

Chapter 21

How factive is the perfective? On the interaction between perfectivity and factivity in Polish

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This paper aims to provide evidence for a systematic correlation between the perfective aspect of the matrix verb and the factive interpretation of embedded object sentences in Polish. Embedding by perfective matrix verbs makes propositions systematically ‘more factive’ than embedding by their imperfective counterparts. The strength of the inference depends on the semantic class the verb belongs to. The perfective operator introduces a nearly undefined truthfulness feature, which is specified as factive, veridical or reliable depending on the relation between the truth of the proposition expressed by the embedded clause and the event described by the matrix verb.

Keywords: perfectivity, factivity, veridicality, presupposition, entailment, implicature

1 Introduction

There is no one simple way to define factivity, and especially the truth-related inferences in general. In this paper, I will adopt assumptions which can be used to describe perfectivity-dependent truthfulness in Polish. It should be pointed out that the whole spectrum of the literature available is much broader.

According to Kiparsky & Kiparsky (1970), a verb *V* that takes a that-clause *p* is called **FACTIVE** if asserting *Vp* presupposes the truth of the complement *p* (but see also Karttunen 1971 for a discussion of the presuppositional account). Following Egré (2008: 101), a verb *V* is called **VERIDICAL** if it entails the truth of

its complement when used in the positive declarative form, more precisely if it satisfies the scheme $Vp \rightarrow p$ for all p , where p is a that-clause.

I will refer to the first option as TRUTH PRESUPPOSITION (factivity in a common sense). It holds when the inference remains under negation or after the insertion of a modal adverbial (for a semantic definition of presupposition, see Strawson 1950). Truth presupposition concerns for instance perfective *przewidzieć*, as can be seen in the following examples. ‘ \gg ’ marks presupposition.¹

- (1) Ola nie / prawdopodobnie przewidziała, że Marek boi się
 Ola NEG probably predicted.PFV that Marek fears.IPFV REFL
 duchów.
 ghost.PL
 ‘Ola did not predict / probably predicted that Marek fears ghosts.’
 \gg Marek fears ghosts.
- (2) Ola nie / prawdopodobnie przewidywała, że Marek boi się
 Ola NEG probably predicted.IPFV that Marek fears.IPFV REFL
 duchów.
 ghost.PL
 ‘Ola was not predicting / was probably predicting that Marek fears
 ghosts.’
 \nrightarrow Marek fears ghosts.

Examples (1) and (2) consist of an aspectual minimal pair exhibiting complementary behavior of the feature $[\pm\text{perfective}]$ with respect to the enforcing of a factive interpretation of their complement sentences. Whereas the perfective variant presupposes the truth of its sentential argument, the imperfective one does not. After the insertion of a sentence negation or a modal adverbial, (1) implicates that Marek fears ghosts. Sentence (2) only says that Ola was guessing / tried to predict that Marek fears ghosts, but it leaves it open whether she was correct or not.

The second option will be called TRUTH ENTAILMENT. Truth entailment results in an occurrence of a veridical meaning of the proposition expressed by the subordinate clause. Here, the inference is present in affirmative sentences, but it does not project. We can find it for example in the perfective *potwierdzić*. I will use ‘ \rightarrow ’ to mark entailment.

¹All embedded verbs are marked for the imperfective aspect and used in the present tense in order to exclude the influence of perfectivity and past tense morphology within the subordinate clause on the truth inferences observed.

- (3) Komisarz potwierdził, że Marek boi się duchów.
 commissioner confirmed.PFV that Marek fears.IPFV REFL ghost.PL
 ‘The commissioner confirmed that Marek fears ghosts.’
 → Marek fears ghosts.
- (4) Komisarz potwierdzał, że Marek boi się duchów.
 commissioner confirmed.IPFV that Marek fears.IPFV REFL ghost.PL
 ‘The commissioner was confirming that Marek fears ghosts.’
 → Marek fears ghosts.

