

Non-actuality mood in Czech, Russian, German, and Norwegian

Abstract

Irrealis mood, or, to be more precise, mood with ‘non-actuality’ entailments, as figuring prominently, but far from exclusively, in counterfactual conditionals, has not yet received a comprehensive and compositional analysis. Focusing on four languages, the paper presents under-appreciated facts and a novel theory where the mood serves to activate alternatives to operations over propositions, in particular one: the identity operation, giving rise to implicatures of contrast. Depending on the context, these contrast implicatures amount to non-actuality or – in downward entailing environments – actuality entailments.

Keywords: mood, subjunctive, irrealis, non-actuality, contrast

1 Introduction

The aim of this paper is to show that irrealis, or, as I call it, **non-actualistic** moods in two Germanic and two Slavic languages – German, Norwegian, Czech, Russian – call for a treatment in terms of contrast implicatures, where the mood operates on a propositional operation and contrasts it with the identity operation, and to offer such a treatment. – This is a radical departure from previous approaches, in which an irrealis, whether realized as a ‘fake past’, a subjunctive or a conditional mood, is taken to operate either on a proposition or on a dyadic operation on propositions. Those approaches will be shown to face two major empirical challenges:

1. The mood marking is sometimes not in the clause expressing the proposition that non-actuality is entailed for but in a matrix clause.
2. The non-actuality entailment sometimes turns into an actuality entailment, essentially in downward entailing contexts.

The present analysis is set in the general theory of alternatives and exhaustification advanced by [Chierchia \(2013\)](#). It can be summarized in the following five points:

- The mood operates on meanings of modals, monadic propositional operations, and its ordinary semantic value is the identity function on such arguments.
- At the same time, it activates alternatives: its alternative semantic value contains the function mapping any propositional operation to the identity operation.

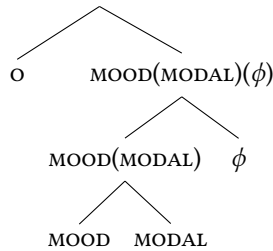
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- Through exhaustification at a sentence level, the alternative at this level – usually the argument proposition of the mood-modified modal – gets its negation added to the ordinary semantic value as a ‘grammatical’ implicature of non-actuality.
- However, if the context where exhaustification applies is negative, the alternative is itself negative, resulting in an implicature of *actuality*.
- Like any implicature, the (non-)actuality implicature is defeasible, and will fail to arise in the face of threatening inconsistency.

The first two points state, by stipulation, the semantics of the non-actualistic mood – its ordinary and alternative semantic values. That much is new, but the rest is old: The three last points follow from the meaning of the mood in conjunction with the general theory of alternatives and exhaustification.

The third point sets out, in a nutshell, how the non-actuality entailment comes about: Once activated, alternatives must be factored into meaning, and with the O (for ‘only’) exhaustifier, also called *Exh*, this operation results in an added conjunct NOT ϕ where ϕ is usually the argument of the modified modal. Schematically:

$$(1) \quad \text{O}(\text{MOOD}(\text{MODAL})(\phi)) \equiv \text{MODAL}(\phi) \text{ AND NOT}(\phi)$$



Note that MOOD(MODAL) and ϕ can be expressed in two different clauses, the latter in an embedded clause and the former in a matrix; this explains how the mood marking can be ‘upstairs’ while the non-actual proposition is expressed ‘downstairs’ – cf. 1. Note, too, that if, say, a negation intervenes between *o* and *o*(MOOD(MODAL)(ϕ)), the added conjunct will not be NOT ϕ but NOT(NOT ϕ), that is, ϕ ; this explains how the mood can bring about an actuality entailment – cf. 2. and the fourth point. The fifth point, finally, articulates a corollary of the theory which will prove explanatory in connection with, in particular, so-called semi-factual conditionals.

As a simple instance of the schema (1), consider the Russian sentence (2), cited by Dobrušina (2016, 146f.) and replicable in Czech, German and Norwegian:

- (2) On dolžen byl by vseh razbudit',
 he obligated was SUBJ all awaken
 ‘He was due to have woken everyone up, ...’

According to Dobrušina, in contrast to the sentence without the subjunctive particle *by*, (2) entails *on ne razbudil ih* – ‘he failed to awaken them’. With reference to (1), MOOD = *by*, MODAL = *dolžen* ‘due’, and ϕ = *on vseh razbudil* ‘he woke everyone up’. *o*, finally, is assumed to be covertly present in a position at the top level of (2) and to contribute the negation of the alternative – ϕ – to the meaning of the sentence.

The paper is organized as follows. Section 2 brings preliminary clarifications in two key regards: First, the formal means of signaling non-actuality through mood in the languages under study and their functions beyond signaling (non-)actuality, second, the signs by which to tell a non-actualistic mood in a language apart from other uses of the same formal machinery, and a working definition.

In section 3, existing formal semantic work on ‘irrealis’ mood, including work on English ‘subjunctive conditionals’, is reviewed, and novel evidence constituting serious challenges to every previously proposed account is presented in section 4. The alternative, novel account is set out in section 5 and shown to produce precise predictions for the problem cases from section 4, and in section 6, predictions about counterfactuals are explored and shown to be adequate as well. Section 7 addresses potential counterevidence to the theory, and section 8 brings conclusions.

2 Non-actuality mood: Preliminaries

The four languages Czech, Russian, German and Norwegian have been selected for study because they show a spread in how non-actualistic mood is expressed and in how the same expression can also be used to express a ‘non-non-actualistic’ mood. These variations are described in section 2.1.

It is also useful to have as accurate a sense as possible of what a non-actualistic mood is and of what distinguishes it from other uses of subjunctive or ‘fake past’ in one or the other of the four languages. Section 2.2 brings a discussion of how to single it out, coalescing into a working definition.

2.1 Mood in the four languages, forms and functions

The following overview of the formal machinery of irrealis mood and of its place in the functional field of mood in the languages under study is based, in particular, on three monographs: [Bech \(1951\)](#) (in regard to Czech), [Fabricius-Hansen et al \(2018\)](#) (in regard to German), and [Dobrušina \(2016\)](#) (in regard to Russian).

2.1.1 Forms

Morphologically, Norwegian stands out from the other three languages in that there is no subjunctive, leaving auxiliaries and fake tenses, such as past perfects in present and past contexts, as the regular means of encoding non-actualistic mood.

- (3) Jeg hadde vært død nå.¹
 I had been dead now
 ‘I would be dead now.’

German, Russian and Czech have subjunctives which encode non-actuality, but the subjunctive manifests itself differently in the three languages:

- in German, as the subjunctive, *umlaut* stem paradigm of one of several auxiliaries or a main verb,

¹Source: <https://khrono.no/nord-universitet-ovelse/skremmende-realistisk-terror-ovelse-pa-nord/141072>

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- in Russian, as the particle *by*, which can stand alone or cliticize to the declarative complementizer *čto*,
- in Czech, as the subjunctive, *by(-)* stem of the auxiliary *být* ‘be’, which combines with perfect participles and can help form the declarative complementizer *aby(-)* or the conditional complementizer *kdyby(-)* (see, e.g., [Hana \(2007, 81\)](#)).

(4)–(6), in German, Russian and Czech, respectively, may illustrate:

- (4) Ich wäre jetzt tot!²
I was.SUBJ now dead
‘I would be dead now!’
- (5) Ja byl by sejčas mertv.³
I was SUBJ now dead
‘I would be dead now.’
- (6) Byl bych ted’ mrtvý...⁴
been am.SUBJ now dead
‘I would be dead now.’

In all three languages, this subjunctive marking is – as far as the non-actuality use is concerned – regularly accompanied by some form of ‘fake past’ ([Iatridou, 2000](#)). In Russian and Czech, past forms of verbs, simple in Russian, periphrastic in Czech, are used in past and present contexts,⁵ in German, past (or past perfect) forms are used in present contexts and past perfect forms are used in past contexts.

2.1.2 Functions

The subjunctive-cum-fake-past forms found in Czech, German and Russian are not uniform functionally but serve other functions than marking non-actualistic mood as well. Notably, these other functions are different in the three languages:

- In Czech and in Russian, the subjunctive is prominently used in purpose clauses and in ‘purpose-like’ complement clauses ([Dobrušina 2016, 263ff.](#), [Sočanac 2017](#)). These uses are closely akin to the ‘intensional’ subjunctive in Romance languages ([Stowell 1993, Quer 1997](#)). They are often described in terms of matrix predicates ‘licensing’ or ‘selecting for’ subjunctive complements, for example, Czech *chtít* or Russian *hotet* ‘want’, as in (7) and (8) below.
- In German, there is instead a prominent use of the subjunctive in reported speech ([Fabricius-Hansen et al, 2018, 105ff.](#)), exemplified in (9) below.
- All three languages exhibit a ‘polarity subjunctive’ usage closely akin to the uses of Romance subjunctives designated by this term ([Stowell 1993, Quer 1997](#)) – see [Bech \(1951, 45ff.\)](#), [Dobrušina \(2016, 242ff.\)](#), [Kagan \(2013, 133ff.\)](#), [Fabricius-Hansen et al \(2018, 62ff.\)](#) – and exemplified in the Czech sentence (10) below.

²Source: <https://www.wochenblatt.de/archiv/wie-viele-unfaelle-muessen-hier-noch-passieren-61847>

³Source: Galina Gončarova, *Učít'sja, vľjubít'sja... ubít'sja?*

⁴Source: <https://adoc.pub/no-title32e911e5848cc10af0cfed401f068c3e69321.html>

⁵Note that in Russian, the subjunctive particle can occur in (infinitivals and in) predicates without copula, hence with the present tense, see [Dobrušina \(2016, 117ff.\)](#); such contexts do not strictly license non-actuality inferences.

