On the veridicality of perfective clause-embedding verbs in Polish:

A unified aspect-based analysis of incremental theme verbs with nominal and propositional complements

Dissertation

zur Erlangung des akademischen Grades

Doktorin der Philosophie (Dr. phil.)

eingereicht an der Sprach- und literaturwissenschaftlichen Fakultät der Humboldt-Universität zu Berlin

von

M.A. Karolina Zuchewicz

Prof. Dr.-Ing. Dr. Sabine Kunst

Präsidentin der Humboldt-Universität zu Berlin

Prof. Dr. Ulrike Vedder

Dekanin der Sprach- und literaturwissenschaftlichen Fakultät

GutachterInnen:

1. Prof. Dr. Luka Szucsich

2. Prof. Dr. Manfred Krifka

3. Prof. Dr. Hana Filip

Tag der Verteidigung: 11.06.2020

Danksagung

Ich möchte mich in erster Linie bei Luka Szuscich und Manfred Krifka bedanken, die die besten Betreuer sind, die ich mir je hätte wünschen können. Dank unserer vorbildlichen Zusammenarbeit, unzähliger Gespräche und enormer Unterstützung, die ich während der gesamten Vorbereitungs- und Schreibphase bekommen habe, konnte ich diese Dissertation in der vorliegenden Form einreichen. Auch möchte ich mich bei Hana Filip bedanken, die das dritte Gutachten angefertigt und mich bei mehreren Gelegenheiten fachlich unterstützt hat.

Ich danke meinen KollegInnen vom Fachbereich III: Syntax und Lexikon vom Leibniz-ZAS: Werner Frey, Jens Hopperdietzel, Sybille Kiziltan, Thomas McFadden, André Meinunger, Fereshteh Modarresi, Zorica Puškar-Gallien, Frank Seifart, Torgrim Solstadt, Kasia Stoltmann und Tonjes Veenstra. Ich danke Anton Benz, Joanna Błaszczak, Ola Ćwiek, Nicole Gotzner, Ana Krajinović, Clemens Mayr, Roland Meyer, Oksana Rasskazova, Fabienne Salfner, Uli Sauerland, Dària Serés, Marcin Wągiel, Kata Wohlmuth and Tue Trinh. Auch möchte ich mich bei dem Publikum von SuB24 und SSPAM (TbiLLC 2019) bedanken, insbesondere bei Markus Egg, Daniel Hole und Malte Zimmermann. Ein ganz besonderer Dank geht an Artemis Alexiadou, Berit Gehrke, Dara Jokilehto, Paul Marty, Kerstin Schwabe, Radek Šimík, Carla Umbach und Kilu von Prince, die mir einen starken inhaltlichen Input gegeben haben. Felix Golcher danke ich für seine Hilfe bei der statistischen Auswertung. Für die Korrektur des Englischen möchte ich mich bei Una MacLean bedanken.

Zuletzt möchte ich meinen Eltern Joanna und Tadeusz Zuchewicz sowie meiner Schwester Maja danken. Ohne deren Liebe und Glauben an mich wäre ich an diesem Punkt nie angekommen.

Abstract

In my dissertation, I investigated a systematic interaction between the perfective aspect of a clause-embedding verb and a truth-oriented interpretation of embedded propositions in Polish. I demonstrated that the so-called reveal-type predicates ('prove', 'reveal', 'show [that]') are in complementary distribution with respect to triggering truth-related meaning of their sentential complements. Whereas perfective variants enforce embedded propositions to be true, imperfective counterparts are almost only compatible with false (or neutral) propositions. I further showed that clause-embedding reveal-type predicates exhibit an incremental structure and can therefore be treated by analogy to verbs that combine with nominal incremental themes. In the former case, we have a gradual creation of a proof, whereas in the latter case, we have a gradual creation of an object like 'wardrobe' (maximality of evidence = maximality of a wardrobe). I proposed a novel analysis of incremental theme verbs that combine with either nouns or clauses. According to my analysis, one possible realization of a partial-total affectedness of an incremental theme is a gradual creation of a proof for an embedded proposition. In order to obtain empirical evidence for the (non-)veridicality of (im)perfective reveal-type predicates in Polish, I conducted an acceptability judgement study with 51 Polish native speakers. I further conducted a corpus-based analysis of the frequency of investigated lexemes, which completed the interpretation of results. Apart from Polish, I provided evidence from other Slavic languages (Czech, Russian) and some non-Slavic languages (Austronesian languages, French, Hungarian).

Zusammenfassung

Die vorliegende Arbeit beschäftigt sich mit der wahrheitsbasierten Bedeutung perfektiver satzeinbettender Prädikate im Polnischen, i.e. mit dem Zusammenhang zwischen Aspekt und Wahrheitsinferenz. Den Kern meiner Dissertation bilden sogenannte ‚reveal-type predicates' wie 'beweisen', 'zeigen' oder 'offenbaren [dass]'. In Abhängigkeit von deren aspektueller Markierung bringen sie entweder eine maximale (bei perfektiven Verben) oder eine partielle Evidenz (bei imperfektiven Verben) für die Wahrheit einer eingebetteten Proposition mit sich. Nur wenn die Evidenz maximal ist, wird der dass-Satz notwendigerweise als wahr interpretiert. Ich habe gezeigt, dass maximale Evidenz einer totalen Affiziertheit eines nominalen inkrementellen Themas (wie z. B. in 'einen Schrank bauen.PFV') entspricht (Maximalität von Evidenz = Maximalität vom Schrank). Somit sind reveal-type predicates inkrementell. Außerdem habe ich eine Akzeptabilitätsstudie mit 51 polnischen MuttersprachlerInnen geplant und durchgeführt, die die Veridikalität des Perfektivs und die Neutralität des Imperfektivs bestätigt hat. Die Interpretation der Ergebnisse wurde um eine Korpusuntersuchung ergänzt. Basierend auf den theoretischen Beobachtungen und den Studienergebnissen habe ich eine einheitliche Analyse für inkrementelle Verben vorgeschlagen, die entweder ein nominales oder ein propositionales Objekt verlangen. Die von mir für das Polnische entdeckten Korrelationen gelten auch für andere slawische (Tschechisch, Russisch) und einige nicht-slawische Sprachen (austronesische Sprachen, Französisch, Ungarisch).

Contents

1   Introduction

This dissertation aims to provide empirical evidence for and theoretic implementation of a systematic interaction between the perfective aspect of a matrix verb and a truth-oriented (factive or veridical) interpretation of embedded object sentences in Polish. It can be shown that a that-sentence tends to be interpreted as true if it is embedded under a perfective matrix verb, but not if it is embedded under a respective imperfective counterpart. The lexical-semantic properties of matrix verbs determine the exact parametrization of the truthfulness feature.

There are at least three different types of perfectivity-dependent truthfulness in Polish: truth-presupposition (factivity), truth-entailment (veridicality) and truth-implicature (based on Zuchewicz 2018). Truth-entailment is the most prominent and stable type of inference; in the acceptability judgement study, it showed the clearest contrast between the (im)perfective forms with respect to the interpretation of a complement sentence. Furthermore, it systematically applies to a uniform class of verbs. Its occurrence results from incrementality on a propositional level. Assuming incrementality for clause-embedding predicates justifies a uniform analysis for incremental theme verbs regardless of the type of complement they combine with. It further suggests a relationship between definiteness / quantization and veridicality.

2 Truth-presupposition, truth-entailment and truth-implicature

In this dissertation, I distinguish between the three above-mentioned types of truth-inference. In this section, I will explain the meaning of each term. First of all, **truth-inference** and **truthfulness** stand for any nearly undefined kind of inference that is related to truth. More precisely, truthfulness is a neutral term that can be specified by presupposition, entailment or implicature. I will start with presupposition.

2.1 Truth-presupposition

2.1.1 Semantic definition of presupposition adopted in this dissertation

According to Kiparsky & Kiparsky (1970), truth-presupposition is a defining criterion for factivity; we should call a verb *V* that combines with a that-clause *p* factive iff asserting *Vp* presupposes the truth of the complement *p* (cf. also Egré 2008: 101). For instance, all single assertions in (1) **have the presupposition** in (2), because (2) seems to follow not only from the respective affirmative sentences in (1), but also from their negation in (3), the question constructions in (4) and constructions modified by modal adverbials in (5); cf. for instance Chierchia & McConnell-Ginet (2000) for the diagnostics. These inference patterns constitute the basis for the semantic definition of presupposition.

(1)   Marc forgets / regrets / finds out / discovers that Kate needs a new car.

