

Aspects of *Too* and *Enough* Constructions

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1. Introduction

Too and Enough Constructions (T&E) have traditionally been analyzed as comparative constructions which relates an actual degree to a modalized one (cf. Heim 2000, Meier 2003). In (1) for instance, Mary's age would be compared to an age at which she *can* drive:

- (1) a. Mary is old enough to drive
b. Mary is too young to drive

Karttunen (1971) first pointed out that T&E can sometimes have 'implicative' readings¹, implying that their complement holds (in the case of *enough*)—or fails to hold (in the case of *too*)—in the actual world, instead of merely holding in some possible world(s). In uttering (2) for example, the speaker seems to imply that Jean actually left early (contrast this inference to the (lack of) inference that Mary actually drives in (1a)):

- (2) Jean was clever enough to leave early

This implication appears to be defeasible ((2) could be followed by a sentence asserting that, for some reason, Jean didn't leave) suggesting that this inference is of a pragmatic nature. This is in fact the line pursued in Meier (2003), which argues that implicative readings like that of (2) are determined by context: the modality in (2) would involve a completely realistic accessibility relation, which only picks out the actual world, and thereby guarantees that the complement holds in the actual world.

However, once we turn to the French counterpart of T&E, we observe that this implication cannot just be pragmatic, as it is grammatically encoded. Indeed, in French, implicative readings only emerge in the Past tense², with matrix perfective aspect (*passé composé*), as in (4), while imperfective aspect (*imparfait*) gives rise to non implicative readings, as in (3). Note furthermore that the implication that arises with perfective aspect is not cancelable:

- (3) a. Jean était assez rapide pour s'enfuir (mais il ne s'est pas enfui)
'Jean was-**impf** quick enough to escape (but he didn't escape)'
b. Jean était trop lent pour s'enfuir (mais il s'est enfui)
'Jean was-**impf** too slow to escape (but he still escaped)'

- (4) a. Jean a été assez rapide pour s'enfuir (#mais il ne s'est pas enfui)
 'Jean was-**pfv** quick enough to escape (#but he didn't escape)'
 b. Jean a été trop lent pour s'enfuir (#mais il s'est enfui)
 'Jean was-**pfv** too slow to escape (#but he still escaped)'

English doesn't have an aspectual distinction in the past tense, hence (2) is ambiguous between a perfective and an imperfective reading, blurring the fact that implication and aspect are correlated and that, with the right aspect, the implication is not defeasible. The French data however cast serious doubt on a purely contextual account, which should in principle allow the implication to be cancelled (e.g., by forcing the context to provide another accessibility relation)³.

Because of the robustness of this implication in the perfective I propose that T&E are at base implicative (in the sense of Karttunen (1971)). Non implicative readings are derived through a genericity operator, whose presence is reflected by imperfective morphology, following Bhatt's (1999) analysis of the ability modal. Thus, the base meaning is only apparent in the perfective.

2. A Closer Look at the Data: Two Puzzles

As we have seen in the introduction, the first puzzle that needs to be addressed is why, in French, implicative readings of Too and Enough constructions (T&E) are associated with perfective aspect, and non implicative ones with imperfective aspect. A second related puzzle, which concerns the behavior of perfective T&E under negation, will come up in section 2.2.

2.1. Aspect and Implication

What is it about (im)perfective aspect that makes T&E (non-)implicative? A predecessor for this peculiar interaction of aspect and implication was discovered by Bhatt (1999), who showed that the ability modal is implicative with perfective aspect and non implicative with imperfective aspect, as illustrated in (5):

- (5) a. Jean a pu soulever cette table, #mais il ne l'a pas soulevée
 'Jean could-**pfv**. lift this table, #but he didn't lift it'
 b. Jean pouvait soulever cette table, mais il ne l'a pas soulevée
 'Jean could-**impf** lift this table, but he didn't lift it'

In Bhatt's (1999) analysis, the ability modal is at base implicative (in his account (5a) is roughly equivalent to '*Jean managed to lift this table*'). Non implicative readings arise from the presence of a genericity operator, which doesn't require verifying instances. In languages that have an overt aspectual

distinction, genericity is morphologically encoded by the imperfective, which is why, according to Bhatt's proposal, non implicative readings of the ability modal show imperfective aspect.

When we turn to English T&E we can see that the non-implicative readings are also linked to genericity. Recall that in English certain T&E seem implicative (cf. Karttunen 1971), while others don't. Contrast (6a) and (6b):

- (6) a. (Yesterday) Jean was clever enough to escape
 b. (In general) Jean was clever enough to solve math problems

Intuitively, (6a) and (6b) differ in that the former is most easily read as an episodic, whereas the latter favors a generic reading. Note however that in English, aspect is not overtly specified. Thus, while (6a) favors an episodic reading, it can be (re)interpreted generically. French doesn't have this option, as aspect is overtly specified. Under the assumption that the non implicative readings are always associated with imperfective morphology, we can see how in English a seemingly implicative T&E can systematically be (re)interpreted as a non implicative (hearers can reinterpret covert aspect as imperfective instead of perfective), while in French the implication is not cancelable.