- (7) Chtějí, aby se část CO₂ ztrácela v podzemí.
want that-is.SUBJ REFL part CO₂ lost.FEM in underground
'They want some of the CO₂ to disappear underground.'⁶
- (8) Učenie hotjat, čtoby vřednyj CO₂ sprjatali pod zemlej.
scientists want that-SUBJ harmful CO₂ hid.PL under ground
'Scientists want to hide away harmful CO₂ underground.'⁷
- (9) Er schrieb mir, ..., zwei Jahre nach unserer Trennung. Ich würde ihm
he wrote me two years after our separation I would.SUBJ him
fehlen, ...⁸
miss
'He wrote to me two years after we split up, saying he missed me.'
- (10) Sluníčka má dosti, vláhý taky a roste jak divá ale aby
sunshine has enough moisture too and grows like wild but that-is.SUBJ
vykvetla to ne.⁹
bloomed that not
'It gets enough sunshine and moisture and grows like wild, but blossom it
doesn't.'

In Norwegian, on the other hand, fake pasts and fake past perfects are, by and large, exclusively used in a (non-)actuality entailing sense. One may object to the use of the term 'mood' about (pure) fake past in subjunctive-less languages; I do so here for simplicity, without attaching any theoretical importance to it.

2.2 Delineation and a working definition

What I mean by non-actuality entailments and non-actualistic mood is something quite strong: Unless prevented by threat of inconsistency (in systematic ways, see sections 5.3.2 and 6.3), the mood causes the sentence to entail the falsity (or truth) of a constituent sentence. The term 'irrealis' has been used in roughly this sense – see, e.g., Csipak (2015, 19ff.) – but for the most part it is, particularly in typological literature, used in a much wider sense, as more or less synonymous with markings of non-veridicality; see the discussion by, e.g., Mithun (1995) and von Prince (2020). Hence it could be misleading to speak of irrealis in the present context, where what is at issue is what von Prince (2020) calls **the counterfactual domain of irrealis**. On the other hand, the term 'counterfactual', especially in philosophical literature, tends to be linked with conditionals and might unduly narrow the phenomenology under study. Hence, taking cues from the literature on 'actuality entailments' and 'actualistic interpretations' arising from root modals in perfective past tenses (see, e.g., Hacquard 2021 and Homer 2021), I speak of non-actuality entailments arising from non-actualistic mood, and I will presently delineate these notions and provide clues for recognizing the phenomena which fall within their scope.

⁶Source: <https://www.sosbn.cz/wp-content/uploads/2017/03/2-Purkrtov%C3%A1-CO2.pdf>

⁷Source: <https://hi-tech.news/science/1958-uchenye-hotjat-chtoby-vrednyj-co2-sprjatali-pod-zemlej.html>

⁸Source: <https://www.faz.net/aktuell/stil/leib-seele/ich-du-er-sie-es/wenn-der-partner-den-17348070.html>

⁹Source: <https://www.zahrada.cz/forum/listnace/co-je-to-za-strom-373166/?kotva=co-je-to-za-strom-373238>

A first heuristic can be drawn from the fact about Norwegian noted in section 2.1.2: Here, fake past (perfect) is, by and large, exclusively used in a (non-)actuality entailing sense, so that whenever a subjunctive in Czech, German or Russian can be translated into that language with a fake past (perfect), one can be fairly confident that it is used in that same sense.

It is possible to say something more, however, and something more principled. In fact, non-actualistic mood coincides reasonably well with what has traditionally been called the ‘independent’ subjunctive,¹⁰ as opposed to uses of subjunctive that are conditioned by some certain kind of context, mostly a matrix clause predicate, where subjunctive may be the only possible mood, or indicative and subjunctive are interchangeable. By contrast, when subjunctives occur independently, they make a difference: indicative can be substituted, but as a rule, the meaning will be affected.

In the standard case, the difference made by the independent subjunctive is an added entailment of non-actuality, as illustrated in the two Russian sentences (11) and (12), a near-minimal pair where only the first member features the subjunctive; (11) licenses the inference that I did not call Vadim, while (12) licenses the inference that she did call Zina. And although the first clause in (12), without the particle *by*, is also compatible with a context in which no call was made, the first clause in (11), with the *by* particle, is only compatible with a context in which no call was made.

- (11) Nado bylo by pozvonit’ Vadimu, no ja rešil ne delat’ ètogo.¹¹
 necessary was SUBJ call Vadim but I decided not do it
 ‘I should have phoned Vadim but I decided not to.’
- (12) ...nado bylo pozvonit’ Zine, no Zina ne brala trubku.¹²
 ...necessary was call Zina but Zina not took tube
 ‘...she had to call Zina, but Zina didn’t pick up the phone.’

Thus in this example of the standard case, the mood is responsible for an entailment of non-actuality with respect to the prejacent of the necessity modal.

Two non-standard cases must be taken into consideration:

1. The case where the non-actuality entailment switches to an actuality entailment in a negative context, see section 4.2,
2. the case where the non-actuality (or actuality) entailment is overridden by a conflicting entailment or presupposition (see sections 5.2 and 6.3) and fails to materialize.

But note that even in case 1., the mood marking, be it pure subjunctive, subjunctive-cum-fake-past, or fake past, will make a meaning difference vis-à-vis the indicative, real-tense alternative, which will lack the actuality entailment and frequently have a non-actuality entailment instead.

¹⁰ e.g., “der unabhängige Konjunktiv” ‘the independent subjunctive’ (Bech, 1951); “der selbständige irreale Konjunktiv” ‘the autonomous counterfactual subjunctive’ (Fabricius-Hansen et al, 2018); “soslagaťel’noe naklonenie v nezavisimyh konstrukcijah” ‘subjunctive in independent constructions’ (Dobrušina, 2016)

¹¹ Source: <http://www.maxima-library.org/knigi/genre/b/233032?format=read>

¹² Source: <https://litschool.pro/almanah/proza1/lyubov/>

Note one other case where a non-actuality entailment may not be forthcoming: Sometimes, a sentence contains two or more mood markers, one in an embedded clause and another in the matrix, say (subjunctive conditionals are a case in point); then the lower occurrence may be an uninterpretable concord phenomenon.

Summing up, an occurrence of a mood marker of the forms surveyed in section 2.1.1 can count as an occurrence of non-actualistic mood if and only if

- it causes a sentence to entail the negative or the positive of a type *t* constituent, or
- a negative or positive entailment for a constituent would cause inconsistency, or
- it is *c*-commanded by another occurrence satisfying one of these conditions.

We will see in section 5, where the analysis is presented, that the relevant sentence can be the root sentence or a subordinate one, that the relevant type *t* constituent is always the argument of some modal which is in turn the argument of the mood, and that the entailment will be positive only if the context is downward entailing.

A note on the term ‘entailment’ is in order. It is not intended to commit to any specific notion of the status of the inferences in question or how they come about. Rather, like the label ‘actuality entailment’ in connection with root modals in past tenses, ‘non-actuality entailment’ is used as a label in a pretheoretic sense. As previewed in section 1, the inferences will be analyzed as conversational implicatures, not as presuppositions or logical entailments. On the other hand, in the grammatical theory of implicatures the analysis will be based on, once the implicatures are there, they figure as additional truth conditions on a par with the original content; therefore, the term ‘entailment’ turns out to be quite appropriate.

3 Previous proposals and their commonalities

Quite a few proposals have been made for describing the contribution of fake past or subjunctive to the meaning of a sentence in more or less formal semantic terms. Few of these have been articulated compositionally, however, as definitions of the meaning of the fake past or subjunctive which could be written on this form:

$$(13) \quad \llbracket \text{MOOD} \rrbracket = \lambda \dots$$

Moreover, most of the proposals are tailored to English ‘subjunctive’ conditionals.

Still, some of the proposals that have not been articulated compositionally lend themselves to such an articulation, and some that are tailored to conditionals can be generalized to other contexts – as shown in the following survey, where it will become clear that all the proposals have their merits. All will also face challenges, however, in the form of a class of facts to be presented in section 4.

3.1 Presupposing non-membership or non-overlap

A common assumption about ‘subjunctive conditionals’ is that they are counterfactuals and “presuppose that their antecedent is false” (von Fintel, 1998, 29).¹³ Indeed, the terms ‘subjunctive’ and ‘counterfactual’ have often been used interchangeably.¹⁴

¹³Note that this assumption is not shared by von Fintel.

¹⁴Cf. also Lakoff (1970, 177) and (Krakauer, 2012, 12).

The most direct implementation of this idea is offered by Schlenker (2005, 279), who lets the English ‘subjunctive’ apply to a world and trigger the presupposition that this world is different from the world of evaluation.¹⁵

$$(14) \quad \llbracket \text{SUBJ} \rrbracket^w = \lambda w' \begin{cases} w' & \text{if } w' \neq w, \\ \text{undefined} & \text{else} \end{cases}$$

This analysis is based in the analysis of conditionals proposed by Schlenker (2004), where an *if* clause denotes a possible world, the closest to the world of evaluation where the antecedent is true; when w' is that world, (14) amounts to presupposing that the antecedent is not true in the world of evaluation, as set out in (15):

$$(15) \quad \llbracket \text{SUBJ} (\text{if } \phi) \rrbracket = \lambda w \llbracket \text{SUBJ} \rrbracket^w (f(\llbracket \phi \rrbracket, w)) = \lambda w : f(\llbracket \phi \rrbracket, w) \neq w . f(\llbracket \phi \rrbracket, w)$$

Now however this result is obtained, it is controversial, since the assumption that the antecedent is presupposed to be false has often been argued to be too strong – see, e.g., Mackay (2019) and von Stechow (1998), but also, in its defense, Zakkou 2019. More critically perhaps, it is difficult to see how the analysis could be generalized to SUBJ mood outside conditionals.