Truth entailment can be found in *potwierdzić* and is absent in *potwierdzać*; whereas it seems to follow from (3) that Marek fears ghosts, (4) states that this is a possible, but not an obligatory interpretation. The inference presented in (3) does not project, which excludes it from being a presupposition. Consider (5).

- (5) Komisarz nie / prawdopodobnie potwierdził, że Marek
 commissioner NEG probably confirmed.PFV that Marek
 boi się duchów.
 fears.IPFV REFL ghost.PL
 ‘The commissioner did not confirm / probably confirmed that Marek fears
 ghosts.’
 → Marek fears ghosts.

The third and weakest option is the TRUTH IMPLICATURE (see also Hacquard 2006 for the so-called actuality implicature, as illustrated in (9)). I will use this term to refer to an inference which cannot be captured by factivity or veridicality (it is clearly pragmatic, since it can be canceled). Here, the proposition embedded under a perfective communication verb is taken for granted due to the reliability of the sentence subject (cf. Schlenker 2010 for the factivity of announcements). The same proposition embedded under a particular imperfective counterpart is neutral with respect to the reliability condition. Consider examples (6a) and (6b). I will use ‘ \sim ’ to mark implicature.

- (6) a. Ela powiedziała, że jest w pracy.
 Ela said.PFV that is.IPFV at work
 ‘Ela said that she is at work.’
 \sim Ela is at work.
- b. Ela mówiła, że jest w pracy.
 Ela said.IPFV that is.IPFV at work
 ‘Ela was saying that she is at work.’
 \rightsquigarrow Ela is at work.

In the perfective variant (6a), the speaker takes the truth of what the sentence subject said for granted; Ela is considered reliable and she is expected to tell the truth. In the imperfective variant (6b), the speaker does not want to commit herself to the truth of the proposition. It is left open whether the speaker considers the sentence subject reliable. As a result, there is no implicature that Ela is at work. The reliability effect seems to correlate with fulfilling all the parts of the speech act (see §4.3), which is necessarily the case when using the perfective and which does not have to be the case when using the imperfective (see Cohen & Krifka 2014; Krifka 2015 for commitment space semantics).

We could refer to the abovementioned inferences as a TRUTHFULNESS SCALE. The strongest inference – truth presupposition – represents the highest value on that scale, while truth implicature stands for the lowest one. Between them there is the medium strength inference – truth entailment. A more detailed classification may be developed after more conclusive research has been done.

Perfectivity-dependent truthfulness needs to be distinguished from the truthfulness of inherently factive imperfectives, where the perfectivizing operation only results in the specification of a temporal boundary of an event, for instance: *żałować* ‘regret.IPFV’ vs. *pożałować* ‘start regretting.PFV’ (cf. Egré 2008 for an interesting discussion about *regret*, though), unless the meaning of the derivate becomes non-compositional (*wiedzieć* ‘know.IPFV’ + factive vs. *powiedzieć* ‘say.PFV’ + non-factive). In contrast, all truth inferences which originate from the perfective do not occur in the case of the respective imperfective counterparts.

At this point, I would like to make an important remark concerning the tense of the matrix verb. I use the past tense in all examples, because it is available for any verbal stem regardless of the aspectual marking. The present tense morphology results in future reference in the case of the perfective, whereas both present tense and the periphrastic future construction are available for the imperfective. Because the analyzed sentences are supposed to be minimal pairs (differing only in the aspectual marking on the matrix verb), using the past tense was the only option.

In this paper, I will examine different verbs falling into class 1 (truth presupposition), class 2 (truth entailment) and class 3 (truth implicature). I provide an account of perfectivity-dependent truth inferences in Polish, which will be presented in §5. Before coming to that, I will briefly discuss the influence of aspect on the interpretation of nominal arguments, which serves as a starting point for an investigation of the correlation between the perfectivity of the matrix verb and the interpretation of complement sentences.

2 Aspect and the interpretation of nominal arguments

It has been pointed out by Wierzbicka (1967) that in perfective sentences in Polish the direct object is interpreted as definite, while in imperfective ones it is understood as indefinite. Consider example (7).