Further evidence for the link between non implicative readings and genericity comes from the interpretation of Bare Plurals, which can be used to diagnose the presence of a genericity operator. Contrast the following:

- (7) a. (Yesterday) students were clever enough to leave the party early
 b. (Back in the days) students were clever enough to leave parties early

(7a) favors a Past episodic interpretation in which the bare plural subject is existentially interpreted. With this interpretation, there seems to be an actuality entailment (there are students who left the party early). (7b), on the other hand, favors a generic interpretation, with a generically-interpreted subject (referring to students as a kind, cf. Carlson 1977). With this interpretation, there is no actuality implication, providing support to the hypothesis that non implicative readings are associated with Genericity (as evidenced by the generic interpretation of the bare plural).

We have seen that T&E and the ability modal share the property of being implicative with perfective morphology and having their non implicative readings associated with genericity. As a working hypothesis, I will assume that T&E are at base implicative, as in Bhatt's analysis of the ability modal, and that non implicative readings are to be derived through a genericity operator.

2.2. The Implicative Nature of T&E

The second puzzle that emerges is the behavior of perfective T&E under negation. Before we turn to the relevant data, we need to briefly go over Karttunen's (1971) classification of implicatives. So far I have used the term 'implicative' loosely to describe how complements of certain predicates need to hold (or fail to) in the actual world. Karttunen coined the term implicatives for those predicates that entail the actuality of their complement clause when affirmative (8a), and its negation when negated (8b):

- (8) a. Jean managed to kiss Mary
 → Jean kissed Mary
 b. Jean didn't manage to kiss Mary
 → Jean **didn't** kiss Mary

Karttunen (1971) proposes that implicatives involve two dimensions: a level of assertion, which consists of the complement clause augmented by the matrix tense and modifiers; and a presupposition, consisting of a sufficient and necessary condition for the realization of the complement. Thus (8a) and (8b) *assert* (9a) and (9b) respectively, and both *presuppose* (9c):

- (9) a. Jean kissed Mary
 b. Jean didn't kiss Mary
 c. Jean's success in kissing M. depended only on his skill and ingenuity

Turning back to perfective T&E, we can see that they behave exactly like implicatives under negation, that is, *enough* constructions implicate the *negation* of their complement (while *too* constructions implicate their *actualization*):

- (10) a. Jean a été assez rapide pour s'enfuir (#mais il ne s'est pas enfui)
 'Jean was-pfv. quick enough to escape (#but he didn't escape)'
 → *Jean escaped*
 b. Jean n'a pas été assez rapide pour s'enfuir (#mais il s'est enfui)
 'Jean was-pfv. not quick enough to escape (#but he still escaped)'
 → *Jean didn't escape*

While the affirmative (10a) implicates that Jean escaped, the negative (10b) implicates that he didn't. What (10a) and (10b) have in common however is that there is a relation between a degree of quickness and Jean's escaping. What exactly is this relation? And why should (10) be a puzzle?

Before we look at the formal nature of the problem, we need to make another digression into the semantics of Gradable Adjectives. I follow von Stechow (1984), who analyzes them as relations between individuals and degrees.

QUICK(x) is x's quickness, that is, the maximal degree to which x is quick:

- (11) a. $\llbracket \text{quick} \rrbracket = \lambda d. \lambda x. \text{QUICK}(x) \geq d$
 b. Jean is 6' tall
 c. Jean's height $\geq 6'$

To understand what is puzzling about the pair of sentences in (10), we need to find a proper analysis which can derive the entailment for either the affirmative or the negative version of (10) and see whether adding a negation yields the correct entailment for the other. As we will see, this doesn't go through trivially. I will start by deriving the non actualization entailment of (10b). For concreteness, I use Heim (2000)/von Stechow et al. (2004) semantics for *enough* (and ignore tense and aspect for the moment):

- (12) $\neg[\text{Jean's quickness} \geq$
 $\text{MAX}\{d': \forall w \in \text{Acc}(w^*). \text{J. escapes in } w \rightarrow \text{J. is } d'\text{-quick in } w\}]$
 $= \text{Jean's quickness} <$
 $\text{MAX}\{d': \forall w \in \text{Acc}(w^*). \text{J. escapes in } w \rightarrow \text{J. is } d'\text{-quick in } w\}$
 Jean was less quick than the quickness he must have if he escaped