In his work on German *dass* ‘that’ and *wenn* ‘if’ clauses in their use as optatives, Grosz (2012, 168) provides a definition of counterfactual mood, located above T and applying to a proposition, which is a little weaker: The presupposition it introduces is not that the proposition fails to contain the world of evaluation, rather, it is that it fails to overlap with the set of worlds compatible with what the speaker believes: “The speaker presupposes p to be false.”

$$(16) \quad \llbracket \text{Mood}_{\text{CF}} \rrbracket^c = \lambda p \lambda w : p \cap \text{Dox}_{\text{speaker}}(w) = \emptyset . p(w)$$

Because the mood can apply to any proposition, this analysis is much more general than Schlenker’s. But precisely because the mood applies to propositions, the facts to be encountered in section 4.1 will be problematic, and because its contribution is a presupposition, the facts to be encountered in section 4.2 will be problematic too.

Targeting the English ‘modal past’ in conditionals, Schulz (2014) defines a still weaker presupposition: the relevant subset of the antecedent is not consistent with the ‘epistemic center of the speaker’, E^* . This presupposition is not encoded in any definition of the modal past as such but in that of a special operator for subjunctive conditionals, **S**. However, a compositional analysis of the modal past can be interpolated by defining an operation over binary modal operations, as in (17).¹⁶

$$(17) \quad \llbracket \text{ModalPast} \rrbracket^{w_0, g} = \lambda M_{S((st)((st)t))} \lambda w \lambda p \lambda q : \text{Opt}_{g(R)}(w)(p) \cap E^* = \emptyset . M(w)(p)(q)$$

In words, the modal past adds to a binary propositional operation a presupposition of non-overlap between the epistemic center and a subset of the first argument. One challenge for an analysis like this is that non-actualistic mood often cooccurs with *unary* modal operators; another is posed by the data described in section 4.2.

¹⁵Schlenker’s definition is somewhat more complex; I render it in a simplified form and a more conventional notation. In (15), f is the selection function defined by Dowty (1976, 208), building on Stalnaker (1968).

¹⁶The notation of Schulz (2014, 132) is here simplified for perspicuity and ease of comparison.

3.2 Subtracting the world of evaluation

Focusing on ‘fake past tenses’ in a language like English or Greek, Iatridou (2000) identifies past tenses, whether ‘fake’ or ‘real’, with the morpheme, or feature, ExclF (exclusion feature) which is underspecified for what it ranges over, times or worlds; in both cases, the index of utterance is excluded from the set the feature applies to – or in another wording, the times/worlds ‘of the speaker’ are excluded from those ‘that we are talking about’. When worlds are at issue, the effect is that these latter worlds ‘exclude the actual world’ (Iatridou, 2000, 247).

Iatridou (2000) does not formalize this idea, but von Prince (2019, 593) supplies a formal definition of ESP ‘English Simple Past’ which is similar in spirit and scope. (18) is a simplified version of that definition which at the same time can serve as a compositional articulation of Iatridou’s exclusion feature.

$$(18) \quad \llbracket \text{PAST} \rrbracket^{w,t} = \lambda p_{s(it)} \lambda w' \lambda t' : w' = w \text{ and } t' < t \text{ or } t' = t \text{ and } w' \neq w . p(w')(t')$$

In the ‘world case’ – that of the second disjunct in the definiens, $t' = t$ but $w' \neq w$ – this amounts to filtering out the world of utterance from the argument proposition (to be exact, the argument world-time relation). When the resulting proposition is the antecedent of a conditional or the argument of *wish*, the exclusion is to induce an implicature that the original proposition fails to contain the actual world.¹⁷

Even if this approach primarily targets counterfactual conditionals, Iatridou’s ExclF or von Prince’s ESP can in principle operate on any proposition (to be exact, any relation between times and worlds). However, like the one of Grosz (2012), the approach is poorly equipped to cope with the facts presented in section 4.

3.3 Presupposing C-D non-inclusion

Building on Stalnaker (1975) (see also section 3.4), von Fintel (1998) proposes that the subjunctive in subjunctive conditionals ‘q if p’ “is not directly about p at all” but marks that the domain of world quantification is partly outside the context set, as defined in (19), where D is the contextually determined modal domain in intension, assigning to the world of evaluation w the set of relevant worlds accessible from it, and C is the context set, the intersection over the Common Ground:

$$(19) \quad \text{subjunctive: } D(w) \not\subseteq C$$

Similarly, Mackay (2019) expounds “the view that a subjunctive conditional carries the presupposition that the modal base for the modal restricted by the *if*-clause ... is a proper subset of the factive common ground”.

(21) gives a compositional articulation of this ‘domain widening’ view (see von Fintel and Iatridou 2021, 32) in the form of a definition of the meaning of the modal past as a function from meanings of dyadic modal operators as functions from, i.e., modal bases, sets of propositions in intension:¹⁸

¹⁷Tellings (2016, 110) supplies two formal articulations of Iatridou’s proposal, one, in tune with (18), subtracting the speaker worlds from the proposition and the other stating that the speaker worlds do not overlap with the proposition; yet another formulation is offered by Karawani (2014, 88). Asarina (2006) offers an implementation and extension of Iatridou’s proposal where the Russian subjunctive particle *by* is ascribed the role of forcing ExclF to range over worlds.

¹⁸‘X-marking’ covers subjunctive or conditional or fake-past marking, following von Fintel and Iatridou (2021).

$$(20) \quad \llbracket \text{X-marking} \rrbracket^{w_0, C} = \lambda M_{s((s((st)t))((st)((st)t)))} \lambda w \lambda f \lambda p \lambda q : \cap(f(w)) \not\subseteq C . M(w)(p)(q)$$

Both [von Fintel \(1998\)](#) and [Mackay \(2019\)](#) only have conditionals in mind, and (21) is tailored to dyadic modal meanings as arguments of the mood, but since what the mood does is add a presupposition in terms of modal base and common ground, it is possible to modify (21) to cover the case of *monadic* modal meaning arguments:

$$(21) \quad \llbracket \text{X-marking} \rrbracket^{w_0, C} = \lambda M_{s((s((st)t))((st)t))} \lambda w \lambda f \lambda p : \cap(f(w)) \not\subseteq C . M(w)(p)$$

In fact, [von Fintel and Iatridou \(2021\)](#) describe the effect of X-marking in relatively general terms – X-marking signals that the modal base is not entirely contained in the set of epistemically accessible worlds – and note that this or a similar constraint should have a wider potential than just accounting for X-marking in conditionals. Particularly, they provide thoughts on how it could be extended to also account for wishes marked as counterfactual, but do not commit to concrete proposals, ending on this note:

Once we broaden our attempts to understand X-marking in non-conditional environments, we see that all existing accounts fail.

In any case, the facts brought to light in the next section, particularly those at issue in section 4.2, prove difficult to reconcile with any theory ascribing a presupposition to the subjunctive in terms of (sets of) propositions and inclusion or overlap relations.

3.4 Antipresupposing (non-)overlap

[Stalnaker \(1975\)](#) proposed that all conditionals carry the pragmatic presupposition that the function f proposed by [Stalnaker \(1968\)](#) selects a member of the context set C as the world most similar to the actual world where the antecedent is true:

$$(22) \quad f(\phi, w) \in C$$

The subjunctive lifts that presupposition: It “is a conventional device for indicating that ... the selection function is one that may reach outside of the context set”.¹⁹

Building on this, [Leahy \(2018, 58\)](#) ascribes a presupposition of overlap between the conditional antecedent and what the speaker knows, roughly corresponding to $\text{DoX}_{\text{speaker}}(w)$ in (16) or E^* in (17), to indicative conditionals:

$$(23) \quad \text{Indicative Presupposition: } \Diamond_s \phi, \text{ “}\phi \text{ is epistemically possible for (speaker) } s\text{”}$$

The opposite relation of non-overlap is derived as a ‘presuppositional implicature’, or antipresupposition.²⁰

This proposal can be seen as a direct formalization of the Stalnakerian idea, and if ‘indicative’ is taken to operate on the antecedent proposition, it can be generalized to many subjunctive contexts. But not to the ones considered in section 4.1.

¹⁹ About “the subjunctive mood in English and some other languages” more generally than just in conditionals, Stalnaker suggests that it is “a conventional device for indicating that presuppositions are being suspended”.

²⁰ As noted by [von Fintel and Iatridou \(2021, 31\)](#), Stalnaker’s “domain-widening idea” is intrinsically present in the so-called ‘past-as-past’ approach to fake past (perfect) in *if* clauses, and [Ippolito \(2003\)](#) in fact appeals to the notion of an implicated presupposition to explain counterfactuality inferences.

4 Two challenging observations

This section presents and discusses two general facts about mood and non-actuality entailments across the four languages Czech, Russian, German and Norwegian, facts which constitute major challenges to existing approaches to non-actuality mood. Firstly, any theory that places the mood at a clausal level, the level of TP, say, and assumes that it operates on propositions will be hard put to accommodate the fact that the marker often appears in a matrix clause – and sometimes only there – while the ‘non-actual’ proposition is expressed in an embedded clause. Secondly, theories that formulate non-actuality inferences as presuppositions will have difficulty with the fact that the inferences can turn negative in contexts of negation.

4.1 The mood in the matrix

In (24)–(27), there is a non-actuality entailment, but this entailment does not concern the proposition expressed in the clause where the subjunctive or fake past (perfect) occurs, it concerns the proposition expressed in an embedded clause.