- (7) On *zjadł* / *jadł* orzechy.
 he ate.PFV ate.IPFV nut.PL
 'He ate all of the nuts / was eating (some) nuts.'

In the case of *zjadł*, the reference is to a definite group of entities – the nuts. The object is completely affected by the verbal process (as a result, there are no more nuts left). In contrast, neither the definite nor the totality reading is enforced when using *jadł*. Here, the partitive interpretation is available amongst others, corresponding to 'some of the nuts'.

However, Filip (2005: 128) shows that perfective aspect does not always require that bare nominal arguments in its scope refer to one whole and specific individual (consider for instance the perfective Czech and Polish equivalents of the English verb *bring*). That means that not only aspect, but also verb semantics and especially the thematic relation between the nominal object and the verb determine the referential properties of the entire predicate.

The crucial point is that the perfective operator can take scope over both the matrix verb and its nominal complement. A formal analysis of this correlation has been developed by Krifka (1989a,b; 1992; 1998). Different theoretical implementations are possible; because it is not the main focus of this paper, I will not discuss them in greater detail.

According to Krifka, complex verbal expressions (verb plus direct object) have either a cumulative or a quantized reference. We can define them in terms of the sum operation: $x \sqcup y$ 'the sum of x and y '. For example, the sum of two events of 'eating grapes' still yields an event of 'eating grapes'. The predicate 'eating grapes' has a cumulative reference – we can apply it not only to the single events, but also to the sum of them. In contrast, the joining of two events of 'eating two grapes' can no longer be described with 'eating two grapes', because 'eating two grapes' plus 'eating two grapes' does not equal 'eating two grapes'. The predicate 'eating two grapes' has a quantized reference – we can apply it to the single events, but not to the sum of them. Apart from the sum operation, the proper part relation can be defined: $x \sqsubset y \leftrightarrow x \sqsubseteq y$ and $x \neq y$. For example, there is no proper part of an event 'eating two grapes' which is an event of 'eating two grapes'. This illustrates another property of the quantized reference.

Krifka assumes that the perfective operator presupposes the quantization of the entire predicate, whereas the imperfective operator requires its cumulativity. This correlation primarily (but not exclusively, cf. Krifka 1998) holds for predicates which allow mapping of objects to events and vice versa (the so-called homomorphism of objects to events). Certainly, it cannot be considered a 1:1 relationship (cf. Filip 1996; 2005 or Borik 2006). In Polish, the verbal predicate marked with the perfective aspect is quantized iff the whole verbal complex receives a telic interpretation, particularly in the case of predicates with nominal objects that are incremental themes. On the other hand, we get the combination of features [+perfective] and [–telic] after adding the delimitative prefix *po-* to the imperfective stem; in these cases the predicate is to be interpreted as atelic despite the perfective marking on the verb. Thus, the following generalization holds for Polish: telicity implies quantization, but perfectivity does not imply telicity (see also Gehrke 2008). As will become clear later, the truth inference of a sentential complement is triggered by perfectivity.

3 Cross-linguistic evidence for the interaction between perfectivity and factivity

The influence of the perfective aspect of a matrix verb on the factive interpretation of complement clauses has already been observed. Hacquard (2006) shows that both actuality entailment and actuality implicature can be found in some modal constructions in French, when a modal is marked with the perfective.

Actuality entailment refers to the uncancelable inference stating that the proposition expressed by the complement clause holds in the actual world.² Consider (8), adapted from Hacquard (2006: 21).

- (8) Jane #a pu / pouvait soulever cette table, mais elle ne
 Jane AUX could.PFV could.IPFV lift this table but she NEG
 l'a pas soulevée.
 it.AUX NEG lift
 'Jane could lift this table, but she did not lift it.'

Example (9) demonstrates an actuality implicature (adapted from *ibid.* 16).