According to this analysis, the non actualization entailment follows straightforwardly: if in all the accessible worlds in which he escaped, Jean had a certain degree of quickness, and if his actual quickness is *below* that degree, it follows that the actual world is *not* one in which he escaped, and hence that he didn't escape in the actual world. However, when we turn to the affirmative case (10a), the analysis breaks down:

- (13) Jean's quickness \geq
 $\text{MAX}\{d': \forall w \in \text{Acc}(w^*). \text{J. escapes in } w \rightarrow \text{J. is } d'\text{-quick in } w\}$
 Jean was quicker than the quickness he must have if he escaped

In all accessible worlds in which he escaped, Jean had a certain degree of quickness, but just because Jean's actual quickness is greater than that degree doesn't entail that he did escape. In other words, in (13) quickness is a necessary condition for escaping, but not a sufficient one. (13) is compatible with a situation where Jean did not escape, not by lack of speed but perhaps by lack of motivation. But (10a) is incompatible with such a scenario: Jean has to have escaped (i.e., the actuality entailment is not cancelable).

What we seem to need in (10a) is for quickness to be a sufficient condition. We need Jean's quickness to be greater than a minimal degree of quickness that guarantees his escape:

- (14) J.'s quickness \geq
 MIN $\{d:\forall w \in \text{Acc}(w^*). J. \text{ is } d\text{-quick in } w \rightarrow J. \text{ escapes in } w\}$
 J. was at least as quick as the quickness that ensured that he escaped

In (14), Jean's quickness is compared to a degree of quickness such that if he had that degree of quickness, he escaped. Provided that the accessibility relation is reflexive (i.e., includes the actual world), we will infer from this comparison that Jean did indeed escape, as he was at least that quick.

Thus, to account for (10), we seem to need two degrees of quickness, a sufficient one (15a) and a necessary one (15b):

- (15) a. MIN $\{d:\forall w \in \text{Acc}(w^*). J. \text{ is } d\text{-quick in } w \rightarrow J. \text{ escapes in } w\}$
 b. MAX $\{d:\forall w \in \text{Acc}(w^*). J. \text{ is } d\text{-quick in } w \leftarrow J. \text{ escapes in } w\}$

I propose to collapse these two degrees into a *single* one, by using an *iota* operator, which, in turn, forces an *equivalence* relation, which I will justify in section 3.2.:

- (16) $\text{id}:\forall w' \in \text{Acc}(w). J. \text{ is } d\text{-quick in } w' \leftrightarrow J. \text{ escapes in } w'$

3. Proposal

In the previous section, I suggested that in an *enough* construction, the degree of adjective is a sufficient and necessary condition for the realization of the complement, or in other words, the relation between the degree of adjective and the complement clause is an equivalence. In this section, I motivate this equivalence. I focus on the implicative readings, based on the assumption that T&E are at-base implicative. In section 4, I show how to derive non implicative readings.

I will make the following two claims: (i) T&E contain a definite description of degrees which triggers a presupposition; (ii) It is this presupposition which establishes an equivalence relation between a degree of adjective and the realization of the complement. In this sense, my analysis relates to Karttunen (1971) in that implicatives presuppose a sufficient and necessary condition for the realization of their complements. I propose the following lexical entries⁴:

$$(17) \quad \llbracket \text{enough} \rrbracket = \lambda P_{\text{dest}} \lambda Q_{\text{st}} \lambda x \\ P(\text{id}:\forall w' \in \text{Acc}(w). Q(w') \leftrightarrow P(d)(x)(w'))(x)(w)$$

$$(18) \quad \llbracket \text{too} \rrbracket = \lambda P_{\text{dest}} \lambda Q_{\text{st}} \lambda x \\ P(\text{id}:\forall w' \in \text{Acc}(w). \neg Q(w') \leftrightarrow P(d)(x)(w'))(x)(w)$$

Thus *too* and *enough* take three arguments: a proposition, a predicate of degrees and an individual (in (10) the arguments are *that Jean escaped*, *quick* and *Jean*).

3.1. Deriving the implicative reading of *enough* constructions

Let's first focus on perfective *enough* constructions. (19a) would have the meaning paraphrased in (19b) and the presupposition in (19c):

- (19) a. Jean a été assez rapide pour s'enfuir
 'Jean was-pfv. quick enough to escape'
 b. J. had **the** degree of quickness sufficient & necessary for him to escape
 c. There is a degree of quickness sufficient & necessary for him to escape

I take the contribution of perfective aspect to simply provide existential closure over a time variable, and that of the past tense to locate that time variable prior to the utterance time. (19a) will then have the following LF:

- (20) $\exists t[t < t^* \ \& \ \llbracket \text{quick} \rrbracket]$
 $(\text{id}: \forall w \in \text{Acc}(w^*). [J. \text{ escape in } w \leftrightarrow J. \text{ is d-quick in } w])(J)(t)(w^*)]$