(2)   Kate needs a new car.

(3)   Marc does not forget / regret / find out / discover that Kate needs a new car.

(4)   Does Marc forget / regret / find out / discover that Kate needs a new car?

(5)   Marc probably / almost certainly forgets / regrets / finds out / discovers that Kate needs a new car.

In (1), presupposition is triggered by factive verbs *forget, regret, find out* and *discover*. According to Levinson (1983), other presupposition triggers include, among others, definite descriptions (Strawson 1950), implicative verbs like *manage* (Karttunen 1971a), change of state verbs (Karttunen 1973), temporal clauses (Frege 1948) or questions (Katz 1972). However, Karttunen (2016) observes that each of the above-mentioned items might represent a different (sub)phenomenon or at least be dividable into different sub-phenomena. He points out that treating them alike has led to the creation of incomplete or even incorrect definitions of presupposition (in the sense that the term has been used to refer to distinct phenomena).

Importantly, the aim of this dissertation lies neither in reformulating the notion of presupposition, nor in establishing its most accurate definition. The question arises as to

how the truth-inferences observed in Polish can be labeled. In other words, which terms should be used in order to most appropriately describe these inferences? Since existing definitions are applicable to the phenomena in question, there is no need to create new notions. Naturally, I will specify how I use each term.

The projection pattern illustrated in the above examples is the basis for the so-called **semantic definition of presupposition** (or the Strawsonian presupposition: Frege 1948, Strawson 1950, Beaver & Geurts 2014). To sum up, according to this definition, sentence *A* presupposes sentence *B* iff, whenever *A* is true, *B* is true, and, whenever the negation of *A* is true, *B* is true (for the presupposition projection see Morgan 1969, Langendoen & Savin 1971, Chierchia & McConnell-Ginet 2000).

However, Karttunen (1971b: 56) pointed out that the restriction of the notion of presupposition to presupposition triggers and the exclusive consideration of projection patterns provide a simplified picture of a broad class of many related, but not identical phenomena. In particular, the mood of the main sentence and the internal structure of the complement may affect the meaning of the entire clause and the accessibility or 'strength' of truth-inferences. Compare (6) and its logical form given in (7), both taken from Karttunen (1971b: 56).

(6)   Some senators regret that they voted for the SST.

(7)   For some senators $\underline{x}$, $\underline{x}$ regrets that $\underline{x}$ voted for the SST.

In (6), in contrast to (1), the complement of *regret* cannot be treated as a proposition. The phrase '$\underline{x}$ voted for the SST', which realizes the object argument, contains a variable that is bound by a quantifier that occupies a position outside the subordinate clause. Crucially, the phrase '$\underline{x}$ voted for the SST' receives its propositional status only after being brought into relation with a quantifier; otherwise it can be neither true nor false. For that reason, a strict division of (6) into presupposition and assertion as proposed in (8) does not make much sense; we cannot assume that (6) presupposes the truth of the embedded sentence (cf. Karttunen 1971b: 56).

(8)   ASSERTION: Some senators regret that they voted for the SST.
       PRESUPPOSITION: ?They voted for the SST.

Karttunen proposes the creation of pairs of axioms (in line with Carnap 1947) that specify semantic properties of predicates consisting of factive verbs. Consider example (9), adapted from Karttunen (1971b: 58).

(9) $(\forall x)(\forall s)[\text{regret}(x,s) \rightarrow s]$
       $(\forall x)(\forall s)[\neg \text{regret}(x,s) \rightarrow s]$

In (9), *x* ranges over persons (entities), and *s* over sentences or affirmations (for instance over '*x* voted for the SST'). "→" defines the semantic relation of implication or **entailment** (with the latter term being adopted in this dissertation); $p \rightarrow q$ holds iff, whenever *p* is true, *q* is true (in accordance with **implication** as defined in Austin 1962 or with **necessity** as defined in van Fraassen 1968). Under the above assumptions, one can take any utterance/statement that parametrizes variable *s* (like '*x* voted for the SST') and realizes variable *x* by an individual constant *a*. Then, in any case where '*a* regrets that *a* voted for the SST' holds, it also holds that *a* voted for the SST (Karttunen 1971b: 59).

However, consider (10) and its logical form (11), taken from Karttunen (1971b: 59).

(10)   Any senator who regrets that he voted for the SST is a fool.

(11)   Any senator, if he regrets that he voted for the SST, is a fool.

Obviously, (11) does not assert that there are any senators that regret that *p*. More specifically, the sentence does not contain any information about holding or non-holding of the regret-relation that is required for the derivation of the truth-presupposition (cf. (9)). Therefore, the semantic representation of *regret* proposed in (9) would predict that (10) does not presuppose anything that relates to a complement clause. However, (10) strongly suggests speaker's commitment to the assumption that there are senators who voted for the SST (it can, however, still be the case that no one regrets it).

Based on these observations, Karttunen proposes an enrichment of (9). Conditional constructions do not assert the truthfulness of their antecedents, but rather "**conversationally imply**" the existence of a logical possibility for them to be true for some individuals. As a consequence, (11) contains the following conversational implication (Karttunen 1971b: 60):

(12)   For some senators *x*, it is possible that *x* regrets that *x* voted for the SST.

Due to the observation that if it can be the case that there are senators who regret that they have voted for the SST, it must be the case that they have actually voted for it. For that reason, Karttunen (1971b: 60) proposes the insertion of the possibility operator M (= 'it is possible that') into the semantic representation of factive verbs.

(13) $(\forall x)(\forall s)[\text{M}(\text{regret}(x,s)) \rightarrow s]$
        $(\forall x)(\forall s)[\text{M}(\neg\text{regret}(x,s)) \rightarrow s]$

Another important point noticed by Karttunen concerns the inconsistent behavior of some factive verbs in both questions and conditionals. Consider (14) and (15), taken from Karttunen (1971b: 63).

(14)   Did you regret / realize / discover that you had not told the truth?

(15)   If I regret / realize / discover later that I have not told the truth, I will confess it to everyone.

According to Karttunen (1971b: 63), in (14), the speaker is committed to the truth of the proposition in the subordinate clause in the case of *regret* and probably also *realize*, but not in the case of *discover*. With the latter, the sentence fits the scenario where the speaker does not know whether the addressee has told the truth or not, and where she is ready to acknowledge the addressee's discovery as a fact. *Find out* and *see* seem to pattern with *discover* in that they allow for both a factive and a non-factive interpretation in questions. Furthermore, in conditionals presented in (15), not only *discover* but also *realize* can have a non-factive meaning. In the case of these two lexemes, it is only a possibility (and not a necessity) that the speaker did not tell the truth. In contrast, *regret* enforces a that-clause to hold in the actual world. As was mentioned above, conditional sentences trigger a conversational implication stating that the speaker considers it at least possible that the antecedent is true.

The inferences demonstrated in (14) and (15) suggest that one needs to distinguish between verbs like *regret* on the one hand and *discover, realize, find out, see* or *notice* (the so-called **coming-to-know verbs**, cf. Karttunen 2016: 712) on the other. Karttunen (1971b: 65) refers to the second class as **semi-factives**, and proposes distinct semantic representations for the semi-factive (16) and the factive group (17).

(16) $(\forall x)(\forall s)[\text{discover}(x,s) \rightarrow s]$
        $(\forall x)(\forall s)[\neg\text{discover}(x,s) \rightarrow s]$

(17) $(\forall x)(\forall s)[\text{M}(\text{regret}(x,s)) \rightarrow s]$
        $(\forall x)(\forall s)[\text{M}(\neg\text{regret}(x,s)) \rightarrow s]$

The above representations make right predictions with respect to the interpretation of sentences like (18).

(18)   It is possible that I will regret / realize / discover later that I have not told the truth.
        Karttunen (1971b: 64)

The possibility-relation established for *regret* allows for the derivation of the truth-related meaning of the complement sentence (regardless of whether one regrets that *p*, it is the case that *p*; the truth of the complement sentence holds independently of the

attitude expressed by the matrix verb). In contrast, no such possibility-relation holds for the semi-factives. As a result (and as might be desired), the corresponding embedded propositions are not enforced to be true in the actual world (the possibility of realizing / discovering that *p* does not imply that *p*, as opposed to the possibility of regretting that *p*).

For the scenarios where the truth of propositions embedded under semi-factives is left as an open issue, Stalnaker (1974), Gazdar (1979) and van der Sandt (1992) propose a pragmatic-based cancellation of truth-presupposition.

