences does not assume a fundamental difference in the nature of presuppositional inferences. Instead, the differences are assumed to follow from the complex interplay of the meaning of the presuppositional item with its context as well as semantic and pragmatic principles. Glanzberg’s (2005) proposal is in this spirit and so is Spence’s (2002) reasoning about accommodation as well as Abrusán’s (2016) explanation of cancellation facts. Some facts clearly favour this view, e.g. the observation that longer definite descriptions and clefts accommodate more easily than short ones (cf. Prince 1978, Delin 1990, 1992, Beaver and Zeevat 2007), but on other facts the jury is still out.

A major recent contribution to this area was made by a wealth of experimental research. Since the empirical criteria described above can be easily investigated with experimental tools, the differentiation among various triggers have played an important role in this literature. Unfortunately, due to limitations of space, I cannot enter into the details of this extremely rich literature here. Overall, the findings seem to point towards real but gradient differences among triggers. As Schwarz (2019) notes in his recent article,

“Many results have lent further support to the notion that (classes of) triggers differ from one another in various ways, but these difference are neither absolute or categorical, nor do they straightforwardly support any current conceptual approach to differentiating triggers. While all aspects of the study of presupposition will benefit from further experimental work, the behavior of embedded triggers and the relation of triggers to more intricate aspects of discourse and discourse structure seem like an especially important area that deserves further scrutiny.”(p.35)

It thus seems that in the zoo of presuppositions we should not construct cages for subspecies after all; rather, the richness of presuppositional phenomena should be studied in the jungle of their interactions with other factors.

3.2 Triggering

If presuppositions are lexical properties of words and linguistic constructions, one would expect that the class of presupposition triggers should differ from language to language. Strikingly, this does not seem to be the case. For example, Levinson and Annamalai (1992) argued that presupposition triggers in English and Tamil overlap and also have the same projection properties in complex sentences. Similarly, Tonhauser et al. (2013) showed that Paraguayan Guaraní and English expressions consistently convey the same projective contents¹⁴ and also show the same projection pattern (see also Tonhauser 2019 for an even more fine-grained study).¹⁵ Both studies point out that the finding that the same truth-conditional meaning comes with the same presuppositions suggests

¹⁴Modulo some elements that do not exist in Guaraní, for example the definite article and gender on third person pronouns.

¹⁵Based on extensive empirical work on St’át’imcets (a.k.a. Lillooet, Northern Interior Salish), Matthewson (2006, 2008) argued that languages differ in the pragmatic constraints that they impose on the contexts in which they appear: for example, the content of presuppositions in St’át’imcets does not need to be entailed by the common ground, and this is the case even for triggers such as *too*, *again*

that presuppositions arise non-conventionally (see also Simons 2001).¹⁶ A more recent argument in favour of presuppositions being pragmatically triggered comes from the observation that presuppositions are not strictly linguistic: co-speech gestures and various other signs seem to have a presuppositional structure as well (cf. Schlenker 2019).

At the same time, as we have seen in the previous subsection, presupposition triggers differ from each other along various dimensions: cancellability, accommodation, anaphoricity, behaviour in case of presupposition failure, referentiality, etc. These observations have prompted researchers to argue that at least some presuppositions arise in a pragmatic way, and to propose a triggering mechanism dedicated to certain classes of triggers (Abusch 2002, 2010, Simons 2001, Abrusán 2011, 2016). Others aimed to find the “holy grail” of presupposition theory: a uniform process of presupposition triggering, see Simons et al. (2010).¹⁷ Let me review below the main types of ideas that have been proposed:

(a) Triggering from alternatives An interesting and distinct take on the problem was offered by Abusch (2002, 2005). She proposed that some presuppositions that are easily cancellable (namely, ‘soft’ presuppositions, for example the existential presupposition of factives, questions and the presuppositions of factives and change of state verbs) can be derived from the pragmatic alternatives that they associate with, by assuming that expressions presuppose that the disjunction of their alternatives is true. In the case of focus the alternatives are given by the semantics of these expressions cf. Rooth (1992) and subsequent work. In the case of factives and change of state verbs the alternatives need to be stipulated: For example the lexical alternative of *know* is to *be unaware*, while the lexical alternative of *stop* is *continue*. Abusch’s idea is widely accepted as an account of the (volatile) existential presuppositions of focus and questions. However, the proposal concerning verbs relied on a stipulation about lexical alternatives; indeed Abusch (2010) does not apply the idea to factive and change of state verbs any more. On the other hand, Abrusán (2016) proposed that the alternative-based method could be extended to the presuppositions of clefts as well, assuming we can explain the non-cancelability of the latter via other factors. Szabolcsi (2017) applied the idea to derive the presupposition of *too*, another notorious hard trigger. The idea of triggering from alternatives does not coincide any more with the cancelability of the presupposition (or, the class of ‘soft triggers’). Instead, it seems to be at play for triggers whose presuppositions arise from focus-alternatives.