What is the accessibility relation in (20)? Intuitively, for (20) to be meaningful, we would like to fix certain parameters or conditions: we want to consider worlds that are very similar to ours, as far as the conditions for escaping are concerned (we don't want to consider for instance worlds where there is no gravity, and where Jean will therefore float away). Thus the type of modality involved in this equivalence seems to be purely circumstantial (cf. Kratzer 1991, von Stechow and Heim 2002), the type of modality which is used 'when we are interested in the necessities implied and possibilities opened up by certain facts'. 'Circumstantial modality is the modality of rational agents like gardeners, architects or engineers', it has explanatory power. Consider the example in (21):

- (21) I had to sneeze

In uttering (21) one does more than simply state a fact (the fact that I sneezed). What the modality contributes is a sort of explanation: the circumstances at that time (it is the beginning of allergy season, I am outdoors, pollen is flying around my nose, etc...) explain the inevitability of my sneezing: in all of those worlds in which these circumstances hold, I sneeze.

In T&E constructions, we seem to need a similar type of modality which restricts the worlds under consideration to those in which certain facts hold. For (20), the set of circumstances includes for instance the conditions of entrapment, and in all of the worlds in which these circumstances hold, Jean escapes if and only if he is d-quick. This type of accessibility relation is reflexive (the actual

world is accessible to itself). We can now derive (19a)'s actuality entailment (for simplicity reasons, I ignore the tense and aspect projections):

- (22) Jean a été assez rapide pour s'enfuir
 [[quick]](id: $\forall w \in \text{Acc}(w^*)$. J. escapes in $w \leftrightarrow$ J. is d-quick in w)(J)(w^*)

The presupposition of (22) yields the premise in (23a) and its assertion, the premise in (23b). From these two premises, we derive (23c) by Modus Ponens, through reflexivity:

- (23) a. P1: In all acc. worlds w , if Jean was d-quick in w , Jean escaped in w
 b. P2: Jean was d-quick in w^*
 c. \therefore Jean escaped in w^*

We can also derive the negation of (22), and get the correct entailment.

- (24) Jean n'a pas été assez rapide pour s'enfuir
 'Jean was-pfv. not quick enough to escape'
 \neg [[quick]](id: $\forall w \in \text{Acc}(w^*)$. J. escapes in $w \leftrightarrow$ J. is d-quick in w)(J)(w^*)

The presupposition of (24) is the same as that of (22) and yields the premise in (25a). The assertion this time yields the premise in (25b). From these two premises, we derive (25c) by Modus Tollens (again through reflexivity):

- (25) a. P1: In all acc. worlds w , if Jean escaped in w , Jean was d-quick in w
 b. P2: Jean was not d-quick in w^*
 c. \therefore Jean did not escape in w^*

3.2. *Sufficient and Necessary?*

Arguably, either direction of the biconditional may seem counter-intuitive. First, one might question the necessary part of the relation. After all, shouldn't *enough* mean something like *suffice*? Consider the pair of sentences in (26):

- (26) a. Marie n'a pas été assez belle pour être élue Miss France. #Son talent a aussi joué.
 M. was-pfv not pretty enough to be crowned Miss France. #Her talent also counted.
 b. Sa beauté n'a pas suffi à ce qu'elle soit élue Miss France. Son talent a aussi joué.
 Her beauty didn't suffice for her to be crowned Miss France. Her talent also counted.

(26b) is compatible with a scenario in which Marie *was* elected Miss France (thanks in part to the talent show), but that her beauty alone was not sufficient. The continuation states that another factor (i.e., talent) *also* contributed to her election. In (26a) however, one infers, as in our other perfective *enough* examples, that the complement didn't take place in the actual world, that is, in this case, that Marie was not elected Miss France, hence the continuation is odd, as the *also* is not interpretable.

Even more worrisome might be the *sufficient* part of the relation: could it be that mere quickness will make one escape? Surely there must be other conditions that should be factored in. The analysis I suggest here makes very strong predictions: because of the equivalence in the presupposition, the condition given by that presupposition should be the *only* condition which the realization of the complement depends on. If the complement also depends on an additional condition, we predict that the sentence should either be odd or that the two conditions should be equivalent. This prediction is in fact borne out.