Regarding the classification adapted in this dissertation, **I will use the semantic definition of presupposition based on projection patterns**. The crucial observation about Polish is that all perfective clause-embedding verbs that pass the 'common' projection tests pattern alike (see section 5.2.1.1), even if they differ from the inherently-factive *regret* with respect to their behavior in conditional sentences. Compare (19) vs. (20).

(19) Jeżeli przeczuję / wyczuję / rozgryzę / zgadnę, że to Janek wysyła mi kwiaty (a nie Krzysiek), zerwę z nim kontakt.
'If sense.1SG.PFV.FUT / sense.1SG.PFV.FUT / work.out.1SG.PFV.FUT / guess.1SG.PFV.FUT it right that it is Janek who keeps sending me flowers (and not Krzysiek), I will break contact with him.'
↛ It is Janek who keeps sending me flowers.

(20) Jeżeli będę żałować / pożałuję, że to Janek wysyła mi kwiaty (a nie Krzysiek), zerwę z nim kontakt.
'If regret.1SG.IPFV.FUT / regret.1SG.PFV.FUT that it is Janek who keeps sending me flowers (and not Krzysiek), I will break contact with him.'
→ It is Janek who keeps sending me flowers.

Furthermore, verbs listed in (19) can take interrogative complements, whereas those demonstrated in (20) cannot.

(21) Jeżeli przeczuję / wyczuję / rozgryzę / zgadnę, kto wysyła mi kwiaty, zerwę z tą osobą kontakt.
'If sense.1SG.PFV.FUT / sense.1SG.PFV.FUT / work.out.1SG.PFV.FUT / guess.1SG.PFV.FUT it right who keeps sending me flowers, I will break contact with that person.'
'If I get the right answer to the question *Who keeps sending me flowers*, I will break contact with that person.'

(22) #Jeżeli będę żałować / pożałuję, kto wysyła mi kwiaty, zerwę z tą osobą kontakt.
'If regret.1SG.IPFV.FUT / regret.1SG.PFV.FUT who keeps sending me flowers, I will break contact with that person.'

Although there is a clear difference between (19) and (20) and between (21) and (22), **I will call perfective verbs that pass the negation, adverbial modification and question test "factive". The inference they trigger will be referred to as truth-presupposition**. Regarding Karttunen's classification, it would, however, be better to represent them by the structure in (16). Verbs like *(po)żałować* 'to regret', which are inherently factive independently of aspect, will be called **inherently-factive imperfectives**. They seem to trigger the 'strongest' truth-inference possible. However, inherently-factive imperfectives are beyond the scope of this dissertation.

2.1.2 Pragmatic definition of presupposition

In line with Beaver & Geurts (2014), the pragmatic notion of presupposition is the most significant philosophical alternative to the Frege-Strawsonian account. The most prominent work on the pragmatic approach goes back to Stalnaker (1972), Stalnaker (1973), Stalnaker (1974) and Stalnaker (1998). Stalnaker's account is based on the hypothesis that presuppositions do not necessarily originate from single language units / expressions, but from the speakers' assumptions that are constantly being made in the course of the conversation. More precisely, a pragmatic presupposition of a sentence *A* represents a component of meaning that belongs to the common ground (mutual knowledge between speaker and hearer, cf. Clark & Brennan 1991, Stalnaker 2002) while uttering *A*.

Stalnaker aimed at explaining the inferential split of Karttunen's semifactives (failing the question and/or the conditional test or behaving inconsistently under negation) by means of pragmatic principles. Consider examples (23) and (24), taken from Beaver & Geurts (2014).

(23) **I don't know that** Mullah Omar is alive. I don't know if he's dead either. (General Dan McNeill, Reuters, 19 May 2008: Beaver & Geurts 2014)

(24) **Vader didn't know that** Luke was alive, so he had no intentions of converting Luke to the Sith. (Web example: Beaver & Geurts 2014)

In (23), there is no presupposition stating that Mullah Omar was alive. In contrast, (24) seems to presuppose the truthfulness of the embedded sentence. Crucially, in the former case, *know* occurs with a first person and is marked for the present tense, whereas, in the latter case, it appears with a third person and is marked for the past tense. Following the semantic account, the above observations provide clear restrictions with respect to the conditions that make it possible for *know* to presuppose *p*. Due to the fact that the presupposition does not always hold, *know* should be treated as semi-factive (and not as factive). The problem is that one would need a motivation (or explanation) for this inferential split. Crucially, examples like (23) and (24) are not an issue if considered from the pragmatic point of view. In line with Stalnaker, a verb itself does not have to enforce its complement to be true. As previously mentioned, we can have speaker-

addressee-based creation of presupposition. In (23), after an addressee has heard the first utterance, she is expected to realize that the proposition embedded under *know* cannot be part of the common ground. If it were part of the common ground, the speaker would know about that, and her assumption would turn out to be contradictory (she would not know about something that was meant to be taken for granted). This is how the lack of truth-presupposition in (23) can be explained. In contrast, an addressee can easily infer the truthfulness of *p* in (24). Since *know* typically embeds true propositions and since there is no indication for not assuming so in this case, (24) should presuppose that, in an imaginary world, Luke was alive.

To sum up, in line with Beaver & Geurts (2014), the cancellation of presupposition that was observed with semi-factives might be traced back to the presence of competing conversational inferences. Thus, presupposition is the default as long as it does not lead to pragmatic inconsistencies.

Finally, it needs to be explained why I did not decide to adopt the pragmatic definition of presupposition in my dissertation. My goal is to establish whether we can find basic (related to the meaning of the roots) truth-related differences between the (im)perfective pairs of clause-embedding verbs in Polish. I assume that a good starting point for getting a solid overview of the phenomenon in question is the investigation of inferences that are well-defined. Taking into account distinctions in projection patterns makes it possible to divide particular verb pairs into classes that contain verb pairs that either project or not (so that we end up with clear boundaries between the classes). Furthermore, since the acceptability-judgement study that I conducted (see chapter 9) was meant to capture differences between aspectual minimal pairs, the semantic-based definition of presupposition seemed to provide the most appropriate foundation for preparing the experimental design. However, in order to exhaustively investigate the presuppositional status of given lexemes, one would need to integrate the pragmatic notions (especially the cancellability conditions) into the semantic account. This would be a good follow-up investigation, and therefore it might be a subject for further research.

In the following subsection, I will discuss truth-entailment.

2.2   Truth-entailment

The meaning of entailment has already been sketched in the previous subsection. I will use the terms **to imply** and **to entail** interchangeably. We could say that the first part of the semantic representation of semi-factives illustrated in (16) covers an essential component of the meaning of an entailment. Its definition can be based on Karttunen's (1971a) definition of the so-called **implicative verbs**. Karttunen (1971a) reserves this term for verbs that enforce the truthfulness of their complements in affirmative sentences, but not under negation. These postulates can be specified by means of the following axioms:

(25) $(\forall x)(\forall s)$[manage/remember(to)/succeed/dare(x,s) $\rightarrow$ s]
      $(\forall x)(\forall s)$[¬manage/remember(to)/succeed/dare(x,s) $\rightarrow$ ¬s]

Implicative verbs include, for instance, *manage, remember (to), dare, succeed, see fit*. Natural language examples confirm the accuracy of (25).

(26) Tom managed / remembered / dared to eat the cake / succeeded in eating the cake.
      $\rightarrow$ (implies/entails) Tom ate the cake.

(27) Tom managed / remembered / dared to eat the cake / succeeded in eating the cake, #but he did not eat the cake.

(28) Tom did not manage / remember / dare to eat the cake / did not succeed in eating the cake.
      $\rightarrow$ Tom did not eat the cake.

(29) Tom did not manage / remember / dare to eat the cake / did not succeed in eating the cake, #but he ate the cake.

Examples (26)–(29), based on Karttunen (1971a: 342–343), show that *manage, remember, dare* and *succeed* entail (but do not presuppose) the truthfulness of their complement sentences.

Consider again:

(30) Tom ate the cake.

(31) Tom did not eat the cake.