In (24), the second, subjunctive marked conjunct in the *ačkoliv* ‘although’ clause means that it *is* to be expected that Iceland is a cold country, and also that Iceland is *not* in fact a cold country. Crucially, the clause expressing the content entailed to be non-actual does not have subjunctive but (future) indicative morphology. There is also no subjunctive mood or past tense in the corresponding clauses in the Russian and German examples; the corresponding clause in (27), finally, does feature a fake past, but the matrix clause features a fake past perfect.

- (24) Ačkoliv leží Island téměř na hranici severního polárního kruhu a
although lies Iceland almost at edge northern polar circle and
dalo by se očekávat, že to bude mrazivá zem s tuhými
given is.SUBJ REFL expect that it is.FUT frosty land with harsh
zimami, díky teplému golfskému proudu tomu tak není.²¹ (Czech)
winters due warm golf current that thus not
‘Although Iceland abuts the Arctic Circle and could be expected to be a cold
country with harsh winters, thanks to the warm Golf Stream that is not so.’
- (25) Možno bylo by ožidat, čto na severe oni ne priživutsja, ...²² (Russian)
possible was SUBJ expect that to north they not root-REFL
‘They could have been expected not to take root in Northern parts.’
- (26) Es wäre wünschenswert gewesen, dass Zeugen auch unter Eid
it was.SUBJ wish-worthy been that witnesses also under oath
befragt werden.²³ (German)
interrogated become
‘Ideally, witnesses should have been questioned under oath.’

²¹ Source: <https://musicserver.cz/clanek/22985/makrorecenze-me-su-i-eyrum-vi-spilum-endalaust-sigur-ros/>

²² Source: https://kvsspb.ru/pressa_o_nas/balkon-ili-lodzhiya-chto-luchshe/

²³ Source: https://www.deutschlandfunk.de/es-waere-wuensenswert-gewesen-dass-zeugen-auch-unter-eid.1346.de.html?dram:article_id=221207

- (27) Det hadde vore å vona at det vart meir orden og eit meir
 it had been to hope that it became more order and a more
 tiltrekkande område. No er det langt frå godt nok.²⁴ (Norwegian)
 attractive area now is it far from good enough
 ‘The hope would be that the area might become tidier and more attractive.’

This poses a problem for any theory that seeks to attach a non-actuality entailment, however strong or weak and in whatever way, to a proposition taken as the mood’s argument. From such theories, one would expect a non-actuality entailment to affect the superordinate clause in each of the above examples: that such-and-such is not to be expected, wished, or hoped. And sure, a non-actuality entailment is there, but it affects the *subordinate* clause.

It might be thought that there is a sense in which the content of the matrix is, in each case, implied to be non-actual after all: The expectation, the wish and the hope are, as it were, thwarted, or vain, and so not truly entertained or worth entertaining; the non-actuality of the embedded content could be seen as a consequence of that.

But this reasoning can hardly be extended to data like (28):

- (28) Der Sieg für Hoyerswerda war ein Riesenerfolg, aber auch eine
 the victory for Hoyerswerda was a giantsuccess but also a
 Überraschung für alle Beteiligten. Alle hätten erwartet, **dass die**
 surprise for all involved all had.SUBJ expected that the
favorisierten Leipziger Mannschaften die vorderen Plätze belegen.
 favored Leipzig teams the front places occupy
 Aber bei diesem Pokalwettkampf war alles anders als erwartet.²⁵
 but at this cupcontest was all different than expected
 ‘Everybody had expected the teams from Leipzig to come out on top.’

In this German sentence-in-context, it is evident that the non-actuality entailment only concerns the content of the boldfaced embedded clause and in no way infects the content of the matrix clause, which is untouched by any such implication: The expectation on the part of everybody that the teams from Leipzig would come out on top of the chess tournament is as much of a truth condition as when the mood is not subjunctive but indicative, as indicated in the English paraphrase.

The fact that the mood marking can be ‘upstairs’ while its effect is ‘downstairs’ does not necessarily pose a problem for approaches where the mood manipulates a modal or a modal’s restrictor; recall from section 3.3 that [von Fintel and Iatridou \(2021\)](#) can be taken to take such an approach. The reason is that in each case above, the ‘downstairs’ proposition is the argument of an intensional operator or predicate ‘upstairs’; if now these are the type of entities to populate the mood’s domain, it is reasonable that the mood should reside ‘upstairs’ as well.

We will see in section 5 how a theory can be built on this premise and yield the desired predictions about the ‘downstairs’ propositions.

²⁴Source: https://uskedalen.no/content/uploads/2021/04/Sak_01228.pdf

²⁵Source: <https://www.lr-online.de/lausitz/hoyerswerda/gastgeber-asp-schach-hoyerswerda-schafft-die-sensation-34255076.html>

4.2 Non-actuality entailments turn into actuality entailments

In negative contexts, mood-induced non-actuality entailments are turned around to become actuality entailments. This effect can be observed in the following cases, in Czech, Russian, German and Norwegian, respectively.

- (29) ...vlastně by nebylo nutné je předělávat, mohli jsme použít
...actually is.SUBJ not-been necessary them remake could we use
stávající obsah, ale neučinili jsme tak.²⁶
existing content but not-done we so
'We didn't actually need to reproduce them, we could have used the existing content, but we didn't.'
- (30) Ono tak. Tol'ko ne nado bylo by snosit' starýe istoričeskie zdanija.²⁷
it so only not necessary was SUBJ tear old historical buildings
'Right. Only, the old historical buildings needn't have been demolished.'
- (31) Es wäre nicht nötig gewesen, die Bäume zu fallen.²⁸
it was.SUBJ not necessary been the trees to fell
'The trees needn't have been felled.'
- (32) Jeg hadde ikke trengt å bekymre meg.²⁹
I had not needed to worry REFL
'I needn't have worried.'

The same sentences without the negations would license non-actuality inferences, as would the same sentences with the indicative replacing the subjunctive, while the corresponding sentences with the indicative replacing the subjunctive and without the negations would license actuality inferences; thus the subjunctive reverses the picture that has been observed for past tense modals in languages like French, see [Alxatib \(2021\)](#), [Hacquard \(2021\)](#), [Homer \(2021\)](#), [Jeretič \(2021\)](#).

	INDICATIVE	SUBJUNCTIVE
POSITIVE	Actuality	Non-Actuality
NEGATIVE	Non-Actuality	Actuality

Table 1: Past tense (non-epistemic) modals: (Non-)Actuality inferences

It may seem conspicuous that all four examples involve necessity modals. Indeed, when possibility modals have realistic conversational backgrounds, actuality entailments will contradict the main, at-issue content of the negated sentence. However,

²⁶<https://www.zoochleby.cz/news/karty-zvirat-na-webu-398/>

²⁷<https://ok.ru/group53875099959535/topic/152972489915887>

²⁸<https://www.bernerzeitung.ch/es-waere-nicht-noetig-gewesen-die-baeume-zu-faellen-557598063535>

²⁹<https://ieuropa.no/2015/02/en-smak-av-resesjon-osterrike/jennifer/>

when they have normative or teleological ordering sources, actuality inferences are consistent with the truth conditions of the negative statement and will surface, as in (33), which clearly licenses the inference that an event of the type referred to by the pronoun *das* ‘that’ has in fact occurred.

- (33) Das hätte nicht passieren dürfen!³⁰ (German)
 that had.SUBJ not pass may
 ‘That shouldn’t have happened!’

The theory laid out in the next section brings out why actuality entailments fail to surface when they would conflict with the main content of the negated sentence: there are no ‘innocently excludable alternatives’ to be (doubly) negated.

The actuality entailment is problematic for any analysis which ascribes a non-actuality *presupposition*, however weak, to the mood, because any presupposition would have to remain unaffected by an anti-additive functor like a negation adverb, projecting past it. Conversational implicatures, on the other hand, are sensitive to negation, so the data rather point towards a treatment of the non-actualistic mood in such terms; more evidence in that direction is provided in the next section.

5 The novel move: The mood modifies modals

This section sets out an account of non-actualistic mood that meets the challenges identified in section 4. It is rather different from any existing account, yet it shares features with two of the approaches to similar ‘grammemes’ surveyed in section 3, firstly, regarding the scope, secondly, the effect of the mood:

- It develops further the outlook of [von Stechow and Iatridou \(2021\)](#) on X-marking to let the mood operate on the meaning of any modal,³¹
- it has in common with the view of [von Stechow \(2019\)](#) on the modal past tense that the mood is taken to give rise to an implicature.

Set in the theory of alternatives and exhaustification developed by [Chierchia \(2013\)](#) a.o., the account to be presented treats the mood as a means to contrast the modal in its scope with one special alternative – the identity function over propositions.

Section 5.1 lays some groundwork for the account in relatively informal terms, section 5.2 supplies formal definitions and the derivation of a simple paradigm case, and section 5.3 shows how the two ‘problem cases’ considered in section 4 are not problematic but straightforwardly predictable on this account. Section 5.4, finally, offers thoughts on the morphosyntax of the mood under the account.

5.1 Non-actuality entailments as implicatures

The leading idea is that the mood activates alternatives to the modal it operates on, particularly one: the ‘null modal’, denoting the identity function over propositions; exhaustification with respect to this alternative yields the non-actuality entailment.

³⁰<https://www.wallstreet-online.de/nachricht/13831052-halliburton-passieren-duerfen>

³¹A conditional operator restricted by an antecedent clause is in this connection a modal.