²Bhatt (1999) observed the correlation between perfectivity marked on ability modals and the presence of the actuality entailment in Greek and Hindi.

- (9) Darcy a eu / avait la possibilité de rencontrer Lizzie.
 Darcy AUX had.PFV had.IPFV the possibility to meet Lizzie
 ‘Darcy had the possibility to meet Lizzie.’

When used with the perfective, (9) strongly suggests (but does not entail) that Darcy did meet Lizzie.

The correlation between perfectivity and factivity can also be seen in Hungarian; it concerns the influence of embedding verbs of saying on the interpretation of their sentential complements. Whereas *megmond* ‘say.PFV’ requires the argument to be true, *mond* ‘say.IPFV’ does not (see Kiefer 1986). Even though aspect is not grammaticalized in Hungarian (it is not obligatory for every verb to have its (im)perfective twin), informal investigations among speakers show that we can observe clear aspect-dependent differences with respect to the truthfulness of propositions embedded under verbs marked as perfective.

In the next section I am going to present Polish data showing a systematic interaction between perfectivity and truthfulness. In Polish, the category of aspect is fully grammaticalized, which allows us to take a closer look at the abovementioned dependency.

4 Aspect-dependent truth inferences in Polish

4.1 Case 1: Truth presupposition

One group of verbs where the truth presupposition of the perfective can be found is verbs of guessing.³ From (10) it follows that the proposition from the embedded clause – Marek fears ghosts – is true. Example (11) demonstrates that this inference projects, i.e. it remains under negation and after the insertion of a modal adverbial.

- (10) Jan zgadł / wyczuł, że Marek boi się duchów.
 Jan guessed.PFV sensed.PFV that Marek fears.IPFV REFL ghost.PL
 ‘Jan guessed that Marek fears ghosts.’
 >> Marek fears ghosts.

³The strength of the inference may also depend on *aktionsart*. For example, a resultative verb *wyczuć* ‘sense.PFV’ is factive, whereas the inchoative *poczuć* ‘start feeling.PFV’ is not (a similar observation holds for Czech, Radek Šimík, p.c.). It seems that inchoativity does not give rise to factivity, but to a weak truth implicature.

- (11) Jan nie / prawdopodobnie zgadł / wyczuł, że Marek
 Jan NEG probably guessed.PFV sensed.PFV that Marek
 boi się duchów.
 fears.IPFV REFL ghost.PL
 ‘Jan did not guess / probably guessed that Marek fears ghosts.’
 ⇒ Marek fears ghosts.

Contrary to this, no such inference appears with the particular imperfective counterparts. Example (12) shows that there is no entailment, let alone presupposition, that Marek fears ghosts when the subordinate clause is embedded under the imperfective variants of ‘guess’ / ‘sense’.

- (12) Jan zgadywał / wyczuwał, że Marek boi się duchów.
 Jan guessed.IPFV sensed.IPFV that Marek fears.IPFV REFL ghost.PL
 ‘Jan supposed that Marek fears ghosts.’
 → Marek fears ghosts.

As expected, the truth inference is also absent under negation and after the insertion of a modal adverbial. Consider (13).

- (13) Jan nie / prawdopodobnie zgadywał / wyczuwał, że Marek
 Jan NEG probably guessed.IPFV sensed.IPFV that Marek
 boi się duchów.
 fears.IPFV REFL ghost.PL
 ‘Jan did not suppose / probably supposed that Marek fears ghosts.’
 → Marek fears ghosts.

Examples (12) and (13) leave it open whether it is true that Marek fears ghosts. Other members of this class are: *odkryć, odkrywać* ‘discover’, *rozgryźć, rozgryzać* ‘figure out’, and *rozpoznać, rozpoznawać* ‘identify’.

4.2 Case 2: Truth entailment

Many perfective matrix verbs show an implicative behavior with respect to the truth inference of the proposition from the subordinate clause. For instance, verbs of proving seem to entail that their sentential argument is true, which can be seen in (14). *Udowodnić* and *wykazać* are much stronger in their veridicality than *pokazać* however.