(b) Triggering from the structure of semantic information (Aboutness) Another approach to presupposition triggering starts from the idea that the complex information conveyed by a proposition has internal structure.¹⁸ Once we understand the nature of this internal structure, it might give us a clue about what part of the conveyed total information is backgrounded (presupposed) and why. Informal remarks by

that in English are very hard to accommodate. Nevertheless, presuppositions in St’át’imcets project, just as they do in English.

¹⁶Naturally, for researchers who argue that presuppositions are nothing but conversational implicatures (reviewed in the previous section), presuppositions arise conversationally, see Kadmon (2001) for discussion.

¹⁷Unpublished work reported in Schlenker (2019) belongs to this category as well. Since this paper is still in progress, I do not discuss it this paper.

¹⁸This idea of internal structure of propositions was more recently explored in Yablo (2014) and Fine (2014, 2017) in a somewhat different context.

Stalnaker (1974) and Abbott (2000) point in this direction, with Stalnaker suggesting that presuppositions arise in order to avoid uncertainty about what a complex sentence’s main contribution to the context is. Wilson and Sperber (1979) order semantic entailments of the proposition expressed by a sentence based on the sentence’s syntactic form (including focus-marking). Entailments with a certain degree of semantic independence from the rest of the entailments are predicted to be presupposed. Abrusán (2011) focuses on the presuppositions of verbs. I proposed that there is default triggering rule according to which what is not the main point of a sentence is presupposed. Entailments that are about the main event described by the sentence constitute the sentence’s main point; what is not about the main event is presupposed. For example, in *John knows that it is raining* the main event is described by the matrix verb *know*. The entailment that ‘it is raining’ is not about this event (in a technical sense of aboutness given in Demolombe and Fariñas del Cerro 2010) and is therefore presupposed.¹⁹ Abrusán (2016) extends the idea to certain other triggers as well, e.g. *too*, *again*.

(c) Triggering based on discourse status Simons et al. (2010) proposed that information that does not answer the current question under discussion (QUD) projects. QUD is to be understood as defined in Roberts (2012). This theory was proposed for all projective meaning, presuppositions and conventional implicatures alike. Note that it is radically context-sensitive: changing the QUD might completely change what ends up being presupposed (projected). Abrusán (2011) argued that context sensitivity of presuppositions, though real, is much more limited in scope than what is predicted by Simons et al. (2010). Simons et al. (2016) offer a refined version of their original proposal, concentrating on factive verbs.

It is interesting to note that all the above theories relate presupposition triggering, to *information structure*, in one sense or another: be it (a) focus structure, (b) aboutness or (c) discourse-structure. These are different—though related—ways of foregrounding/backgrounding information. The ideas do not exclude one another, either. For example, Abrusán (2011) complements her basic, aboutness-based account with a discourse-sensitive aspect as well. It is also possible that different types of triggers require different mechanisms, as was suggested in Abrusán (2016). The triggering problem(s), though far from being solved, has at least come within sight.

3.3 Factors that influence presupposition projection and interpretation

As was discussed in the Introduction of this paper, a defining characteristic of presuppositions is that they project. Most of the research on presupposition in the last fifty years concentrated on explaining a small set of projection ‘facts’, more or less as they were established in the 70’s in Karttunen’s pioneering works. The aim was to provide precise rules that explain how compositional calculation of meaning interacts with presuppositions. Gradually though it came to be noticed that projection is influenced by various semantic, pragmatic and contextual factors that are difficult to incorporate into a rule-based view of presupposition projection, be it semantic or pragmatic. Instead, it seems that actual projection facts result from a complex interaction of these factors,

¹⁹The actual proposal of Abrusán (2011) uses event times instead of events, to avoid some complications that arise with events. Here I present the intuition behind the proposal.

perhaps in conjunction with a basic projection mechanism (cf. also Degen and Tonhauser 2020). Below I provide a (non-exhaustive) list of various factors that seem to interact with projection in non-trivial ways: the first three relate to information structure of the sentence and the discourse, the remaining ones are more disparate.