We can identify the following entailment patterns (cf. Karttunen 1971a: 343):

(32) (26) $\rightarrow$ (30)

(33) (28) $\rightarrow$ (31)

(34) ¬(26) $\rightarrow$ ¬(30)

However, note that (26) and (30) are not logically equivalent, i.e. (26) $\not\equiv$ (30), because we cannot assume that (30) $\rightarrow$ (26). For instance, in line with Karttunen (1971a), *manage to p* presupposes trying to make *p* true (and it also conventionally implicates dealing with some difficulties in the process of getting to *p*, a.c.). This inference is, however, absent from (30); its negated version (31) remains true if Tom did not make any attempt to eat the cake (*Tom did not eat the cake, he was not interested in it at all* is fine, but *Tom did not manage to eat the cake, he was not interested in it at all* seems odd). Based on this, (31) implies (28) only if the above-described presupposition is

fulfilled. Furthermore, [x did not remember to p → x did not p] does not imply that [x did p → x remembered to p]. For this reason, Karttunen (1971a: 344) adopts the weaker notion of implication as proposed by Austin (1962). Following this notion, p implies q means that, whereas the speaker is committed to q while asserting p, she is not committed to ¬p by asserting ¬q.

In the following, implicative verbs / verbs that trigger truth-entailment on their propositional complements will be referred to as **veridical**.

The notion of veridicality was discussed by Montague (1969), and explained by means of existence. For example, if a sentence *I see a dinosaur* is true, it implies the existence of a dinosaur, and, as a result, it confirms the veridicality of *see*.

To sum up, I will follow Egré (2008: 101) and define veridicality via entailment. **I will call a verb V veridical if it entails the truth of its complement when used in the positive declarative form, i.e. when the following condition is fulfilled: $Vp → p$ for all p, where p is a that-clause** (cf. also Giannakidou 1994, Giannakidou 1998, Giannakidou 1999, Zuchewicz 2018: 479).[1]

In the next subsection, I will discuss the notion of implicature.

2.3 Truth-implicature

In line with Grice (1975) or Davis (2014) among others, the term **implicature** refers to a component of meaning that can be inferred from an utterance without being said / directly communicated. Therefore, in contrast to previously mentioned presupposition and entailment, implicature is a pragmatic phenomenon (at least as defined in this

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[1] It is worth mentioning that Giannakidou (2013) analyzes the progressive as an actualization function and defines veridicality via actuality. Giannakidou (2013) shows that the progressive entails the partial physical realization of an event in the actual world (partial actualization), which can be confirmed by the fact that it does not license negative polarity items. For instance, one cannot say: #*Tom was crossing any street yesterday*, because the progressive form of 'to cross' implies that there was/is an event *e* of Tom's crossing the street in the actual world but it was/is not necessarily completed. This shows that actualization can be applied to partial events. Similarly, in Polish, the sentence *Marek częściowo udowodnił, że to Jarek jest winny* 'Marek partly proved.PFV that Jarek was guilty' means that all steps that were completed by Marek by the time of utterance suggest Jarek's guilt, but the evidence available is too weak to judge an embedded proposition as true (the sentence could be followed by *but he (Marek) interrupted the investigation and changed his job*). Interestingly, the imperfective variant of 'to prove' seems to be very odd (if not ruled out) with *częściowo*, which results from the fact that the imperfective 'prove' in itself implies the existence of parts.
The above examples suggest that proof has parts; cf. also Lahiri (2002) who assumes part structures of questions based on acceptability of sentences like *John **partly knows who** did well on the exam yesterday*, cf. Lahiri (2002: 53). I will discuss this issue in the further part of this dissertation.

dissertation).[2] Implicatures can originate from the meaning of certain language expressions (in this case, they tend to be 'stronger' and their pragmatic status is debatable), or from the conversational background. Common implicature triggers are for instance metaphor, irony and understatement. Grice (1975) was the first one who to analyze cases where the speaker's intention did not correspond to the literal meaning of her utterance. Consider example (35).

    (35)   A: Are you going to the cinema tonight?
              B: I am having dinner with my parents.

In (35), B meant (but did not say) that she is not going to the cinema tonight. More precisely, she said that she was having dinner with her parents and implicated (or indirectly communicated) that she is not going to the cinema; the last mentioned part is the implicature. According to Searle (1975) or Davis (2014), if the speaker implicates something, she is performing an indirect speech act. In (35), by performing one speech act (stating that she is having dinner with her parents), B performed another speech act (stating that she is not going to the cinema).

Furthermore, based on Grice (1975) and Davis (2014), the implicature illustrated in (35) is the so-called **conversational implicature**; it does not result from the conventional meaning of any expression, but from the given conversational context. For instance, in the dialogue presented in (36), the implicature that appeared in (35) – stating that B is not going to the cinema – vanishes.

    (36)   A: What are you doing tonight?
              B: I am having dinner with my parents.

An important characteristic of conversational implicatures is their cancellability, as illustrated by the following example.

    (37)   i.   Some dogs bark.
            ii.   Not all dogs bark.

(37)i. implicates (37)ii. We can assume that, if the speaker meant that all dogs bark, she would have said so. Crucially, in line with Davis (2014), *not all* is not part of the meaning of *some*. Therefore, *not all* is not a conventional implicature of *some*; rather, it is conventional to conversationally implicate that *some* means *not all*. This reasoning is based on the **cooperative principle** (Grice 1975) that establishes rules for successful communication. Speaker and hearer act cooperatively by following four maxims. First, there is the maxim of quantity stating that the speaker should be as informative as is

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[2] However, Abrusán (2011), Romoli (2012) and Romoli (2015) among others suggest the possibility of treating some presuppositions as scalar implicatures. This completes the previous discussion about presupposition triggers that might in fact represent different (sub)phenomena.

necessary for the purpose of the conversation. Second, there is the maxim of quality stating that the speaker should not provide any false or non-proven information. Third, there is the maxim of relevance that requires participants to say only what is relevant for successful communication. Finally, there is the maxim of manner that highlights the need for the pursuit of clearness, briefness and organization of information, and the avoidance of ambiguities or obscurities. For example, in (37), saying *some dogs bark* in the context where all dogs do would suggest that the speaker does not provide as much information as is required, and, as a result, that she is not following the maxim of quantity. However, and as mentioned above, the implicature 'some, but not all' can easily be canceled, for instance after continuing the sentence with *actually, all (dogs) do* or its reformulation as *Some, if not all dogs bark*.

Another type of implicature is the already mentioned **conventional implicature**. It is triggered by a particular language unit and does not depend on conversational circumstances. For this reason, it cannot be canceled. Davis (2014) refers to this type of implicature as semantic implicature. Compare (38), adapted from Davis (2014).

(38)   i.   Jill is English and therefore brave.
            ii.   Jill is English and brave.
            iii.   Jill's being brave follows from her being English.

In line with Davis (2014), in (38), speakers who utter i. implicate iii. The implicature that 'Jill's being brave results from her being English' is activated by *therefore* (i.e. by a particular lexical item). This can easily be confirmed by the fact that, in contrast to i., ii. does not implicate iii.

In addition to lexically-driven implicatures, there are also syntactically-driven implicatures. Potts (2005) and Potts (2007) discuss appositive constructions as implicature-triggers. Consider the following example.

(39)   Anna, my lovely friend, is coming to the party tonight.

Example (39) implicates that Anna is the speaker's lovely friend (the speaker implies it, but does not say it, cf. Davis 2014). However, the implicature is not implicated if the speaker is in conflict with Anna and uses the sentence ironically. In this case, what is implicated is the exact opposite of what (39) literally says.

Obviously, the inference triggered by the semantic implicature is usually stronger than (and different in nature from) the one triggered by the conversational implicature. For that reason, the question arises whether semantic and conversational implicature should be treated as one phenomenon at all.

A meaningful counterpart to the Gricean notion of implicature is **relevance theory** as proposed by Sperber & Wilson (1986b), Sperber & Wilson (1987) or Sperber & Wilson

(2004). Relevance theory focuses on the notion of maximal relevance, which is intended to replace the four maxims introduced by Grice. Davis (2014) suggests the following Gricean-style formulation of the principle of maximal relevance (based on Sperber & Wilson 1986a, Sperber & Wilson 1986b: 46–51;118–71, Sperber & Wilson 1987: 702–704):

> (40)   Principle of Maximal Relevance (Communicative Efficiency): Contribute that which has the maximum ratio of contextual effects to processing cost.

Following Sperber & Wilson (2004: 609), from the set of alternatives (41), (42) and (43), (41) is the maximally relevant alternative. This is due to the observation that (41) not only contains the meaning of (42), but also provides some additional information. Furthermore, there seems to be no difference in processing effort between the two sentences. In contrast, whereas (43) is as informative as (41), the former is more difficult to process. As a result, (41) is the most appropriate candidate.

> (41)   We are serving chicken.

> (42)   We are serving meat.

> (43)   We are serving chicken or $(7^2 - 3)$ is not 46.