- (14) Jan udowodnił / wykazał / pokazał, że Marek boi się
 Jan proved.PFV revealed.PFV showed.PFV that Marek fears.IPFV REFL
 duchów.
 ghost.PL
 ‘Jan proved / revealed / showed that Marek fears ghosts.’
 → Marek fears ghosts.

Interestingly, this inference is apparently cancelable in particular contexts. Consider (15) (cf. Anand & Hacquard 2014: 74).

- (15) Jan udowodnił Basii, że Marek boi się duchów, jednak
 Jan proved.PFV Basia.DAT that Marek fears.IPFV REFL ghost.PL but
 Krzysiek w to wątpi.
 Krzysiek in this doubts
 ‘Jan proved to Basia that Marek fears ghosts, but Krzysiek doubts that.’
 → Marek fears ghosts.

All the predicates in (14) allow an overt experiencer, which makes veridicality questionable. (15) says that Jan succeeded in convincing Basia that Marek fears ghosts, but he did not manage to convince Krzysiek. As a result, the lexical entry of the matrix predicate corresponds more to *convince* than to *prove*.

The ‘weak entailment’ from (14) does not project under negation or after the insertion of a modal adverbial, which can be seen in (16).

- (16) Jan nie / prawdopodobnie udowodnił / wykazał / pokazał, że
 Jan NEG probably proved.PFV revealed.PFV showed.PFV that
 Marek boi się duchów.
 Marek fears.IPFV REFL ghost.PL
 ‘Jan did not prove / reveal / show / probably proved / revealed / showed
 that Marek fears ghosts.’
 → Marek fears ghosts.

Example (16) only says that Jan did not succeed / that Jan probably succeeded in providing arguments for Marek’s fear of ghosts, but it leaves it open whether the complement sentence is true or not.

We have just seen that the weak truth entailment in the case of perfective verbs of proving can disappear in particular contexts, especially after an overt realization of an experiencer. Furthermore, the significance or trustworthiness of the authority also plays a role in acknowledging a complement proposition as

veridical. No projection pattern can be observed, which means that we are not dealing with a presupposition here.

Particular imperfective forms lack any kind of truth-contributing potential. Consider example (17) for affirmative sentences.

- (17) Jan udowadniał / wykazywał / pokazywał, że Marek boi się
Jan proved.IPFV revealed.IPFV showed.IPFV that Marek fears.IPFV REFL
duchów.
ghost.PL
'Jan was proving / revealing / showing that Marek fears ghosts.'
→ Marek fears ghosts.

Example (17) asserts that Jan was trying to prove / reveal / show that Marek fears ghosts, but it does not make any statement about the final results of Jan's investigations. As expected, no truth inference can be found under negation or after the addition of a modal adverbial, which can be seen in (18).

- (18) Jan nie / prawdopodobnie udowadniał / wykazywał / pokazywał,
Jan NEG probably proved.IPFV revealed.IPFV showed.IPFV
że Marek boi się duchów.
that Marek fears.IPFV REFL ghost.PL
'Jan was not / probably proving / revealing / showing that Marek fears
ghosts.'
→ Marek fears ghosts.

Example (18) demonstrates possible modifications of the likelihood of Jan having tried to prove / reveal / show that Marek fears ghosts. No contribution to the truth-related meaning of the complement sentence can be observed. Another member of this group is for instance *przekonać, przekonywać* 'convince'.

4.3 Case 3: Truth implicature

Truth implicature refers especially to the perfective communication verbs, which differ from their imperfective counterparts in that the former, but not the latter, entail the complete realization of all parts of the speech act. Austin (1962) defines a speech act as consisting of three partial acts. The first one, a locutionary act, is the act of uttering itself. The second one, an illocutionary act, affects the area of the speaker's intention. Finally, a perlocutionary act describes an actual effect the particular speech act had on the hearer. A speech act is presumed to

be completely realized only if all three parts have been fulfilled. In Polish, perfective communication verbs, in contrast to imperfective ones, enforce complete fulfillment of all parts of the speech act, as example (19) illustrates.⁴

- (19) Iza właśnie go o tym #poinformowała / informowała, ale
 Iza just him about that informed.PFV informed.IPFV but
 przerwał jej w pół słowa.
 interrupted her in middle word
 'Iza has just informed / was just informing him about that, but he
 interrupted her in the middle of the sentence.'