Consider the following scenario: I am having a conversation with my cousin in Los Angeles about the glamorous life of Hollywood's jet-set. She tells me about a very exclusive party on the hills and in the course of the conversation, she establishes that in order to get invited, one has to be both rich and famous. Her friend Pierre jumps into the conversation and says:

- (27) Nick a été assez riche pour se faire inviter
'Nick was-pfv. rich enough to be invited'

In this context, (27) is a bit odd. Even if I don't know Nick, I get the impression that Pierre takes it for granted that he is famous. This oddity is in line with what the theory predicts: because Nick has to both be rich and famous, there is no degree of richness that can guarantee him getting invited. However, we accommodate that Nick is famous beyond the necessary threshold such that Nick being rich and famous is equivalent to him being rich. In more formal terms, the presupposition triggered by (27) is given in (28a); (28b) is what the background provides; (28c) is what the hearer accommodates:

- (28) a. $\exists d[\forall w \in \text{Acc}(w^*). N. \text{invited in } w \leftrightarrow N. \text{d-rich in } w]$
 b. $\exists d_1 \exists d_2[\forall w \in \text{Acc}(w^*). N. \text{invited in } w \leftrightarrow N. \text{d}_1\text{-rich \& d}_2\text{-famous in } w]$
 c. Nick is d_2 -famous in all accessible worlds

The context (28b) doesn't entail the presupposition in (28a). However, it does once we accommodate (28c).

To bring the point home, imagine a conversation about another party, where this time, one has to either be rich or famous to get invited. Pierre says:

- (29) Celine n'a pas été assez riche pour se faire inviter
'Celine was-pfv. not rich enough to be invited'

Again, the sentence seems odd. Even if I don't know Celine, I get the impression that Pierre takes it for granted that she is not famous. Once I accommodate (30c), the background (30b) entails the presupposition triggered by (29) in (30a)⁵:

- (30) a. $\exists d[\forall w \in \text{Acc}(w^*). C. \text{ invited in } w \leftrightarrow C. \text{ d-rich in } w]$
 b. $\exists d_1 \exists d_2[\forall w \in \text{Acc}(w^*). C. \text{ invited in } w \leftrightarrow C. \text{ d}_1\text{-rich} \wedge \text{d}_2\text{-famous in } w]$
 c. In all accessible worlds, Celine is not d_2 -famous

3.3. The Dual Relation between *Too* and *Enough*

In this section, I discuss the duality of *too* and *enough*. The following sentences are supposed to be truth-conditionally equivalent:

- (31) a. Jean a été trop lent pour s'enfuir
'Jean was too slow to escape'
 b. Jean n'a pas été assez rapide pour s'enfuir
'Jean was not fast enough to escape'

Before we can derive the equivalence between (31a) and (31b), we need to make a short digression into the polarity of gradable adjectives. The negative pole of an antonym pair (such as slow and quick) is treated as the negation of the positive pole. QUICK(x) is x 's quickness, that is the maximal degree to which x is quick. I adopt von Stechow's (1984) lexical entries:

- (32) a. $[[\text{quick}]] = \lambda d. \lambda x. \text{QUICK}(x) \geq d$
 b. $[[\text{slow}]] = \lambda d. \lambda x. \neg [[\text{quick}]](d)(x) = \lambda d. \lambda x. \neg \text{QUICK}(x) \geq d$

As seen at the beginning of section 3, *too* minimally differs from *enough* in that the equivalence relation is between a degree of adjective and the *non*-realization of the complement (the lexical entries are repeated below):

- (17) $[[\text{enough}]] = \lambda P_{dest} \lambda Q_{st} \lambda x$
 $P(\text{id}: \forall w' \in \text{Acc}(w). Q(w') \leftrightarrow P(d)(x)(w'))(x)(w)$
 (18) $[[\text{too}]] = \lambda P_{dest} \lambda Q_{st} \lambda x$
 $P(\text{id}: \forall w' \in \text{Acc}(w). \neg Q(w') \leftrightarrow P(d)(x)(w'))(x)(w)$

Sentences (31a) and (31b) have the LFs in (33) and (34) respectively:

- (33) Jean a été trop lent pour s'enfuir
 $\llbracket \text{slow} \rrbracket (\text{id}: \forall w \in \text{Acc}(w^*) . \neg \llbracket \text{J. escaped} \rrbracket^w \leftrightarrow \llbracket \text{J is d-quick} \rrbracket^w)(J)(w^*)$
 'Jean had the degree of slowness that guarantees that he didn't escape'
- (34) Jean n'a pas été assez rapide pour s'enfuir
 $\neg \llbracket \text{quick} \rrbracket (\text{id}: \forall w \in \text{Acc}(w^*) . \llbracket \text{J. escaped} \rrbracket^w \leftrightarrow \llbracket \text{J is d-quick} \rrbracket^w)(J)(w^*)$
 'Jean didn't have the quickness that guarantees that he escaped'

(34) is equivalent to (35b), which in turn is equivalent to (33), once we replace $\llbracket \text{quick} \rrbracket$ by the negation of its antonym adjective in (35a), and through the logical equivalence $\neg P \leftrightarrow \neg Q \leftrightarrow P \leftrightarrow Q$ in (35b):