Perfective communication verbs in Polish ('say', 'inform', etc.) seem to implicate that the complement sentence is true. This implicature could be explained by means of relevance. If the speaker aims at communicating / reporting a statement that she considers true, she chooses the perfective, because perfective verbs tend to embed true propositions. More precisely, from the set of two aspectual alternatives, the perfective is maximally relevant for reporting true statements, although both the perfective and the imperfective would be acceptable in such cases.

The truth-implicature of the perfective aspect in Polish does not pattern consistently as suggested by Gricean terminology. On the one hand, it behaves like a conventional implicature, since it results from the meaning of the perfective aspect. On the other hand, however, it is cancelable, which is the main characteristic of a conversational implicature. As a result, we end up with a cancelable conventional implicature, which I will call optional pragmatic enrichment.

The placement of the above-described inference between conventional and conversational implicature provides another piece of evidence for the difficulties in definitional transparency within the phenomena falling under the term truth-inference. **Giving the label truth-implicature to the inference that is triggered by perfective communication verbs in Polish is based on its cancelability/optionality.**

In the next section, I will briefly discuss the category of aspect.

3 The category of aspect: Overview

In both Slavic and general linguistic literature, the Slavic aspect is considered a grammatical category with a specific distribution. For instance, it can be observed that only imperfective verbs can occur as complements of phasal verbs like 'begin' or 'finish'. This is due to the fact that the perfective, in contrast to the imperfective, implies temporal delimitation of the events it applies to. Zaliznjak & Šmelev (2000), Borik (2002) among others discuss further diagnostic tests for the grammatical status of the category of aspect in Slavic languages.

Apart from the perfective – imperfective distinction, the telic and atelic nature of events needs to be taken into account. Telicity refers to the orientation towards reaching a natural end point (cf. for instance Garey 1957, Krifka 1989b, Krifka 1992).[3] Perfective marking tends to favor telic interpretation of events, whereas imperfective marking usually leads to an atelic reading. As example (44) illustrates, it is the (im)perfective aspect of the complement verb (and not telicity) that determines its compatibility with phasal verbs in Polish. Example (45) shows that the (im)perfective marking on the phasal verb does not affect the inference pattern. (46) demonstrates that telicity within a matrix clause does not matter either.

(44) Ola zaczęła   / skończyła   pisać   / #popisać
     Ola started.PFV / finished.PFV write.**IPFV.ATEL** / write.**PFV.ATEL**
     / #napisać   tekst.
     / write.**PFV.TEL**   text
     'Ola started / finished writing a text.'

(45) Ola zaczynała   / kończyła   pisać   /
     Ola started.**IPFV** / finished.**IPFV** write.IPFV.ATEL   /
     #popisać   / #napisać   tekst.
     write.PFV.ATEL / write.PFV.TEL   text
     'Ola was about to start / finish writing a text.'

(46) Ola pokończyła   pisać   / #popisać
     Ola finished.**PFV.ATEL**   write.IPFV.ATEL / write.PFV.ATEL
     / #napisać   tekst.
     / write.PFV.TEL   text
     'Ola finished writing a text {for now}.'

The above examples reveal the necessity of distinguishing between perfectivity (the (im)perfective marking on a verb stem that causes delimitation in the case of the perfective) and telicity (a property of a complex verbal expression that implies its orientation towards reaching a natural end point). We saw that phasal verbs can only

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[3] See also the German term **Zeitkonstitution**, cf. Francois (1985).

combine with perfective complement verbs. The reason why neither *po-* nor *na-* derivates can cooccur with phasal verbs is that such a cooccurrence would result in a double marking of a temporal boundary of events described by the complement, regardless of the nature of a temporal delimitation that is enforced by the respective prefix (the presence – with *na-* – or the absence – with *po-* – of the reaching a natural end point).

In the next subsections, perfectivity and telicity will be discussed in greater detail.

3.1 Perfectivity

3.1.1 Comrie (1976)

One of the first widely-cited definitions of aspect was proposed by Comrie (1976: 3). He defines aspect with respect to different ways of viewing the internal temporal structure of a situation. With the perfective, a situation is seen as a single whole, without being divided into separate phases/parts that characterize that situation. With the imperfective, we focus on the internal constituency of the situation. As a result, we are looking at an event from the outside in the case of the perfective, and from the inside in the case of the imperfective.

Furthermore, Comrie (1976: 16) notices that, in Russian, perfective and imperfective are not complementarilly distributed with respect to the duration of the verbal event that is in their scope. Previously it was suggested that the perfective refers to situations with short duration and the imperfective to situations with long duration. However, as can be seen from the possible Russian realizations of the English sentence *I stood there an hour*; the perfective can refer to events that last either a short or a long time, depending on the derivate.

> (47) I stood there for an hour.
> Ja stojal.**IPFV** tam čas.
> → Neutral with respect to the duration of an event.
> Ja postojal.**PFV** tam čas.
> → A subjectively short period is suggested.
> Ja prostojal.**PFV** tam čas.
> → A subjectively long period is suggested.
> Adapted from Comrie (1976: 17)

Consider the Polish equivalents of (47).[4]

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[4] The translation is my own.

(48) I   stood   there   for   an   hour.
      Ja   stałam.**IPFV.ATEL**   tam   godzinę.
      → Neutral with respect to the duration of an event.
      Ja   postałam.**PFV.ATEL**   tam   godzinę.
      → A subjectively short period is suggested.
      Ja   stanęłam.**PFV.TEL**   tam   na   godzinę.
      → Neutral with respect to the duration of an event.

It seems that the subjectively short duration of an event denoted by the perfective verb in both Russian and Polish results from the nature of the delimitative prefix *po-* (so it is more a matter of Aktionsart[5] than aspect). An unusual combination of the features [+ perfective] and [– telic] might also give rise to the above-mentioned interpretation.

A crucial point made by Comrie (1976: 18) concerns the frequent characterization of perfectivity as denoting a completed (in contrast to complete) action. Following Comrie, whereas the perfective does indicate a complete situation (with beginning, middle and end), it does not necessarily mark completedness / termination of the situation itself. In Polish, many perfective *po*-derivates do not imply that a situation/an event is completed:

(49) Ola **po**czytała   książkę,   ale   jej   nie   skończyła.
      Ola read.**PFV.ATEL** book   but   her   NEG   finished.PFV
      'Ola read {some parts of the book}, but she did not finish the whole book.'

Compare with (50) and (51).

(50) Ola czytała   książkę,   ale   jej   nie   skończyła.
      Ola read.**IPFV.ATEL** book   but   her   NEG   finished.PFV
      'Ola was reading a book, but she did not finish it.'

(51) Ola **#prze**czytała   książkę,   ale   jej   nie   skończyła.
      Ola read.**PFV.TEL** book   but   her   NEG   finished.PFV
      'Ola read the book, but she did not finish it.'

Comrie pointed out crucial properties of perfectivity that hold for languages with and without the grammatical category of aspect. However, we need a more fine-grained division of features in order to distinguish between different sub-phenomena.

Essentially, two related types of approach have been applied in Slavic linguistics as well. Originally, the perfective aspect was defined via the totality of a situation (cf. Koschmieder 1928 for Polish, Maslov 1948, Isačenko 1968 for Russian, and to some extent Dickey 2000). Later, the focus was put on reaching a boundary or on selecting a

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[5] Aktionsart can be seen as a lexical-semantic specification of a verb / group of verbs derived by means of a particular affix (cf. Czochralski 1975, Kozłowska-Raś 1987).

time span that includes a boundary (consider Vinogradov 1974, Sonnenhauser 2006, Sonnenhauser 2008 for an exact definition).

In the following, I will discuss the notions of (im)perfectivity proposed by Klein (1994).

3.1.2 Klein (1994)

Klein distinguishes between three types of situation that constitute a basis for his definitions of tense and aspect. Consider example (52).

(52) *Martyna was tired.*

Following Klein (1994: 3), based on example (52), the three time-related components of meaning can be described as follows. First, there is the time of Martyna being tired, and this time can be referred to as **time of situation** (TSit). Second, there is the time to which the assertion in (52) applies (the time for which the assertion was made) that is called **topic time** (TT). Third, there is the time at which the speaker makes her utterance, and this time is called **time of utterance** (TU). The situation itself – Martyna's being tired – belongs to the non-finite component of meaning. As a result, TSit is non-finite too. In contrast, TT is finite (in the above example, the reference is to the past, so the topic time is located in the past). Different relations can hold between TSit, TT and TU. All these relations establish both the temporal and aspectual properties of a given expression. For instance, in (52), TU is located after TT. Importantly, it cannot be excluded that Martyna was still tired at the speech time; if this was the case, TSit would include TU. Therefore, it is rather TT than TSit that is directly related to TU (in the sense that it is rather the reference to the past and not the actual duration time of a situation that precedes TU). The relation between TT and TU is characterized by tense.