The status of this entailment is, then, as a non-conventional implicature within the ‘grammatical theory’ of implicatures (see, e.g., Chierchia et al 2012). This theory has mainly been employed for computing scalar implicatures and for deriving NPI licensing conditions (see Chierchia 2013, 143ff.). Here, alternatives are activated by lexical items, scalar terms or NPIs, and at propositional level, the relations between these items and the activated alternatives play out as differences in logical strength. This is not an essential feature of the theory, however; implicatures that are based on ‘non-logical scales’ or on contrastive topichood can be computed with the same procedure, activation and exhaustification presupposing ‘innocent exclusion’ (Fox, 2007) and respecting ‘various contextual considerations’ (Chierchia et al, 2012).

While (34) illustrates an implicature based on a logical scale, (35) illustrates one based on a non-logical scale – non-logical because it is possible to shoot somebody without having threatened to do so (and vice versa).

(34) Many of them are poultry ...³²

↪ not all of them are

(35) Hedda threatened to shoot Løvborg at the time, ...³³

↪ she did not shoot him

In both cases, characteristically, the implicature can felicitously be confirmed in the immediately subsequent discourse:

(36) Many of them are poultry but not all of them.³²

(37) Hedda threatened to shoot Løvborg at the time, but at last didn’t.³³

Notably, the non-actuality entailment associated with the subjunctive and fake past (perfect) in, say, German shows the same behavior, cf.:

(38) ... – der Täter hätte es wissen müssen, hat es aber nicht gewusst – ...³⁴

... – the agent had.SUBJ it know must has it but not known – ...

‘... the perpetrator ought to have known but didn’t.’

This is another piece of evidence for a treatment of the non-actuality entailment as an implicature (one piece, its sensitivity to negation, was presented in section 4.2).

Such a treatment will involve defining – through a definition of the alternative to the mood – the ‘null modal’ as the alternative to the modal, and ultimately, the proposition expressed by the sentence without the modal as the alternative to the proposition expressed by the sentence with the modal. Now the relation between the modal – in (38), *müssen* – as modified by the mood and its putative alternative, the ‘null modal’, is not scalar in a logical sense: the proposition expressed by (38) – before any implicature of non-actuality is factored in – and the prejacent, viz., that the perpetrator in fact knew, are not ordered by strength. Still, a case can be made that, on the one hand, what ought to be the case, etc., and, on the other, what is in fact the case form a natural scale in a non-logical sense of conceptual strength.

³²Source: <https://www.producer.com/livestock/destined-to-fail/>

³³Source: <https://www.litcharts.com/lit/hedda-gabler/summary>

³⁴Source: <http://criminnet.ugr.es/recpc/10/recpc10-01vo.pdf>

Against this background, the gist of the proposed account can be outlined thus: The potential contrast between two scalemates where one is a modal, any modal – say, a conditional operator restricted by the antecedent clause, see section 6 – and the other is the ‘zero modal’, in effect the ‘actual’ world, is made an actual contrast when the mood applies to the modal, activating the zero modal alternative. A non-actuality entailment comes about as an implicature – as added content brought on by the exhaustification operator *O*, coming into play just in case the added content is compatible with the content it is added to as well as with the context.

The proposal will presently be spelt out in compositional detail.

5.2 Definitions and a case study

Taking a cue from [von Stechow and Iatridou \(2021\)](#), I will represent the non-actualistic mood across the four languages under consideration by an uppercase *X*, neutrally as to whether it is articulated with mood or tense morphology, or with both.

In the framework of alternatives and exhaustification developed and advanced by [Chierchia \(2006\)](#), [Fox \(2007\)](#), [Chierchia et al \(2012\)](#), [Chierchia \(2013\)](#) and others, meanings have two separate dimensions: the ordinary semantic value (or OSV, $\llbracket \cdot \rrbracket$) and the alternative semantic value (or ASV, $\llbracket \cdot \rrbracket^A$), a set of alternatives to the former. To start with, here are the definitions of the two semantic values of *X*:³⁵

$$(39) \quad \llbracket X \rrbracket = \lambda \mathcal{P}_{(st)(st)} \mathcal{P}$$

$$(40) \quad \llbracket X \rrbracket^A = \{ \lambda \mathcal{P}_{(st)(st)} \mathcal{P}, \lambda \mathcal{P}_{(st)(st)} \mathbb{D}_{(st)(st)} \}$$

Let us focus on a simple example, the Russian sentence (41):

- (41) Staryj dub nužno bylo by srubit'.³⁶
 old oak necessary was SUBJ cut.PF
 ‘The old oak should have been felled.’

There is a non-actuality entailment here: the old oak has not been, or was not, felled. Let us now build the meaning of the sentence in accordance with the rudimentary Logical Form in (42) to see how this entailment is derived.

O is the name of the covert exhaustification operator attaching to the sentence at the top level, and its sister’s two daughters are,

- on the one hand, the join of the necessity modal *nužno* and the mood *X*,
- and on the other, the prejacent infinitival clause:

$$(42) \quad [O \llbracket [nužno] [X] \rrbracket [PRO srubit' staryj dub]]]$$

³⁵I use here an ‘intensional’ scheme of composition where, say, the meaning of a modal is a function from propositions to propositions; the alternative of pointwise extensional composition, where the meaning of a modal is a function from worlds to sets of propositions, would be possible but less perspicuous when alternative semantic values are composed.

³⁶The paraphrase represents one reading of the sentence; it can in addition be read as an elliptic anankastic conditional, see section 6.2, corresponding to a paraphrase like ‘the old oak would have had to be felled’, and it can also have future time reference, see section 7.1, corresponding to a paraphrase like ‘the old oak should be felled’ or ‘the old oak would have to be felled’. Note, too, that the corresponding sentence without the subjunctive particle can also be read in the sense of the paraphrase, but that in contrast to the sentence with *by*, (41), it can also mean that the oak had to be – and was – cut down. – The judgments are validated by Solomeya Bagautdinova.

First, since the ordinary semantic value of the mood X is the identity function over propositional operations, the ordinary semantic value of the merge of the mood and its argument *nužno* ‘necessary’ equals this argument:

$$(43) \quad \llbracket X(nužno) \rrbracket = \llbracket nužno \rrbracket$$

Second, to calculate the alternative semantic value (ASV) of that merge, we need the rule of Pointwise Function Application (Chierchia, 2013, 138):

$$(44) \quad \llbracket a(b) \rrbracket^A = \{ \gamma \mid \text{there is a } \alpha \in \llbracket a \rrbracket^A \text{ and a } \beta \in \llbracket b \rrbracket^A \text{ such that } \gamma = \alpha(\beta) \}$$

Using this, since the ASV of *nužno* itself is just the singleton set containing its OSV, there being no distinct alternatives, we obtain (45):

$$(45) \quad \llbracket X(nužno) \rrbracket^A = \{ \llbracket nužno \rrbracket, \mathbb{D}_{(st)(st)} \}$$

Let us now say that the ordinary and alternative semantic values of the infinitival argument of $X(nužno)$, with an indefinite PRO subject and a free variable t referring to a contextually given past time t , are the proposition in (46) and the singleton set containing that proposition in (47).

$$(46) \quad \llbracket t \text{ PRO } srubit' \text{ staryj dub} \rrbracket = \\ \lambda w. \text{ someone fells the old oak at } t \text{ in } w$$

$$(47) \quad \llbracket t \text{ PRO } srubit' \text{ staryj dub} \rrbracket^A = \\ \{ \lambda w. \text{ someone fells the old oak at } t \text{ in } w \}$$

The next to last move in the composition of the meaning of (41) is the interpretation of the merge of $X(nužno)$ and its argument, given in (48) – the OSV, a proposition – and (49) – the ASV, a set of two propositions.

$$(48) \quad \llbracket X(nužno)(t \text{ PRO } srubit' \text{ staryj dub}) \rrbracket = \\ \llbracket nužno \rrbracket(\lambda w. \text{ someone fells the old oak at } t \text{ in } w)$$

$$(49) \quad \llbracket X(nužno)(t \text{ PRO } srubit' \text{ staryj dub}) \rrbracket^A = \\ \{ \llbracket nužno \rrbracket(\lambda w. \text{ someone fells the old oak at } t \text{ in } w), \\ \lambda w. \text{ someone fells the old oak at } t \text{ in } w \}$$

In a last step before the sentence meaning is finished, the activated alternatives in (49) will have to be factored into meaning through exhaustification, more exactly, it will be necessary for an exhaustification operator (called Exh or O, for ‘only’) to exhaustify the meaning in (48) with respect to the alternatives. The exhaustification amounts to adding a condition to (48) saying that its distinct alternative is not true. The definitions of the contribution of the exhaustifier O to OSVs and to ASVs (alternatives are reset once they are factored into OSVs through O) given in (50) and (51) are based on Chierchia (2013, 138), but the notation is adapted.

$$(50) \quad \llbracket O p \rrbracket = \lambda w. w \in \llbracket p \rrbracket \text{ and for all } \phi \in \llbracket p \rrbracket^A \text{ such that } \llbracket p \rrbracket \not\subseteq \phi, w \notin \phi$$

$$(51) \quad \llbracket O p \rrbracket^A = \{ \llbracket p \rrbracket \}$$

Now we can compute the final OSV of (41). Since exactly one of the two alternatives ϕ in $\llbracket p \rrbracket^A = (49)$ fails to include $\llbracket p \rrbracket = (48)$, namely, the proposition that someone did fell the old oak, this proposition is subtracted from – or, put differently, its complement is intersected with – $\llbracket p \rrbracket = (48)$, resulting in (52):

$$(52) \quad \llbracket O(X(nužno)(t \text{ PRO } srubit' \text{ staryj } dub)) \rrbracket = \\ \llbracket nužno \rrbracket(\lambda w. \text{ someone fells the old oak at } t \text{ in } w) \cap \\ \lambda w. \text{ noone fells the old oak at } t \text{ in } w$$

In other words, the non-actuality inference that noone felled the old oak is now indeed an entailment, an integrated truth condition.