- (35) a. $\llbracket \text{slow} \rrbracket (\text{id}: \forall w \in \text{Acc}(w^*) . \llbracket \text{J. escaped} \rrbracket^w \leftrightarrow \neg \llbracket \text{J. is d-slow} \rrbracket^w)(J)(w^*)$
 b. $\llbracket \text{slow} \rrbracket (\text{id}: \forall w \in \text{Acc}(w^*) . \neg \llbracket \text{J. escaped} \rrbracket^w \leftrightarrow \llbracket \text{J. is d-slow} \rrbracket^w)(J)(w^*)$

4. Non Implicative Readings of T&E

We have seen so far that T&E are at base implicative, that is, they entail the complement clause (or its non realization). This meaning emerges with perfective morphology which reflects the presence of a default existential closure. In this section, I show how the non implicative meaning of T&E results from the presence of a genericity operator that can include non actual worlds/situations.

4.1. A Predecessor: the Ability Modal (Bhatt 1999)

A predecessor for this interaction between aspect and implication is the ability modal as analyzed in Bhatt (1999). Bhatt observes that with perfective, the complement clause of an ability modal needs to be actualized (36a), while with imperfective it doesn't: (36b):

- (36) a. Jean a pu soulever cette table, #mais il ne l'a pas soulevée
 'Jean could-**pfv.** lift this table, #but he didn't lift it'
 b. Jean pouvait soulever cette table, mais il ne l'a pas soulevée
 'Jean could-**impf.** lift this table, but he didn't lift it'

Bhatt gives the ability modal the semantics of an implicative predicate (like *manage*), that is, in an ability construction, the assertion consists only of the complement clause, and a conventional implicature (cf. Karttunen and Peters 1979) relates that some effort went into the realization of the complement. In order to derive the non implicative meaning, Bhatt uses a genericity operator which doesn't require verifying instances, and is reflected by imperfective morphology.

As a starting point for T&E I adopt Bhatt's insight that imperfective on the matrix is a reflection of a genericity operator, which is responsible for the non-implicative readings of these constructions. In the next section, I give a semantics for this operator and show how, when combined with a T&E, it can yield non-implicative readings.

4.2. *Non-Implicative Readings of T&E*

Genericity is involved when reporting some kind of generalization over events (and/or individuals, but I will abstract from quantification over individuals as it not directly relevant), as opposed to referring to some particular events. These generalizations have a law-like flavor, while still allowing for some exceptions. Consider the following example:

- (37) a. John walks to school
 b. Mary handles the mail from Antarctica

(37a) is judged to be true even if, occasionally, John's mother drives him to school. As long as most of the events of John going to school involve him walking there, the sentence can be used felicitously, as if a silent "usually" were present in the sentence. (37b) is also judged to be true even if Mary has never yet received mail from Antarctica: should such mail arrive however, it would be Mary's responsibility to handle it. Somehow then, the generalization is made about a particular set of events, namely those events that are deemed relevant for the generalization to hold.

A fairly common approach to genericity is to postulate a covert operator (GEN) which universally quantifies over situations/worlds (cf. Krifka et al. 1995 and references therein). This set of worlds/situations is somehow restricted to the 'relevant' or 'normal' ones, in order to allow for exceptions. Thus (37a) would be paraphrased as '*in all normal/relevant situations, John walks to school*'. An instance of his mother driving him would not be considered a normal/relevant situation, thus it would leave the generalization unharmed.

Much about the precise nature of this operator hasn't been completely settled (Should we have only one operator to handle all generic statements? Should it quantify over worlds or situations? Should there be a distinct operator for individual variables? How does one define which situation/world is relevant?). However a common enough trait of many accounts is that GEN should involve universal quantification over relevant worlds/situations, where 'relevant' is defined in terms of normalcy. I will try to stay as theory-neutral as possible in my use of this operator and choose a modal implementation for simplicity (universal quantification over worlds) but nothing hinges on this choice and my proposal could be recast in terms of situations.

In a modal account, the worlds being quantified over will be obtained through an accessibility relation which picks worlds in terms of normalcy⁶. The set of worlds can be further restricted by context or by an overt adverbial. GEN basically has the semantics of a universal modal (with the possible difference that the accessibility relation is fixed): it quantifies over accessible worlds further restricted by an overt or contextually-provided proposition p , and in all those worlds that satisfy the restriction, the proposition q holds:

$$(38) \quad \llbracket \text{GEN} \rrbracket (p)(q) = \forall w' [w' \in \text{Acc}(w) \wedge p(w')] \rightarrow q(w')$$

(37b) will be handled as follows: the context adds to the restriction the proposition that mail arrives from Antarctica, and in all of these worlds, Mary handles that mail (I will from now on use the simplified notation in (39b):

- (39) a. $\forall w' [w' \in \text{Acc}(w) \wedge \text{mail arrive from A. in } w'] \rightarrow \text{M. handle mail in } w'$
 b. **GEN** $[w']$ (**mail arrives from A. in } w'); (**M. handles mail in } w')****

Going back to T&E, GEN can be added to yield a non implicative meaning:

- (40) a. Jean est assez rapide pour s'enfuir
 'Jean is-**impf** quick enough to escape'
 b. **GEN** $[w]$ (**J. has the sufficient/necessary quickness to escape in } w**)
 c. "In all *relevant* worlds Jean has the quickness to escape".