What matters for the purpose of this dissertation is the time-based definition of aspect. Klein (1994) and Klein (1995: 24) among others define aspect via the interaction between TT and TSit, or, more precisely, via anchoring a situation to the topic time. The perfective indicates that the end of TSit and the beginning of time after TSit are included in TT, leading to a completeness interpretation. Compare (53) for English.

(53) *X walk<u>ed</u> to the store → X arrived at the store.*

In contrast, in the case of the imperfective, TT is part of TSit, hence the end of TSit is not included in TT. This is shown in (54), the imperfective counterpart of (53).

(54) *X was walk<u>ing</u> to the store ↛ X arrived at the store.*[6]

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[6] These observations go back to Aristotle, cf. Mourelatos (1978).

Consider the Polish perfective variants of 'to go' / 'to walk'.

(55) Ola **we**szła   do   sklepu. →   Ola   jest   w   sklepie.
Ola **went.PFV**   to   store   Ola   is   in   store
'Ola entered the store → Ola is inside the store (Ola covered the entire path).'

(56) Ola **do**szła   do   sklepu. →   Ola   jest   przy   sklepie.
Ola **went.PFV**   to   store   Ola   is   by   store
'Ola arrived at the store → Ola is at the store / in front of the store (Ola covered the entire path).'

(57) Ola **wy**szła   do   sklepu. →   Ola   jest   w   drodze   do
Ola **went.PFV**   to   store   Ola   is   in   way   to
sklepu.
store
'Ola went to the store → Ola is on her way to the store (Ola left her primary location).'

In both (55) and (56), the situation can be described as <Ola go to store>. The perfective indicates that Ola covered the whole path, i.e. that she is not walking anymore; she either entered the store (55) or arrived at the store (56). In (57), the situation can be described as <Ola leave her primary location towards store>. Here, the perfective relates to the time of Ola's leaving her primary location; the time of leaving is completed and she is already on her way to the store. The above examples show that, regardless of the Aktionsart denoted by the respective perfective morpheme (resultative in (55) and (56) and inchoative in (57)), the perfective operator in Polish fulfills the same function that was attested by Klein for the English perfective; it implies that TT contains the end of TSit and the beginning of time after TSit.

The meaning of the Polish imperfective also patterns with the definition proposed by Klein:

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(58) Ola szła   do   sklepu.   ↛   Ola jest w   sklepie.
      Ola went.IPFV   to   store   Ola is   in   store
                                         ↛   Ola jest przy sklepie.
                                             Ola is   by   store
                                         ↛   Ola jest w   drodze   do
                                             Ola is   in   way   to
                                             sklepu.
                                             store.
                                         →   Ola była w   drodze   do
                                             Ola was   in   way   to
                                             sklepu.
                                             store.

The difference between (57) and (58) lies in the lack of the pre-state condition in the latter case. In the former case, the pre-state condition is realized by marking the left boundary of an event. In (58), the reference is only to the event of going that took place in the past. TT (past) is part of TSit <Ola go to store>, because the situation is temporally unlimited (neither left nor right boundary of an event is marked). For that reason, the situation described in (58) could potentially still hold at the speech time.

It seems that the time-based definition of perfectivity makes it possible to capture the difference between the perfective and the imperfective regardless of whether aspect is a grammatical category in a language.

In the following, the terms **perfective** / **imperfective** will only be used to refer to aspectual marking on the verbal stem. Non-verbal elements within the VP will not contribute to the meaning of perfectivity.

In the next subsection, I will discuss telicity – the notion of aspectuality that includes the meanings of both a verb and its non-external arguments.

3.2   Telicity

Whereas the perfective – imperfective distinction is established on the basis of morpho-semantic features of the verb, telicity is an aspectual property of an entire predicate (verb and its arguments). The features [± telic] can be subsumed under the term **temporal constitution** (cf. Francois 1985, Krifka 1989a among others).

I will begin with and focus on Vendler's (1957) classification of aspectual classes, since they play a crucial role in triggering the relationship between perfectivity and truthfulness in Polish (which means that we need both perfectivity and telicity in order to get the truth-inference).

3.2.1   Vendler (1957) on four verb schemata

Vendler (1957) distinguishes between the following verb schemata (aspectual classes): activities (59), accomplishments (60), achievements (61), and states (62).

(59)   *run, push a cart, think, write, eat*

(60)   *run a mile, draw a circle, write a letter, eat an apple*

(61)   *reach the top, win the race, recognize, find*

(62)   *love, dominate, know, have*

Activities and accomplishments can be subsumed under the term **processes**. Following Vendler (1957), activities and accomplishments, in contrast to achievements and states, can appear in the progressive, which means that they exhibit an internal (part) structure. Consider the following examples.

(63)   *Anna is running / pushing a cart / thinking / writing / eating.*

(64)   *Anna is running a mile / drawing a circle / writing a letter / eating an apple.*

(65)   *Anna is ?reaching the top / ?winning the race / *finding a key.*

(66)   *Anna is ?loving it / ?hating it / *knowing it.*[7]

Based on Vendler (1957), what we can conclude from the above examples is that activities and accomplishments pattern alike in that they allow for the non-restricted occurrence of the verb in the progressive form. How they differ is in their orientation

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[7] I have put a question mark before some verbs in the examples (65)–(66), because, first, one can easily find instances of achievements (especially *reach* and *win*) used in the progressive form. Importantly, it is not reaching or winning itself that can be extended in time. According to Vendler (1957: 147), if one says that it took her two hours to reach the summit, one refers to the time of climbing to reach the top; the moment of reaching the top itself is a punctual event that is non-extendable. In line with Moens & Steedman (1988), the progressive coerces an expression it applies to (for instance a punctual event) to be a process. They refer to this phenomenon as aspectual coercion. In contrast, if one reads a newspaper in one hour (accomplishment VP), one can say 'I am reading a newspaper' at any time during that hour. Therefore, it seems that it is not necessarily the progressive, but rather the time span it refers to that differentiates between activities and accomplishments on the one hand, and achievements on the other. Second, also states allow for the progressive under certain circumstances, which can be confirmed by the famous McDonald's slogan "i'm lovin' it". Certainly, however, it is more likely (and more natural) for activities and accomplishments to appear in the progressive than achievements and states.

towards reaching a natural endpoint (telicity); whereas activities are atelic (they do not imply a natural endpoint), cf. (67) and (68), accomplishments are telic (they imply a natural endpoint), cf. (69) and (70).

(67) *For how long did Anna run / eat / write?*

(68) **How long did it take to run / eat / write?*

(69) **For how long did Anna run a mile / eat the sandwich / write the poem?*

(70) *How long did it take to run a mile / eat the sandwich / write the poem?*

Furthermore, the well-formedness of a predicate with either a 'for an hour'-type adverbial (durative adverbial) or with an 'in an hour'-type adverbial (time-span adverbial)[8] makes it possible to distinguish not only between activities and accomplishments, but also between atelic and telic event descriptions in general.

Crucially, perfective accomplishment clause-embedding verbs in Polish (where accomplishment is realized by the combination perfectivity plus incrementality) are systematically veridical. On the interpretational level, they pattern with perfective accomplishment incremental theme verbs that take nominal complements and trigger their definite or quantized interpretation. This suggests that there is an interaction between definiteness and veridicality.

Coming back to Vendler's (1957) classification, the question remains as to how one can formally differentiate between achievements and states (for now we only know that both are rather strange with the progressive). Since the former are punctual and the latter can extend over time, we can build the following minimal pairs (adapted from Krifka 1989b: 99):

(71) *At what moment [did you reach the top]? At 2 o'clock.*

(72) **At what moment [did you hate him]? At 2 o'clock.*

(73) **For how long [did you reach the top]? For two hours.*

(74) *For how long [did you hate him]? For two hours.*

It can easily be seen that achievements and accomplishments are telic, and activities and states atelic.

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[8] For the terminology cf. Krifka (1989b: 99).

In the next subsection, I will introduce some tests that make it possible to differentiate between telic and atelic predicates.