Complex interaction with the previous discourse context It has been long noted that the treatment of presuppositions should be integrated with a richer notion of discourse structure and update than is available in standard dynamic semantics. Ideas that point in this direction were put forth both in rhetorical structure based and question-based theories of discourse. In the context of SDRT, Asher and Lascarides (1998) argued that in order to capture projection facts we need to reason about how the presupposition is rhetorically connected to the previous discourse context: projection depends (among other things) on the plausibility and strength of the available coherent rhetorical connections. Question-based theories of discourse organisation are the background for Simons et al.’s (2010) proposal: they argue that all projection facts can be derived from association with the question under discussion (QUD): simplifying somewhat, semantic material that does not answer the QUD projects. Whether or not this bold claim is empirically correct is a matter of debate (cf. Abrusán 2011, Karttunen 2016), but the idea that the QUD at least *influences* presupposition projection is likely true, see also earlier discussions in Chierchia and McConnell-Ginet (2000), Kadmon (2001), Beaver (2010). For example, a QUD that is explicitly about the content of a presupposition tends to block the presupposition from projecting. In the following example the context makes clear that the author is wondering whether method works with wombats as well: the presupposition addresses this question and is not felt to project.

- (9) I haven’t tried this with wombats though, and if anyone discovers that the method is also wombat-proof, I’d really like to know. (Beaver 2010)

For further discussion of the effects of the QUD on presupposition projection see Abrusán (2011), Simons et al. (2016), Beaver et al. (2017), Tonhauser et al. (2018), Xue and Onea (2011).²⁰

Prosodic prominence / focus marking Related to the previous is the issue of prosodic prominence / focus marking. I list it separately from QUD, because although focus marking some constituent can signal that it is an answer to some QUD, prosodical prominence (/focus marking) can also be motivated by other reasons. The importance of prosodic prominence for presupposition projection was already recognised in Delin (1992), Spenader (2002), Beaver (2010). More recently, numerous studies have tested the effect of prosodic prominence on projection (cf. e.g. Tonhauser 2016, Tonhauser et al. 2019, Cummins and Rohde 2015, Djärv and Bacovcin 2020) and though results vary, overall it

²⁰A related issue is the question-sensitivity of knowledge and attitudes in general, see Schaffer and Szabó (2014), Yalcin (2016) and Glanzberg (2019).

is fair to say that prosodic prominence does seem to have an effect on projection.^{21, 22}

Topicality Another information structural notion that seems to play a role in projection is topicality. The role of topicality was mostly discussed in connection with the interpretation of definite descriptions: Strawson (1950, 1964) observed that non-topical NP's can more easily get a non-presuppositional interpretation than topical ones (cf. also Atlas (2004), Atlas and Levinson (1981), Reinhart (1981), Schoubye (2009), among others.) For example, the NP in (10b) is non-topical, and therefore more easily understood as non-presuppositional, in contrast to (10a):

- (10) a. The King of France is bald.
b. The exhibition was visited yesterday by the King of France.

The effect of topics on the interpretation and projection of definite descriptions was confirmed experimentally in Abrusán and Szendrői (2013). In a different context, Beaver (1994) was concerned with predicting the right level at which presuppositions should be accommodated in sentences with quantificational determiners and conditionals. He shows that intermediate accommodation should be explained by taking into account the topic structure of the sentence and discourse.

Types of triggers As was mentioned above, all presuppositions are not equal, and recent empirical research has discovered significant differences among presuppositions with respect to projectivity, cf. e.g. Smith and Hall (2014), Tonhauser et al. (2018). Interestingly, differences exist not only when we compare types of triggers but even within a type, e.g. the presuppositions of individual factive verbs might differ in their projection properties. Moreover, the difference between 'classical' factives and verbs that presuppose their complement only optionally (also called part-time triggers, cf. Schlenker 2010) is not categorical but a matter of degree.

The content of the sentence: Probability, possibility of verification The content of the sentence and of (what might become) the presupposition seems also to have an effect on whether it ends up being projected. I single out two aspects that have been noted in the literature: the prior probability of the content of the presupposition and whether the truth of the sentence can be easily verified by the hearer.²³ With respect to probability, Beaver (1999) already noted that presupposition accommodation depends on the plausibility of its content in a given context. More recently, Yalcin (2007) argued that epistemic modals rely on probabilistic information states. Based on this idea, Lassiter (2012) proposed that the information states relevant to the theory of presupposition are also probabilistic: presuppositions are information that is judged highly probable. He

²¹Cross-linguistically, factivity-alternations often seem to interact with prosody and focus, cf. e.g. Abrusán (2011) (Hungarian), Kallulli (2006) (Albanian), Ozyildiz (2017) (Turkish), Jeong (2020) (Korean)

²²The discussion in Schlöder and Lascarides (2020) concerning the presupposition of focus suggests that on top of focus, pitch contour might also play a role in projectivity.