We, of course, need to be a bit more precise. What are these relevant worlds, and incidentally, what happens to the presupposition? The answer to the second question will provide one to the first, and comes from Schubert and Pelletier (1989) which proposes that presuppositions get accommodated into the restriction of the genericity operator.

In (41a), the predicate *land-on-one's-feet* presupposes that the subject is dropped to the ground. This presupposition is accommodated into the restriction of the genericity operator, which gives the paraphrase in (41b):

- (41) a. Cats land on their feet
 b. 'In all worlds where they drop to the ground, cats land on their feet'.

I propose that T&E's presuppositions also get accommodated into the restriction of the genericity operator, which has the effect of restricting the set of worlds to those that strictly depend on the subject's degree of adjective (Jean's quickness in (42)):

- (42) GEN[w]($\exists d: \forall w' \in \text{Acc}(w)$) J. is d-quick in w' \leftrightarrow J. escapes in w' ;
J. is d-quick in w
 “In every normal world where there is a degree of quickness that guarantees his escape, Jean has that degree of quickness”.

Crucially, the worlds in this set are highly *idealized*: again, we are looking at worlds that strictly depend on quickness. One can easily see that the actual world may not be in this set. For example, it could be that in reality, Jean is not smart enough: in that case, there would be no degree of quickness that guarantees his escape. This is precisely what we want for the non implicative reading, where the complement clause need not be actualized.

To close this section, I would like to elaborate a bit on the nature of the accessibility relation of the genericity operator. There is a remaining question about whether the accessibility relation should be fixed or whether generic statements can have different modal flavors, and in particular, whether they can have deontic readings. Consider the following example:

- (43) Dog owners pay taxes on them

(43) has a deontic feel and could be paraphrased as follows: ‘*in all worlds in which the laws are obeyed, dog owners pay taxes*’. Greenberg (2002) for instance take sentences like (43) to argue that indeed the accessibility relation can be deontic. However, two factors may cast some doubt on whether we are really dealing here with true deontic modality: one is that (43) cannot be continued by a sentence that denies that dog owners don’t pay taxes in reality, whereas a true deontic (e.g., *Dog owners should pay taxes on them*) is fine with such a continuation. Another factor is that the distribution of such deontically-flavored generic statements seems quite limited. If it turns out that we really want to disallow a deontic accessibility relation, the question arises about how to interpret those T&E sentences that seem to have a natural deontic reading, as in (44):

- (44) Mary is old enough to drink

I would like to argue that even if one were to fix the type of accessibility relation available to GEN, sentences like (44) could still retain their deontic flavor, as all of the work is done by the accommodation of the presupposition into the restriction. Indeed, in (44) the presupposition restricts the set of worlds in which the generalization holds to those that strictly depend on age. What could these worlds be? Clearly they represent a very small set of worlds, where consideration of the laws of nature or physics is almost irrelevant. There’s nothing particularly natural or physical about one’s age that associates a certain age with drinking, and we will tend to accommodate that legal considerations may be at play. Because the worlds quantified over are those and only those in which there is an age limit

for drinking, we take those to worlds to be worlds in which a man-made law is obeyed, and a deontic flavor arises⁷.

To sum up, the non implicative reading of T&E is due to the accommodation of the presupposition into the restriction of the genericity operator. This forces one to only consider worlds that strictly depend on the adjective. There are many ways in which actual world might be different, thus the complement clause may not hold in actuality.

5. Further Issues

5.1. Perfect Readings of the Perfective

What I have glossed so far as the perfective is the *passé composé*, which in French is ambiguous between a preterit (the use we have seen so far) and a perfect (cf. Smith 1991). Note that the preterit reading is incompatible with adverbs like *toujours*. Thus (45) has to have a perfect reading, and, as it turns out, in that case, we don't have an actuality entailment:

- (45) Jean a **toujours** été assez sobre pour conduire. Mais sa femme ne l'a jamais laissé, parce qu'elle ne lui fait pas confiance.
 'Jean was-pfv. **always** sober enough to drive. But his wife never let him because she doesn't trust him'.

In (45) the continuation implies that the complement clause didn't take place. Contrast with (46):

- (46) **Hier**, Jean a été assez sobre pour conduire. #Mais sa femme ne l'a pas laissé, parce qu'elle ne lui fait pas confiance.
 'Yesterday, Jean was-pfv. sober enough to drive. #But his wife didn't let him because she doesn't trust him'.