3.2.2   Telicity tests

I will start with the adverbial modification test (cf. Verkuyl 1972, Dowty 1979, Hinrichs 1985). The adverbial modification test was briefly mentioned in the previous subsection. Whereas atelic predicates, cf. (75), can only be modified by durational adverbials, telic predicates, cf. (76), only combine with time-span adverbials. Consider the following examples.

(75)   *Inga ate / drank for an hour/*in an hour.*

(76)   *Inga ate the sandwich / drank the wine *for an hour/in an hour.*

We can build similar pairs with imperfective (77) and perfective (78) clause-embedding verbs in Polish.

(77)   Ola   przez   godzinę / * w   godzinę
        Ola   for   hour   /   in   hour
        przewidywała   / udowadniała   / mówiła,
        predicted.IPFV / proved.IPFV   / said.IPFV
        że   Marek   boi   się   duchów.
        that   Marek   fears.IPFV REFL   ghost.PL
        'Ola was predicting / proving / saying for an hour / in an hour that Marek fears ghosts.'

(78)   Ola * przez   sekundę[9] / w   sekundę
        Ola   for   hour   / in   second
        przewidziała   / udowodniła   / powiedziała,
        predicted.PFV / proved.PFV   / said.PFV
        że   Marek   boi   się   duchów.
        that   Marek   fears.IPFV REFL   ghost.PL
        'Ola predicted / proved / said for a second / in a second that Marek fears ghosts.'

The above examples show that perfective verbs tend to be telic, whereas imperfective verbs are atelic.

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[9] Since perfective *przewidzieć* is an achievement (it denotes a punctual event), I decided to use 'second' instead of 'hour' within an adverbial clause. As a result, the phrase is compatible with all perfective verbs independently of the aspectual class they belong to (in the sense of Vendler); perfective *udowodnić* and *powiedzieć* are accomplishments.

Another common test for telicity is the conjunction test (cf. Verkuyl 1972, Borik 2002: 14):

(79) *Eli was happy on Thursday and on Friday.*

(80) *Eli reached the hilltop on Thursday and on Friday.*

In the atelic sentence (79), there are two possible interpretations available. First, there were two distinct temporally-independent (non-overlapping) situations of Eli being happy: one took place on Thursday and the other one on Friday. Second, there was one continuous situation of Eli being happy that lasted from Thursday till Friday. In the telic sentence (80), however, there must have been two independent situations of Eli reaching the hilltop (so that he reached the hilltop twice: once on Thursday and once on Friday). The continuous reading is ruled out (cf. also Borik 2002: 14).

The same observation holds for Polish aspectual pairs investigated in this dissertation:

(81) Ola   w   niedzielę   i   w   poniedziałek   przewidywała,
      Ola   on   Sunday   and   on   Monday   predicted.IPFV
      że   Marek boi   się   duchów.
      that   Marek fears.IPFV REFL   ghost.PL
      'On Sunday and on Monday, Ola was predicting that Marek fears ghosts.'

(82) Ola   w   niedzielę   i   w   poniedziałek   przewidziała,
      Ola   on   Sunday   and   on   Monday   predicted.PFV
      że   Marek boi   się   duchów.
      that   Marek fears.IPFV REFL   ghost.PL
      'On Sunday and on Monday, Ola predicted that Marek fears ghosts.'

In the imperfective variant (81), either two temporally independent predicting situations took place (one on Sunday and the other one on Monday), or there was one uninterrupted predicting situation that lasted from Sunday till Monday (and probably longer). In contrast, in the perfective variant (82), there could only have been two distinct predicting situations. For instance, in order to verify if tarot cards told the truth on Sunday, the fortune-teller repeated the procedure on Monday and received the same message, i.e. that Marek fears ghosts; therefore, she predicted it twice, during two different predicting events.

In the next section, I will discuss the relationship between perfectivity and telicity.

3.3   The relationship between perfectivity and telicity

The results of telicity tests suggest that imperfective clause-embedding verbs in Polish refer to atelic event descriptions, whereas perfective clause-embedding verbs refer to

telic event descriptions. However, regardless of their lack of compatibility with time-span adverbials, imperfective clause-embedding verbs can fit the telic domain as well.

Consider a scenario where it is discourse-given that Cory had immigrated to Canada. Mila was happy, because she thought that she was the only one who knew about it. Until Mark said:

(83)   Ela   też   mówiła   /   opowiadała   /   twierdziła,
         Ela   also   said.IPFV /   told.IPFV   /   claimed.IPFV
         że   Cory wyemigrował   do   Kanady.
         that Cory immigrated.PFV   to   Canada
         'Ela was also saying / telling / claiming that Cory had immigrated to Canada.'

In the above context, (83) applies to a situation with a terminal point, despite the imperfective marking on the embedding verbs. (83) implicates that the hearer received the complete message from the speaker (which is the actual meaning of perfective communication verbs). However, out of the blue and without *też*, (83) could be followed by *but she was interrupted by a phone call and did not get to the main point* (in this case, the speaker, in contrast to other addressees of Ela's message, knew that Ela was about to say that Cory had immigrated to Canada).

It seems that most (if not all) imperfective clause-embedding verbs in Polish are compatible with telic event descriptions. This is not the semantic property of the imperfective however, but the pragmatic-based extension of its scope; since the context makes it clear that the reference is to a telic event, the speaker can use the imperfective that is less marked in order to avoid overload of information (telicity would be expressed twice by choosing the perfective). A similar observation holds for cases where the imperfective aspect receives a factive reading, see chapter 0.

Furthermore, Borik (2002) shows that the perfective aspect in Russian goes along with atelic event description. Consider the following examples, adapted from Borik (2002: 55).

(84)   Petja   poiskal   knigu   polčasa.   →
         Peter PFV-look.for-PST.SG.M book-ACC   half-hour
         Petja   poiskal   knigu   15   minut.
         Peter PFV-look.for-PST.SG.M book-ACC   fifteen minutes.
         'Peter looked for a book for half an hour → Peter looked for a book for fifteen minutes.'

(85) Petja   poiskal   knigu   polčasa
     Peter   PFV-look.for-PST.SG.M   book-ACC   half-hour
     /   * za   polčasa.
     /   in   half-hour
     'Peter looked for a book for half an hour / in half an hour.'

Reference to atelic events can also be attested for the Polish perfective, but the compatibility with durational adverbials (and its lack with time-span adverbials) only holds for perfective derivates built by means of the delimitative prefix *po-* (cf. Młynarczyk 2004 among others):

(86) Ala   poczytała   (trochę)   przez   godzinę
     Ala   read.PFV   (a little bit) for   hour
     / * w   godzinę.
     /   in   hour
     'Ala read a little bit for an hour / in an hour.'

As example (87) illustrates, the resultative variant of the perfective 'to read' only combines with a time-span adverbial.

(87) Ala   przeczytała   książkę   * przez   godzinę
     Ala   read.PFV   book   for   hour
     /   w   godzinę.
     /   in   hour
     'Ala read the book for an hour / in an hour.'

The examples presented in this subsection clearly show that there is no 1:1 relationship between perfectivity and telicity, although there is a systematic logical tendency for perfective verbs to refer to telic, and for imperfective verbs to refer to atelic event descriptions. Regarding clause-embedding predicates, the question arises as to which category is the actual trigger of truthfulness.

3.4 What is the actual trigger of truthfulness?

As was mentioned before, my object of investigation are transitive dynamic clause-embedding verbs that allow for the telic interpretation of events regardless of the (im)perfective marking on a verbal stem. Since the object argument is always realized by a proposition (i.e. I do not modify the type of a complement), I do not expect it to affect the inference pattern. Crucially, whereas clause-embedding (im)perfective minimal pairs differ in the truth-related meaning of their complement sentences, they do not necessarily differ in telicity. This suggests that it is primarily perfectivity that interacts with factivity / veridicality. Furthermore, it seems plausible that the feature [+ perfective], which is cross-linguistically more marked than the feature [– perfective], interacts with the more specific features [+ factive/+veridical] (relating to the pair [± factive/± veridical]). For that reason, I consider perfectivity a requirement for

truthfulness. However, different aspectual classes determine the exact specification of a truthfulness-feature (its realization as factivity, veridicality or implicature).

In the following, I will discuss the influence of aspect on the interpretation of nominal arguments. This is the basis for the main topic of this dissertation – the role of aspect in interpreting sentential complements.

4 Aspect and the interpretation of nominal complements

4.1 Aspect-dependent interpretation of bare objects in Slavic languages

Aspectual distinctions affect not only the temporal interpretation of a sentence, but also the interpretation of nominal complements of a verb. Wierzbicka (1967) shows that, in Polish, a direct object is interpreted as non-limited or indefinite in an imperfective sentence like (88), and as definite in a perfective one like (89).