Only *poinformowała* entails that the hearer received the information.

5 Perfectivity-dependent truthfulness

First of all, a short note on telicity should be made. My object of investigation is embedding predicates, which are transitive verbs. They all require a direct object, realized as a sentential complement; for the purpose of my analysis, I consider that-clause a definite argument. For this reason, the whole complex predicate receives a telic interpretation, independently of the (im)perfective marking on the verb. The truth inference is present when the matrix predicate has the features [+telic, +perfective], and it is absent when the matrix predicate has the features [+telic, -perfective].

Based on the influence of aspect on the interpretation of nominal arguments, I also assume a dependency between aspect and a propositional argument. The aspectual operator PFV introduces a further undefined truthfulness feature, which is specified as factive, veridical or reliable via the dependency between the truth of *p* (where *p* stands for the proposition expressed by the that-clause) and an event *e* described by the matrix verb. For now, the three truthfulness-realizations can be formalized as follows:⁵

⁴I would like to thank Manfred Krifka for inspiring this idea.

⁵The operations are based on the semantics of the perfective and not on the formation patterns. In future work, the morphology will be integrated into the semantic account (cf. Młynarczyk 2004).

- (20) For a VP with a propositional complement p
- a. $\text{PFV}(\lambda e. \llbracket \text{VP} \rrbracket(e))$ such that the truth of p is independent of e
 $\rightarrow p$ is factive
 - b. $\text{PFV}(\lambda e. \llbracket \text{VP} \rrbracket(e))$ such that the truth of p is dependent on e
 $\rightarrow p$ is veridical
 - c. $\text{PFV}(\lambda e. \llbracket \text{VP} \rrbracket(e))$ such that the truth of p is communicated by e
 $\rightarrow p$ is reliable

Truth presupposition comes about when the truth of p is independent of the truth of e . Here, no incremental creation of belief can be observed. For example, the truth of propositions embedded under *zgadnąć* or *przewidzieć* holds independently of the process of guessing or predicting. In contrast, the truth of propositions embedded under *udowodnić*, *wykazać* or *pokazać* does depend on the result of the proving-process; we have an incremental creation of belief. This explains why the authority of an experiencer or its overt realization are crucial for judging complement sentences as veridical. In the case of truth implicature, the truth of p is ‘only’ communicated by e .

The question remains whether ‘being reliable’ should be considered a feature at all, or if it should be labeled as ‘no feature present’. In the latter case, truthfulness set up by the perfective operator would remain unrealized if the inference was an implicature. Another open question concerns the role of morphology in determining the strength of the inference. It seems that perfective underlying forms tend to enforce factive meaning of the proposition expressed by the subordinate clause. Additionally, verb semantics and argument structure may also be taken into consideration, since specifying an experiencer can influence the entailment pattern. In general, the semantic type of the matrix verb could be used to distinguish between different verb classes and to establish a more fine-grained truthfulness scale. All this will be the subject of further investigations.

In the last section of this paper I will briefly discuss the inherently factive imperfectives and their perfective counterparts. It will be shown that they constitute a unique group with factivity being an aspect-independent, lexical property of the root form, which automatically projects to the perfective derivate.

6 Remark on inherently factive imperfectives

As has been mentioned before, inherently factive imperfectives (for example emotive factives) require their complements to be true. Consider example (21).

- (21) Ania cieszyła / ucieszyła się, że idzie lato.
 Ania was.happy.IPFV was.happy.PFV REFL that comes.IPFV summer
 ‘Ania was happy / started being happy about the fact that the summer
 was coming.’
 >> The summer was coming.