The crucial difference is that in (45) we have universal quantification over events, whereas (46) has existential closure. (45) seems to involve a Perfect of a generic (Perfect + Genericity Operator), which is morphologically realized as the *passé composé* in French, as can be seen in the example below:

- (47) Jusqu'à présent, la cigogne migratrice a toujours passé l'hiver en Afrique.
 'Until now, the migrating stork has always spent winter in Africa'.

Thus the generalization that 'perfective' morphology (*passé composé*) entails implicativity needs to be fine-tuned. It appears instead that the morphology reflects the presence of operators, which are in turn responsible for actuality

entailments or lack thereof. The genericity operator is generally reflected by imperfective (*imparfait*). However, if a Perfect scopes over it, its presence won't be transparent in the morphology.

5.2. Perspectives on Implicatives and Modals

To wrap up, I want to briefly talk about the ramifications of this analysis of T&E to other constructions that seem to share the property that their implicative behavior is contingent on matrix aspect. In this account of T&E, I have proposed to treat T&E as being at-base implicative, and as being able to combine with a genericity operator to yield non implicative readings. A similar account was proposed for the ability modal (Bhatt 1999). I would like to point out another type of construction that seems to pattern the same way, *HAVE-THE-X-TO*₁:

- (48) a. Jean a eu le courage de parler à Marie, #mais il ne lui a pas parlé.
 'Jean had-pfv. the courage to talk to Marie, #but he didn't talk to her'.
 b. Jean avait le courage de parler à Marie, mais il ne lui a pas parlé.
 'Jean had-impf the courage to talk to Marie, but he didn't talk to her'.

Here we even have morphological evidence for a definite description (with the definite article). We can straightforwardly extend the T&E analysis to this construction:

- (49) Jean a eu le courage/le temps/la force de parler à Marie
 'Jean had-pfv the courage/time/strength to talk to Marie'
 J. has [id:∀w∈Acc(w*)].[J. talks to M. in w ↔ J. has d-courage in w]-
 courage in w*

So far we have seen implicatives being sensitive to aspect. However, some implicatives never have non implicative readings. With imperfective, the only possible reading is a habitual one (with verifying instances). (50a) illustrates the *manage* type, and (50b) the *HAVE-THE-X-TO*₂ type:

- (50) a. Jean réussissait à parler à Marie ??(à chaque fois qu'il la voyait)
 'Jean succeeded-imp to talk to Mary ??(every time he saw her)'
 b. Jean avait le plaisir de parler à Marie ??(tous les vendredis)
 'Jean had-imp the pleasure to talk to Marie ??(every Friday)'

Thus one remaining issue is what differentiates those implicatives that are sensitive to aspect from those that are insensitive to it. (50a) was particularly worrisome for Bhatt's account, which gives *able* the semantics of *manage*, despite this crucial difference in implicative behavior. I leave it for further research to

determine which potential differences between perfective implicatives and real implicatives are crucial. Such potential differences may include lexical meanings (which will trigger different presuppositions) or interactions between different inner and outer aspects.

6. Conclusion

Based on the parallel with the ability modal (cf. Bhatt 1999), I have proposed that T&E are at-base implicative. The puzzling implicative behavior of T&E is due to a presupposed *equivalence* relation between a degree of adjective and a complement clause triggered by a definite description of degrees. Imperfective reflects the presence of a genericity operator, responsible for the non implicative readings. This operator quantifies over a set of idealized worlds (created by the accommodation of the presupposition), which doesn't necessarily include the actual world.

Endnotes

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¹I follow Karttunen's terminology here: 'implicate' is used as a neutral term as to whether this is an entailment, a presupposition or an implicature.

²In this paper, I focus on the Past tense, as French doesn't differentiate for aspect in the Present or the Future.

³Further problems with previous accounts are discussed in Hacquard (2004).

⁴For the purposes of the presentation, I abstract away from the syntactic structure of T&E constructions.

⁵The judgments also conform to the prediction, once we inverse the two scenarios and the two target sentences. In a context where Nick has to be both rich and famous and Pierre says: "*Nick n'a pas été assez riche pour se faire inviter*", I infer that he takes it for granted that Nick is famous (thus being rich and famous is equivalent to being rich), and in a context where he has to either be rich or famous, and Pierre says: "*Nick a été assez riche pour se faire inviter*", I infer that he takes it for granted that Nick is not famous.

⁶The sort of genericity involved in T&E is similar to that of dispositional generics, whose modal base has been argued to consist of intrinsic properties of the subject *in virtue* of which the generalization holds (cf. Greenberg 2002, Lekakou 2003).

⁷Possibly, a similar explanation could handle cases like (43), once we look more

closely at the sort of presuppositions associated with such statements.

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