²³See also Asher and Lascarides (1998) for discussion on the role of the content of the presupposition and the context.

argued that this idea can explain some recalcitrant problems for presupposition projection theories, e.g. the proviso problem.²⁴ Schlenker (2010) argued that the probability of the content of the sentence in a given context²⁵ influences whether or not it is felt to be veridical and presupposed: the implication that Mary is pregnant is true and projects in contexts in which Mary is a responsible adult, but not in contexts in which Mary is a playful 7-year old:

(11) Mary hasn't announced to her parents that she is pregnant

Relatedly, Tonhauser et al. (2018) hypothesise that contents that are judged as more likely true (have a higher prior probability) should project more easily than content that is less probable.²⁶

Another factor is whether the truth of a sentence can be verified, whether or not its presupposition is true in the context. Sentences such as (12a) are felt to be true, in contrast to (12b):

- (12) a. The King of France is not sitting in this chair.
b. The King of France has not heard about the accident on the turnpike last night.

Lasnik (1993) proposed that (12a) is felt to be true because we can evaluate it independently from the King of France: the chair is either empty or someone other than the King of France is sitting in it. But a similar reasoning is not possible for (12b), see von Stechow (2004), Yablo (2006) and Abrusán and Szendrői (2013) for more discussion.

Perspectival reasoning It has been argued that in certain cases the apparent lack of presuppositions is due to perspectival reasoning: the presupposition is satisfied not in the global conversational context but in the beliefs of some contextually relevant protagonist. This was argued to be the case in connection with some examples of factives in Gazdar (1979), Holton (1997) and Abrusán (2020):

- (13) She knew that he would never let her down, but, like all the others, he did.
(Holton 1997)

In the above example, the attitude report is interpreted from the perspective of the subject of the attitude: this is why the content of the complement only needs to be true in the beliefs of the attitude holder. Abrusán (2020) argues that perspectival reasoning can also explain other examples in which presuppositions fail to project, i.e. in the case of temporal adjuncts or preposed because-clauses.

Morale It is becoming increasingly clear that presupposition projection is the result of a complex interaction of a number of factors (and the above is by no means an exhaustive list). Theories of projection cannot succeed unless they make room for taking into account

²⁴The basic idea is that conditional presuppositions are conditional probability statements, which, if certain independence relations hold, are equivalent to unconditional probability statements.

²⁵Schlenker (2010) in fact talks about the credibility of the attitude holder, but the issue boils down to the perceived probability of the embedded clause.

²⁶Schlenker (2019) also applies a probabilistic reasoning to predict why presuppositions are triggered.

all these diverse factors. One way to proceed might be to start with a baseline projection theory, but let its predictions be influenced by diverse pragmatic and semantic effects. An (incomplete) example of this way of thinking is Asher and Lascarides (1998), who extend van der Sandt’s (1992) anaphoric theory in ways that can make room for rhetorical effects and effects of sentential contents. Another way to proceed might be a constraint-based projection theory along the lines advocated by Degen and Tonhauser (2020) according to which projection theory is nothing else than a set of interacting constraints. This second option implies a more radical departure from conventional thinking about projection.

3.4 Presuppositions in attitude contexts

The behaviour of presuppositions in the scope of attitude verbs is a notoriously difficult problem. Depending on the context, (14a) can imply (14b) or (14c) or both (14b,c).

- (14)
- a. John wants to sell his cello.
 - b. John has a cello.
 - c. John believes that he has a cello.

For a long time, scholars debated which of the two inferences should be seen as primary, and how to derive the other inference, if present, from the primary presupposition (cf. Karttunen 1973, 1974, Heim 1992, Geurts 1999). Recently, Karttunen (2016) suggested that the problem should not be thought of a simple question of projection, but should be examined in the broader context of what licenses descriptions in the scope of attitudes. Recent work on the fine-grained representation of mental states e.g. *mental files* of Recanati (2012) and MSDRT by Kamp (2015), Kamp and Bende-Farkas (2018) and Kamp (this volume) as well as ADT of (Maier 2016) paves the way for an in-depth analysis of this issue, see Maier (2015) for a first step.

4 Conclusion

By way of conclusion, let me quote a paragraph from Kamp and Rossdeutscher (1994) which suits presuppositions perfectly:

There is a sense, therefore, in which this work confirms the widespread opinion that textual interpretation and inference are based on a complicated — in fact, for all we can see at present, a desperately complicated — web of linguistic and extralinguistic knowledge. We admit that we ourselves, as linguists of an essentially rule based persuasion, would have preferred if at least the inferences with which we deal here, and which seemed to us innocuous enough when we started, had proved amenable to a more strictly linguistic analysis than the one to which we have been led in the end. We do not think, however, that all that has been achieved is a long and convoluted proof of a general point that was plain to begin with. For analyses of the kind we attempt here do reveal something of how linguistic and extralinguistic knowledge interact. True, the interaction is extremely complicated, and we are only beginning to understand some of its intricacies. But this is a road along which there is a definite possibility of progress. The complexity of the web is daunting,

and often it may drive us to despair. But it is not, we think, ultimately inextricable. (Kamp and Rossdeutscher 1994, p. 167)

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