The only difference between *cieszyła* and *ucieszyła* lies in the marking of the beginning of a state in the case of the latter. The underlying imperfective form is inherently factive (lexical factivity), so it remains factive when perfectivized. In the case of inherently factive imperfectives the perfectivizing operation leads to the marking of a temporal boundary of an event, but it does not enforce or change the truth inference of the proposition from the embedded clause (see also §1). This pattern needs to be distinguished from the ones discussed in §4 and §5, where the truth inference ascribed to the perfective was absent in the particular imperfective forms. Other inherently factive imperfectives are *rozumieć* ‘understand’ and *kapować* ‘get’.

7 Conclusion

In this paper, I demonstrated three kinds of perfectivity-dependent truth inferences in Polish: truth presupposition, truth entailment and truth implicature. In the case of truth presupposition, the proposition from the embedded clause receives a factive interpretation. The inference remains under negation or after the insertion of a modal adverbial. In the case of truth entailment, a veridical interpretation of the complement sentence can be observed; only the positive sentence is interpreted as true. In the case of truth implicature, the inference in question is neither factivity nor veridicality. It is due to a pragmatic principle giving preference to the perfective verb if the speaker assumes that the sentence subject is reliable (speaker commitment to the truth of *p*).

Despite the differences in the strength of particular inferences, the truthfulness of the proposition from the embedded clause is only due to perfectivity – it is absent with imperfective forms. Embedding by imperfective matrix verbs results in the occurrence of a neutral interpretation of a that-clause with respect to its truthfulness, provided that the embedding imperfective verb is not inherently factive. The aspectual operator PFV introduces a truthfulness feature, which is realized as factive, veridical or reliable depending on the relation between the truth of the proposition expressed by the embedded clause and an event described by the matrix verb.

The question remains as to how truthfulness interacts with perfectivity itself. In the case of communication verbs, the completedness condition of the perfective enforces the complete performance of the speech act denoted by the matrix verb. The speaker of the sentence chooses the perfective if she considers the speaker of the speech act reliable. As a result, the proposition expressed by the *that*-clause is understood to be true. In the case of verbs of proving, the completedness effect of the perfective interacts with the incrementality, which is a part of lexical verb semantics. A proof is a proof after its final step is completed. For verbs of guessing, the truth presupposition is triggered in combination with the integration of the proposition ‘someone guessed something’ into the common ground. The speaker uses the perfective in order to demonstrate that the guessing event has been completely realized. The cooperative hearer accepts the proposition as true, which triggers the presupposition rooted in the lexical verb semantics.⁶

In future work, a detailed study with different semantic groups of verbs will be conducted. In addition the type of embedding is to be controlled for, since it may be involved in determining the strength of the inference available. An interesting observation concerns perfective verbs of saying which embed *wh*-phrases; they seem to function as exhaustivity triggers. Thus, exhaustivity could also be used to make the truthfulness scale more fine-grained.