In due time, we will see how the entailment becomes an *actuality* entailment when a negation intervenes between the exhaustifier and the mood (section 5.3.2) and how it is blocked when it would conflict with the original OSV (section 5.3.2) or with an additive presupposition (section 6.3).

5.3 The two problem cases

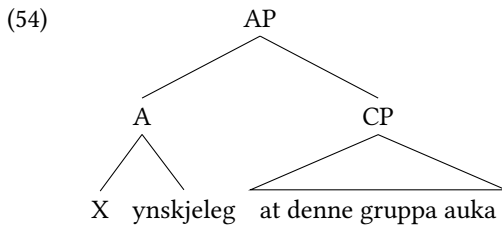
The two phenomena which cause particular difficulties for existing approaches, as set out in section 4, are straightforwardly accounted for by the given analysis.

5.3.1 The mood sits right

The circumstance that the mood can be marked in a matrix while the non-actuality entailment concerns a subordinate clause does not present a problem because the mood is not a ‘spinal’ category and does not apply to a proposition; it applies to a modal and sets off a non-actuality entailment for the modified modal’s argument, which can perfectly well be expressed in a subordinate CP.

As indeed it is in the Norwegian example (55), with the LF sketched in (54): the mood modifies the modal *ynskjeleg* and the result takes a ‘that’ clause complement.

- (53) Det hadde vore ynskjeleg at denne gruppa auka, ...³⁷
 it had been wishable that this group increased ...
 ‘It would have been desirable for this group to grow, ...’



It may be noted that there is a fake past marking in the subordinate clause as well, though not a past perfect marking as in the matrix clause; like the X marking in ‘if’ clauses, this can be viewed as an uninterpretable concord marking (see section 6.1).

³⁷https://www.vestnes.kommune.no/_f/p1/ifbb5885f-ae2f-4fc9-9734-35aaa0a0e0d3/omsorgsplan.pdf

5.3.2 Exhaustification over negation

Like the sentences (29)–(32) discussed in section 4.2, the Norwegian sentence (55) has an actuality entailment for the complement clause: ‘I quit.’

- (55) Det hadde ikkje vore naudsynt at eg sluttar.³⁸
 it had not been necessary that I quit.PRES
 ‘There is no need for me to do this, quit.’

This is immediately predicted by the present analysis on the reasonable assumption that the negation scopes over the mood-modified modal but under the exhaustifier *O*; in this way, the non-actuality entailment which would otherwise be there turns into an actuality entailment:

- (56) $\llbracket O(\textit{ikkje}((X(\textit{naudsynt}))(at\textit{eg\sluttar}))) \rrbracket =$
 $\llbracket \textit{ikkje} \rrbracket(\llbracket \textit{naudsynt} \rrbracket(\lambda w. I\textit{quit\ in\ }w)) \cap \lambda w. I\textit{don't\ not\ quit\ in\ }w$

On the other hand, as noted in section 4.2, when combined with possibility modals with empty ordering sources, *X* fails to license actuality inferences under negation, and we can see now why: The definition of the ordinary semantic value of *O* in (50) restricts the exclusion of alternatives ϕ to propositions that do not include $\llbracket p \rrbracket$, and when $\llbracket p \rrbracket$ is that in view of the circumstances, something is not possible, ϕ will be that this something is not the case, which indeed includes $\llbracket p \rrbracket$, consequently, $\llbracket p \rrbracket$ fails to be excluded, and *X* has no effect.

And in fact, there is hardly any detectable difference in meaning between (57-a), with past perfect subjunctive, and its past indicative counterpart (57-b).

- (57) a. ...ein Wiederaufbau wäre nicht möglich gewesen.³⁹ (German)
 ...a reconstruct was.SUBJ not possible been
 ‘Rebuilding was out of the question.’
 b. ..., ein Wiederaufbau war nicht möglich.⁴⁰
 ..., a reconstruct was not possible
 ‘Rebuilding was out of the question.’

5.4 A note on the syntax of the mood

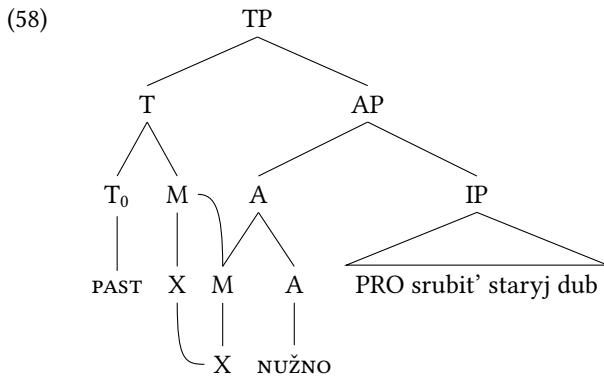
Recall from section 2.1.1 that the non-actualistic mood is marked in various ways across Czech, Russian, German and Norwegian, often with a combination of mood (subjunctive) and tense (past or pluperfect) marking, where the mood marking may be verbal inflection or a particle or clitic, and sometimes with tense marking alone. This morphological realization must somehow be enabled in the syntax, and while there are several ways to go about it (see, e.g., Harizanov and Gribanova (2019) for a discussion of the general issues), I will adopt a simple version of head movement, where *X* merges internally into *T*.

³⁸<https://www.fjordabladet.no/nyhende/2018/05/21/Avviklar-butikken-16739116.ece>

³⁹<https://www.kakteenforum.com/t28633-ein-princess-gewachshaus-soll-es-sein>

⁴⁰https://www.nw.de/lokal/kreis_hoexter/hoexter/6581220_Felsenkellerruine-ein-Dorn-im-Auge.html

(58) supplies an illustration of the syntax of the Russian paradigm example (41), elaborating on the rudimentary structure in (42) but omitting the insertion of O.

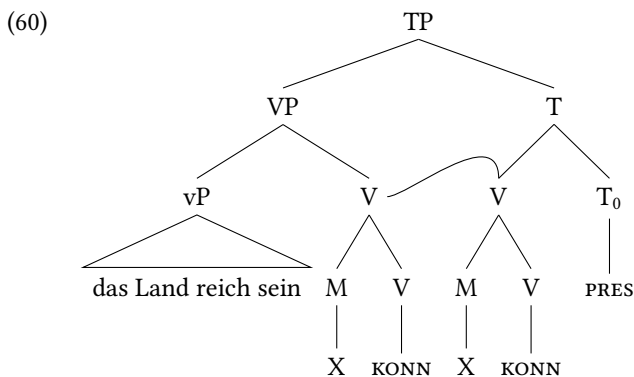


The material dominated by T – PAST and X – spells out as *bylo* and *by*, i.e., the past (neuter) form of the copula and the subjunctive particle.⁴¹

The German case (59) is a bit different insofar as the mood comes to expression in an *umlaut*, finite form of a verb, the modal auxiliary *können* ‘can’, ‘may’, and the basic structure is right-branching:

- (59) ..., obwohl das Land eigentlich reich sein könnte.⁴²
 ..., although the country actually rich be can.PAST.SUBJ
 ‘..., although the country could have been rich.’

The form *könnte* thus spells out three elements: the mood (X), the finite verb’s root (KONN) and the tense (PRES) (plus person-number agreement, third person singular):



In Czech and Norwegian, the T material will regularly have a complex articulation, a finite ‘backward-shifting’ auxiliary and a participle, in Czech from the subjunctive stem paradigm, in Norwegian in the past tense form.

⁴¹The assumption is that the copula is not a V but a spellout of a T without a V but with PAST or X or both (or FUT).

⁴²Source: <https://religion.orf.at/v3/radio/stories/3006043/>

The non-actualistic mood has been defined as an operator that operates on modals (see section 5.2, in particular (39)). The notion of a modal is general: any expression with a denotation of type $(st)t$ or, in the composition scheme adopted in section 5.2 (see footnote 35), a meaning of type $(st)(st)$, mapping a proposition to a truth value or to another proposition. Such an expression may now be silent, more accurately, it may be that all that's audible of it is an 'if' clause; then the 'modal' is, following Kratzer, a silent necessity operator whose modal base is restricted by that clause or, following Lewis, a binary conditional operator halfway saturated.

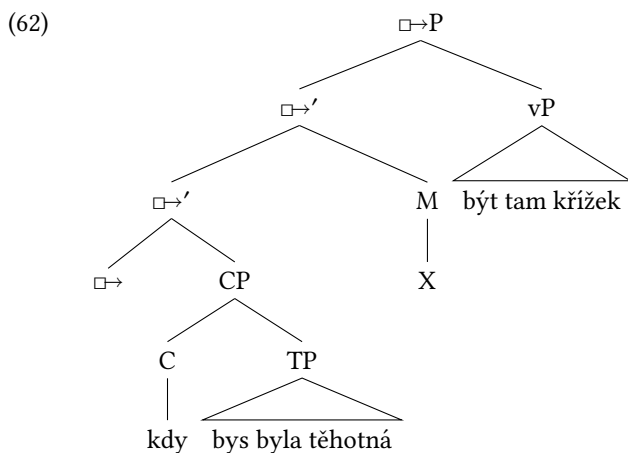
In any case, we get a conditional, and if the non-actualistic mood *X* applies, it applies to the unary propositional operator that inputs the conditional consequent. In consequence, a non-actuality entailment will standardly be derived for this, the consequent, and in principle, nothing will be said about the antecedent. However, if a non-actuality entailment is indeed derived for the consequent, together with it the conditional will entail that the antecedent is non-actual too, per *modus tollens*. It can happen, though, that a non-actualistic entailment fails to get off the ground; this is the situation with ‘semifactuals’, where the alternative is ‘non-excludable’.