Abbreviations

DAT	dative	PL	plural
(I)PFV	(im)perfective	REFL	reflexive
NEG	negation		

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References

- Anand, Pranav & Valentine Hacquard. 2014. Factivity, belief and discourse. In Luka Crnić & Uli Sauerland (eds.), *The art and craft of semantics: A festschrift for Irene Heim*, vol. 1, 69–90. Cambridge: MIT Working Papers in Linguistics.
- Austin, John. 1962. *How to do things with words*. Oxford: Clarendon Press.
- Bhatt, Rajesh. 1999. *Covert modality in non-finite contexts*. University of Pennsylvania PhD thesis. <https://repository.upenn.edu/dissertations/AAI9937701>.
- Borik, Olga. 2006. *Aspect and reference time*. Oxford: Oxford University Press. DOI:10.1093/acprof:oso/9780199291298.001.0001
- Cohen, Ariel & Manfred Krifka. 2014. Superlative quantifiers and meta-speech acts. *Linguistics and Philosophy* 37(1). 41–90. DOI:10.1007/s10988-014-9144-x
- Egré, Paul. 2008. Question-embedding and factivity. *Grazer Philosophische Studien* 77(1). 85–125.
- Filip, Hana. 1996. Integrating telicity, aspect, and NP semantics: The role of thematic structure. In Jindřich Toman (ed.), *Formal Approaches to Slavic Linguistics 3: The College Park Meeting 1994*, 61–96. Ann Arbor, MI: Michigan Slavic Publications.
- Filip, Hana. 2005. On accumulating and having it all: Perfectivity, prefixes and bare arguments. In Henk Verkuyl, Henriëtte de Swart & Angeliek van Hout (eds.), *Perspectives on aspect*, 125–148. Dordrecht: Springer. DOI:10.1007/1-4020-3232-3_7
- Gehrke, Berit. 2008. *Ps in motion: On the semantics and syntax of P elements and motion events*. Utrecht: LOT. <https://www.lotpublications.nl/ps-in-motion-ps-in-motion-on-the-semantics-and-syntax-of-p-elements-and-motion-events>.
- Hacquard, Valentine. 2006. *Aspects of modality*. Cambridge, MA: MIT PhD thesis. <https://dspace.mit.edu/handle/1721.1/37421>.
- Karttunen, Lauri. 1971. Some observations on factivity. *Papers in Linguistics* 4(1). 55–69. DOI:10.1080/08351817109370248
- Kiefer, Ferenc. 1986. Some semantic aspects of indirect speech in Hungarian. In Florian Coulmas (ed.), *Direct and indirect speech*, 201–217. Berlin: Mouton. DOI:10.1515/9783110871968.201
- Kiparsky, Paul & Carol Kiparsky. 1970. Fact. In Manfred Bierwisch & Karl Erich Heidolph (eds.), *Progress in linguistics*, 143–173. The Hague: Mouton.
- Krifka, Manfred. 1989a. *Nominalreferenz und Zeitkonstitution: Zur Semantik von Massentermen, Pluraltermen und Aspektklassen*. München: Wilhelm Fink Verlag.

- Krifka, Manfred. 1989b. Nominalreferenz, Zeitkonstitution, Aspekt, Aktionsart: Eine semantische Erklärung ihrer Interaktion. In Werner Abraham & Theo Janssen (eds.), *Tempus – Aspekt – Modus: Die lexikalischen und grammatischen Formen in den germanischen Sprachen*, 227–258. Tübingen: Niemeyer.
- Krifka, Manfred. 1992. Thematic relations as links between nominal reference and temporal constitution. In Ivan Sag & Anna Szabolcsi (eds.), *Lexical matters*, 29–53. Stanford: CSLI Publications.
- Krifka, Manfred. 1998. The origins of telicity. In Susan Rothstein (ed.), *Events and grammar*, 197–235. Dordrecht: Kluwer. DOI:10.1007/978-94-011-3969-4_9
- Krifka, Manfred. 2015. Bias in commitment space semantics: Declarative questions, negated questions, and question tags. In Sarah D’Antonio, Mary Moroney & Carol Rose Little (eds.), *Semantics and Linguistic Theory* 25, 328–345. Washington, D.C.: LSA Open Journal Systems. DOI:10.3765/salt.v25i0.3078
- Młynarczyk, Anna. 2004. *Aspectual pairing in Polish*. Utrecht: LOT. <https://www.lotpublications.nl/aspectual-pairing-in-polish-aspectual-pairing-in-polish>.
- Schlenker, Philippe. 2010. Local contexts and local meanings. *Philosophical Studies* 151(1). 115–142. DOI:10.1007/s11098-010-9586-0
- Strawson, Peter. 1950. On referring. *Mind* 59(235). 320–344. <http://www.jstor.org/stable/2251176>.
- Wierzbicka, Anna. 1967. On the semantics of verbal aspect in Polish. In *To honor Roman Jakobson*, 2231–2249. The Hague: Mouton.