These and further issues are treated in more detail in the following subsections.

Consider the Czech sentence (61):

- (61) Kdybys byla těhotná, byl by tam křížek.⁴³
if-are.SUBJ.2SG been.F pregnant been is.SUBJ there cross
'If you were pregnant, there would be a plus sign.'

It can be assigned an LF as sketched in (62), broadly following Lewis (1973):



⁴³Source: <https://www.zenysro.cz/blogy/vztahy-a-partnerstvi/dve-carky-povidka-dozvedet-se-vysledek-nemusi-byt-vzdvycky-vyhra>

That the non-actuality of the antecedent is only indirectly predicted when that of the consequent is implicated accords well with one of two arguments put forth by Stalnaker (1975) against a presupposition that the antecedent is non-actual:⁴⁴

Consider the argument, The murderer used an ice-pick. But if the butler had done it, he wouldn't have used an ice-pick. So the murderer must have been someone else. The subjunctive conditional premiss in this modus tollens argument cannot be counterfactual since if it were the speaker would be blatantly begging the question by presupposing, in giving his argument, that his conclusion was true.

While any theory where antecedent falsity is presupposed is indeed challenged by this argument, the hypothesis that antecedent falsity follows from the implicature of consequent falsity and the truth of the conditional as a whole is, on the contrary, strengthened by it, as the argument simply spells out that same sequitur.

6.2 Elliptical counterfactuals

A further argument in support of the proposal comes from sentences like (3), (4), (5) and (6), repeated here for convenience:

- (3) Jeg hadde vært død nå.⁴⁵
I had been dead now
'I would be dead now.'
- (4) Ich wäre jetzt tot!⁴⁶
I was.SUBJ now dead
'I would be dead now!'
- (5) Ja byl by sejčas mervt.⁴⁷
I was SUBJ now dead
'I would be dead now.'
- (6) Byl bych ted' mrtvý...⁴⁸
been am.SUBJ now dead
'I would be dead now.'

The only way to read these sentences is as concealed, or elliptical, counterfactuals, and this receives a straightforward explanation under the proposed analysis.

Note that there is no modal of any kind in these sentences – no overt modal at any rate. However, the mood presupposes a modal of some kind insofar as it needs one to apply to, hence one must assume the covert presence of one. And the only kind of modal that can be covert, according to Kratzer (1978) and much later work, is the necessity modal that appears as the default operator in conditionals, where it is restricted by the antecedent –which in (3)–(6) is a zero pronoun. In this way, the mood sets off a chain of interpretive moves ending in a complete counterfactual.

⁴⁴The other argument is discussed in section 6.3.

⁴⁵Source: <https://khrono.no/nord-universitet-ovelse/skremmende-realistisk-terror-ovelse-pa-nord/141072>

⁴⁶Source: <https://www.wochenblatt.de/archiv/wie-viele-unfaelle-muessen-hier-noch-passieren-61847>

⁴⁷Source: Galina Gončarova, *Učít'sja, vljubit'sja... ubit'sja?*

⁴⁸Source: <https://adoc.pub/no-title32e911e5848cc10af0cfed401f068c3e69321.html>

6.3 Semifactuals and Anderson cases

It has often been noted that the consequent can stay untouched by any non-actuality inference from conditionals. This is particularly so with *semifactuals*, which contain a focus particle ‘even’ or an additive adverb ‘still’ associating with the ‘if’ clause, or more precisely, the conditional operator incorporating the ‘if’ clause, and triggering the presupposition of the same sentence under the substitution of the alternative – effectively, the actual world – for the associate.

The upshot is an actuality presupposition for the consequent. That this blocks any non-actuality entailment originating in the mood falls out naturally from the proposed analysis, once the definition of the exhaustification operator is modified to accommodate presuppositions. The key point is that the alternative whose exclusion is key to the non-actuality entailment turns out not to be excludable.

In the modified definition (66), the meaning of the sentence the exhaustifier *O* combines with is treated as a partial function from worlds to truth values, and the restriction of alternative semantic values to ‘innocently excludable’ ones is stated in terms of the sets of worlds where ϕ and p are true:

$$(66) \quad \llbracket O p \rrbracket^w = \begin{cases} 1 \text{ iff } & \llbracket p \rrbracket^w = 1 \text{ and } \phi^w = 0 \text{ for all } \phi \in \llbracket p \rrbracket^A \text{ such that} \\ & \lambda w' \llbracket p \rrbracket^{w'} = 1 \not\subseteq \lambda w'' \phi^{w''} = 1, \\ 0 \text{ iff } & \llbracket p \rrbracket^w = 0 \text{ and } \phi^w = 1/0 \text{ for all such } \phi, \text{ or} \\ & \llbracket p \rrbracket^w = 1 \text{ and } \phi^w = 1/0 \text{ for all and } 1 \text{ for some such } \phi \end{cases}$$

When *O* applies to a sentence like (67), with the additive adverbial associating with the conditional modal, including the ‘if’ clause, there will be no innocently excludable alternatives, that is, no $\phi \in \llbracket p \rrbracket^A$ such that $\lambda w' \llbracket p \rrbracket^{w'} = 1 \not\subseteq \lambda w'' \phi^{w''} = 1$, hence no non-actuality entailment will come about.

- (67) Esli by Sundbju ne upal, vse ravno obošel by ego.⁴⁹ (Russian)
 if SUBJ Sundby not fell all same bypassed SUBJ him
 ‘If Sundby hadn’t fallen, I’d still have overtaken him.’

For if the additive adverbial has the null modal as the alternative to its associate, it causes p to presuppose the consequent, so the only distinct alternative to p – again the consequent – will include the set of worlds where p is true, leaving *O* inert.

More concretely, let us say that in (67), *vse ravno* introduces the presupposition that Ustjugov overtook Sundby in the salient alternative to the relevant accessible worlds where Sundby didn’t fall, and that this alternative is the world of evaluation, where Sundby did fall; (67) is thus only true if Ustjugov did overtake Sundby. According to (66) now, alternatives to (67) must be false for (67) to be true provided the worlds where they are true do not include the worlds where (67) are true – but no such alternatives exist: there are two, one is (67) itself, which trivially fails the proviso, and the other is the proposition that Ustjugov did overtake Sundby, which coincides with a necessary, not sufficient truth condition for (67). No non-actuality condition is thus forthcoming, for lack of ‘innocently excludable’ alternatives.

⁴⁹Source: https://vk.com/wall-101982925_3603203; I = Sergej Ustjugov

This reasoning carries over to cases where the consequent is evidently true, even in the absence of additive particles or adverbs. Such cases include so-called ‘arsenic cases’, or ‘Anderson cases’, with reference to [Anderson \(1951\)](#): subjunctive conditionals used in support of the truth of the antecedent.

Authentic examples are not easy to find, but (68) is one.

- (68) Ist die Feder der Drosselklappe da? Die Symptome wären gleich,
 is the spring the.GEN throttlevalve there the symptoms were.SUBJ equal
 wenn sie fehlen würde.⁵⁰ (German)
 if they miss would
 ‘Is the throttle valve spring in place? Those would be the symptoms if it was missing.’

As in the examples constructed by Anderson, the consequent is an *a priori* truth – a proposition true in every world of utterance: the symptoms of some engine are the same as they are in the world of utterance. As a set of worlds where that is true and an alternative to the conditional activated by the subjunctive mood, it includes any set of worlds, *a fortiori* the set of worlds where the conditional is true, so that the proviso built into the definition of the exhaustification operator cannot be satisfied; consequently, nothing about the truth or falsity of the consequent can be concluded, and hence, nor anything about the truth or falsity of the antecedent.

6.4 Fabricius conditionals

Consequents that presuppose antecedents are a challenge to the proposed analysis. Conditionals like (69) are cases in point; they can be called Fabricius conditionals because they (or to be accurate, German indicative conditionals otherwise like (69)) were first drawn attention to by [Fabricius-Hansen \(1980\)](#).

- (69) Tolik se nesleduj, kdybys byla těhotná, test by to ukázal.⁵¹
 so-much self not-watch if-are.SUBJ been pregnant test is.SUBJ it shown
 ‘Don’t watch yourself so much, if you were pregnant, the test would show it.’

They are challenging because the predicted non-actuality entailment, denying the consequent, would seem to presuppose the antecedent; in the case at hand:

- Antecedent: that you are pregnant
- Consequent: that the test shows that you are pregnant
- Non-actuality entailment: that the test does not show that you are pregnant

And that would conflict with the inference that the hearer is not pregnant.

But according to the theory of presupposition propounded by [Schlenker \(2008\)](#), the semantics of *pq* (i.e., *q* with *p* as a presupposition) is the same as that of *p&q*, but the pragmatics is different: in order to comply with the maxim “Be Articulate!”, *p&pq* is preferred over *pq* unless *p* is ‘transparent’.⁵²

⁵⁰Source: <http://w201-ev.de/forum/index.php/Thread/28127-W124-Leistungsverlust-bei-Vollast-ruckeln-bei-Teilast/>

⁵¹<https://www.emimino.cz/diskuse/zpozdeni-menstruace-5-dni-407120/>

⁵²That *p* is transparent means that it is redundant given the context set and the local context.

Now as it happens, *p* is indeed transparent in the local context of a conditional consequent where *p* is entailed by the antecedent. Therefore, $\underline{p}q$ is the same as $p \& q$ pragmatically and semantically, and (69) is equivalent with

(70) if you were pregnant, you'd be pregnant and the test would indicate it

where the presuppositional verb *show* is replaced by the non-presuppositional verb 'indicate'. – This move saves (69) from any semblance of contradiction and explains how the antecedent is inferred to be false even if the consequent appears to presuppose it.

7 Discussion: Challenges

The proposed analysis leaves open some questions. These concern (i) the weakened non-actuality entailments that can be observed in cases of future time reference, (ii) a compositional dilemma when the mood seems to apply to a propositional attitude predicate instead of a full-fledged modal, and (iii) cases where apparently, the mood occurs in sentences without modalization. Some tentative answers are given below, but definitive answers will mostly have to await further research.

7.1 Non-actuality and future

There is a consensus in the literature that non-actuality entailments rooted in mood are less categorical when the temporal reference is to the future than when it is to the past or the present. Dobrušina (2016, 35, 13) thus writes:

Budušće, kak èto neodnokratno obsuždalos' v lingvistike, ne isključaet realizaciju nikakih, daže samyh neverojatnyh situacij (naprimer, "we cannot have a counterfactual to the future as the future is conceptualized as not yet fact" – Iatridou 2000).

The future, as has been repeatedly discussed in linguistics, does not exclude the realization of any, even the most improbable, situations (for example, "we cannot have a counterfactual to the future as the future is conceptualized as not yet fact" – Iatridou 2000).

V strogom smysle slova v slučae referencii k buduščemu možno govorit' liš' o nizkoj verojatnosti osušestvlenija situaciji, a ne o ee kontrfaktivnosti, ...

In the strict sense of the word, in the case of a reference to the future, one can only speak of a low probability of the situation occurring, and not of its counterfactuality, ...

In the same spirit, (Fabricius-Hansen et al, 2018, 56) write:

...Konjunktiv hat bei Gegenwartsbezug des Modalverbs ...einen geringeren Effekt als bei vergangenheitsbezogener Modalisierung.

...When the modal auxiliary refers to the present, the effect of the subjunctive is weaker than when the modalization has past time reference.

This reduced non-actuality effect could be modeled in terms of quantification over possible continuations in branching time (see, e.g., Condoravdi 2002 and Stojanović 2014). Actually doing so would take us too far afield in the present context, but let us take a close look at a case in point to get a somewhat clearer picture of the facts:

- (71) Man müsste sofort anfangen, Treibhausgasemissionen zu reduzieren. Derzeit sind wir aber auf einem Weg, der das eigentlich nicht anzeigt.⁵³ (German)
 one must.PAST.SUBJ immediately begin greenhousegasemissions to reduce presently are we but on a way which that actually not indicates
 ‘It is imperative to start reducing greenhouse gas emissions at once, but at present we are not heading in that direction.’

The continuation to the modalized, mood marked sentence makes two points clear:

- It cannot be excluded that greenhouse gas emission reductions begin immediately, that is, some continuation of the actual world is contained in the prejacent,
- however: We are not on course for that, in other words, those continuations are not among those where events take their natural course, the ‘inertia worlds’ – see Dowty (1979, 148) for a locus classicus of this notion.

Thus one might say that the non-actuality entailment induced by the non-actualistic mood plays out as the negation of the prejacent relative to the inertia worlds as far as future time reference is concerned.

7.2 A composition problem: type (st)(et) ‘modals’

It has been assumed that the mood needs to compose with something of the logical type of a modal – anything with a meaning mapping one proposition onto another (or a world to a set of propositions). This assumption faces a problem when by all accounts, there is an expression with a modal meaning for the mood to merge with, but that meaning maps a proposition to a *function from individuals to propositions* (or a world to a function from propositions to sets of individuals). Specifically, the mood would seem to attach to a propositional attitude predicate. (28) in section 4.1 was one case in point, and (72) is another.

- (72) Sie hätte ihn küssen wollen, hielt sich aber zurück.⁵⁴ (German)
 she had.SUBJ him kiss wanted held herself but back
 ‘She wanted to kiss him but restrained herself.’

As observed in connection with (28) and as can be noted here, the expectation and the wish are real – the non-actuality inference concerns the complement clause in (28) and the control infinitival argument of the auxiliary *wollen* in (72). That would follow if the mood could apply to the attitude (auxiliary) verb after this has applied to the individual subject argument but before it applies to the proposition, but that runs counter to any conventional semantics for propositional attitudes.

There are three possible solutions to this dilemma:

1. Define another variant of $\llbracket X \rrbracket$, one that inputs functions from propositions to functions from individuals to propositions instead of propositions, and a

⁵³Source: <https://blogs.helmholtz.de/kuestenforschung/2018/10/30/klimawandel-wie-die-nordsee-sich-veraendert/>

⁵⁴Source: Charlotte Roth, *Die ganze Welt ist eine große Geschichte und wir spielen darin mit*

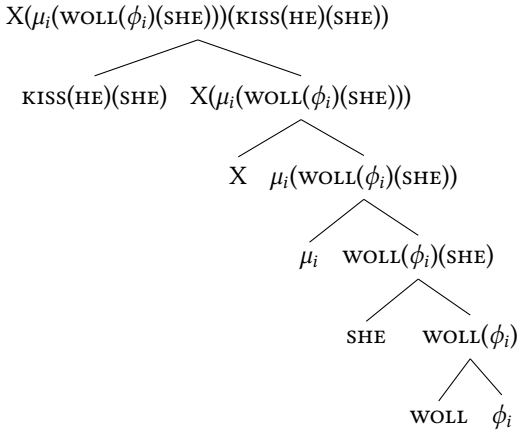
corresponding variant of $\llbracket X \rrbracket^A$:

$$\llbracket X \rrbracket^A = \{ \lambda P_{(st)(e(st))} P, \lambda P_{(st)(e(st))} \lambda p \lambda x p \}$$

- introduce another composition principle, additionally to functional application, etc., to take care of the composition of X and a propositional attitude predicate:

$$\llbracket \alpha_{((st)(st))((st)(st))} \beta_{(st)(e(st))} \rrbracket = \lambda p_{st} \lambda x_e \llbracket \alpha \rrbracket (\lambda q_{st} \llbracket \beta \rrbracket (q)(x))(p)$$

- LF raise the complement clause and attach X below that but above the associated variable binder – as in this rudimentary LF for (72):



μ abstracts over the variable left by the raised complement clause $\text{KISS}(\text{HE})(\text{SHE})$ and thus creates the appropriate logical type for X to apply to.

All three solutions have some theoretical cost to them, but in a general perspective, all three also have precedents in the literature; for example, the first one is matched by the split adnominal/adverbial treatment of the intensifier *-self* by Eckardt (2001), the second has a model in the rule for combining transitive verbs with quantifiers defined by Barwise and Cooper (1981), and the third broadly mimics the generalized notion of QR employed by Grønn and von Stechow (2016) in connection with tense.

7.3 Antecedents without consequents, lone X clauses

Intro

7.3.1 Optatives

Isolated ‘if’ clauses as optatives

‘If’ clause optatives as elliptical Fabricius conditionals (contra Grosz (2012, 110): “both if-optatives and that-optatives are truly independent and do not involve matrix clause deletion”)

Well, not deletion, you don’t need the consequent, but you do need the default modal

Optative ‘if’ clauses in German and Norwegian: An anaphoric consequent, ellipsis here deep anaphora, can have a default, ideal-preferential value, but can also contextually resolved – exophoric use possible? (wären wir nur früher/eher los..., schneller ..., rechtzeitig ..., bloß nicht so lange ..., hätten wir nur besser aufgepasst, ein besseres ..., sie sich bloß nicht umgedreht)

Hätte ich bloß Geld :(Source: <https://www.facebook.com/2277074489235310/posts/2966485773627508/>

Wenn ich nur ein paar Jahre jünger wäre!

hadde vi bare hatt penger / vært yngre / vært frisk

The two modes of resolution may well be distinguished intonationally (! versus ...)

Hvis du bare hadde visst hvor slitsomt det er å amme hele natten. (<https://www.agderposten.no/magasin/utdrag-fra-mammasjokket/>)

Bech (1951, 25): Bisweilen ist der kdyby-satz mit keinem übergeordneten satze verbunden. Es muss dann dem kontexte gemäss entschieden werden, was zu katalysieren ist. (Falls das zu ergänzende äussere z-feld byl bych rád o.ä. sein kann, erhält der kdyby-satz scheinbar einen desiderativen sinn): Och, kdyby tu byla Helena

kěž by mohl žít znovu v tom zapomenutém barevném světě (cited by Bech 1951, 85)

Dobrušina (2016, 63f.): *zhelatel’nyye konstruktsii* ‘desiderative constructions’, subjunctive root clauses; ‘a rare semantic type of counterfactual wish’

7.3.2 Equatives with ‘if’ clauses

Bledin and Srinivas (2003)

Restrictive and nonrestrictive ‘as if’ equatives, reconstruction of a consequent

Restrictive case consequent: Some definite description, set description or function value description is equated with itself evaluated de re and de dicto: $\lambda w \dots w_0 \dots = \dots w$

No non-actuality entailment predicted, but note that the inference is not strong, and ‘arsenic cases’ or the similar case of a possible continuation ‘and maybe she did’ are probably not uncommon

as if he had had a stroke

as if she had seen something...

když se tak na mne podíval, jako bych četl jeho myšlenky (cited by Bech 1951, 84)

7.4 Implicature cancelation?

8 Conclusions

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Appendix A Section title of first appendix

An appendix contains supplementary information that is not an essential part of the text itself but which may be helpful in providing a more comprehensive understanding of the research problem or it is information that is too cumbersome to be included in the body of the paper.

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