> (88) Ola jadła   pierogi   / cukierki.
>   Ola ate.IPFV   dumpling.PL / sweet.PL
>   'Ola was eating dumplings / sweets.'

> (89) Ola zjadła   pierogi   / cukierki.
>   Ola ate.PFV   dumpling.PL / sweet.PL
>   'Ola ate all of the dumplings / sweets.'

In line with Filip (2005: 127), the only formal difference between examples like (88) and (89) lies in the presence of the prefix *z-* in the latter case. Regarding semantics, the distinction between the two sentences is determined by aspectual semantics only; the prefix *z-* does not carry any unique idiosyncratic meaning of its own, therefore, it does not modify the lexical content of an underlying imperfective verb.

The perfective *zjadł(-a)* means 'eating up' / 'finishing eating', i.e. its denotation is restricted to completed events. In contrast, the imperfective *jadł(-a)* is neutral with respect to the completion condition. These aspect-dependent differences in the temporal restriction of verbal events have an influence on the referential properties of bare object arguments too. In (88), with the imperfective *jadła*, *pierogi* 'dumplings' and *cukierki* 'sweets' can have the weak-existential ('some' / zero article), the definite referential or the partitive interpretation ('some of the dumplings / sweets'). Besides that, iterative and generic readings are also possible. Linguistic and extra-linguistic contexts specify which interpretation is available in the particular case. In contrast, in the perfective sentence (89), the reference is to one object; a certain, definite group of objects – the dumplings / sweets (adapted from Wierzbicka 1967: 2238). Following Filip (2005: 127), the meaning of the NPs 'dumplings' / 'sweets' as objects of perfective verbs in Polish is more or less equivalent to the meaning of the respective English NPs marked with the definite article *the* (the so-called referential definites). We can test for it by using the quantifier *all* or totality terms like *whole, entire, total*. Combining (89) with *but she did not finish them {dumplings, sweets} / but there are still some dumplings / sweets left* leads to a contradiction. The property of bare accusative objects as prototypical referential definites under the scope of perfective aspect can be confirmed by means of their coreferentiality with anaphoric expressions. (89) can be followed by *Niestety miały <u>one</u> {pierogi, cukierki} dziwny smak*. 'Unfortunately, <u>they</u> {dumplings, sweets} tasted strange'. This means that, in (89), there is a referential identity between

the pronoun and the bare direct object that is the pronoun's antecedent. However, it needs to be pointed out that a pronoun can also be used to refer to objects of imperfective verbs; in this case, the definite referential interpretation of nominal complements is a possible, but not an obligatory interpretation.

The relationship between aspect and definiteness also holds for Czech, cf. Filip (1985), Filip (1997), Filip (1999) amongst others. Consider the following examples.

(90) Ivan vypil   čaj.
      Ivan drank.PFV   tea
      'Ivan drank (up) (all) the tea / the whole portion of tea.'
      Adapted from: Filip (1999: 10)

(91) Ivan pil   čaj.
      Ivan drank.IPFV   tea
      (i)   'Ivan drank (some/the) tea' (… and then went home)
      (ii)   'Ivan was drinking (some/the) tea' (… when I came)
      Adapted from ibid.

(92) Ivan snědl   jablka.
      Ivan ate.PFV   apple.PL
      'Ivan ate (up) (all) the apples.'
      Adapted from ibid.

(93) Ivan jedl   jablka.
      Ivan ate.IPFV   apple.PL
      'Ivan ate / was eating (some/the) apples.'
      Adapted from ibid.

Furthermore, Forsyth (1970: 92) observes that, in Russian, the objects of imperfective verbs build a "coalesced unit" with a verb, and that they lack a specific reference. In contrast, the objects of perfective verbs receive a specific interpretation. Similar observations were made by Birkenmaier (1979), Padučeva (1996) or Anstatt (2002). The effect of the Russian perfective is illustrated in (94).

(94) Masha   sjela   prjanik.
      Masha   ate.PFV   ginger.bread.cookie
      'Masha ate (and finished eating) a/(all) the (whole) cookie.'
      Adapted from: Filip (2017: 169)

Interestingly, we can find a similar pattern in the non-Slavic language Hindi if we use the so-called perfective complex verb form (CV):

(95) # maya-ne biskuT-ko khaa-li-yaa, par us-e puuraa
Maya-ERG cookie-ACC eat-take-PFV but it-ACC full
nahiin khaa-yaa.
not eat-PFV
'Maya ate a/the cookie, but not completely.'
Adapted from: Arunachalam & Kothari (2011: 28)

However, the inference turns into cancellable implicature if the so-called simple perfective verb is used (SV), cf. Singh (1998).[10] According to Arunachalam & Kothari (2011: 27), the default interpretation of SV is that an event it refers to comes to full completion. The cancellation of this inference does not lead to a contradiction though, as (96) illustrates.

(96) maya-ne biskuT-ko khaa-yaa, par us-e puuraa
Maya-ERG cookie-ACC eat-PFV but it-ACC full
nahiin khaa-yaa.
not eat-PFV
'Maya ate a/the cookie, but not completely.'
Adapted from: Arunachalam & Kothari (2011: 27)

We can conclude that aspect has an influence on the interpretation of accusative objects across Slavic languages in general, and that there is evidence for the existence of this phenomenon in non-Slavic languages too. The fact that aspect is a grammatical category in Slavic languages results in the extension of its area of activity to non-verbal domains and / or in its insertion to fill possible gaps in the language system (like the lack of overt articles in Polish and Czech).

Crucially, Krifka (1989a), Krifka (1989b), Krifka (1992) and Filip (2005) among others point out that the correlation between the perfective aspect of a matrix verb and the interpretation of a direct object as definite / as a single (atomic) whole is not a 1:1 relationship however; the definiteness / specificity requirement on the object is triggered

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[10] There are several languages where the perfective aspect seems not to entail the completion of verbal events that are under its scope, cf. Ikegami (1985) for Japanese, Singh (1998) amongst others for Hindi, Travis (2000) for Malagasy, Pederson (2008) for Tamil, or Koenig & Muansuwan (2000) for Thai. However, one needs to distinguish between perfectivity and telicity when analyzing cases of perfective non-complete events. It is a common observation for Slavic languages that a perfective verb can be atelic when derived by means of delimitative prefixes. The two perfective forms in Hindi may also represent the (a-)telic variants of the perfective. Since this dissertation deals with Polish (and to some extent with other Slavic languages too), I will not discuss this issue in greater detail. The account proposed in this paper applies to cases where every perfective verb has its imperfective twin; in other words, where the meaning of the perfective is based on the meaning of the imperfective (independently of morphological formation patterns).

not only by aspect, but also by the properties of the argument and by verb semantics. Consider the following examples, adapted from Filip (2005: 128):

(97)   On   zjadł   dwie   oliwki / gruszkę.
            he   ate.PFV   two   olives / pear
            'He ate (up) two whole olives / a/the whole pear.'

(98)   Jan   przyniósł   kaszę   / oliwki.
            Jan   brought.PFV porridge   / olives
            'Jan brought (some/the) porridge / olives.'

(97) illustrates that bare singular count nouns ('pear') and quantified DPs ('two olives') do not necessarily need to have a specific referent when they occur under the scope of perfective verb, but the totality condition cannot be omitted; (97) entails that two whole olives / one whole pear have been eaten up. Therefore, in (97), the object is fully affected by the verbal process on the one hand (there is nothing left from the two olives / the pear), but it does not have a specific referent on the other.

A crucial point is demonstrated in (98). Filip (2005: 128) emphasizes that it is actually the verb semantics, and especially the role of the thematic relation between a verb and its object, in combination with perfectivity, which triggers a definite / specific interpretation of the object (or which influences the object's interpretation in any way possible). For instance, whereas the extent of an eaten object directly corresponds to the progress of an event of eating (and vice versa) in (89), the extent of a moved object does not define the progress of an event of bringing {something} / does not restrict the completion of an event of moving an object towards a goal in (98). According to Filip (2005), the completion of an event of moving in (98) results from Jan's complete path-covering (Jan has necessarily covered the whole implicit path).[11] This, again, suggests that the totality condition must be met in order to receive a definite referential interpretation of bare nominal arguments in Slavic languages. As was demonstrated in (97), this is not, however, a sufficient condition. In (97), a bare singular count argument is interpreted as indefinite, in spite of the perfective aspect marking on a verb.

In the following, I will present Krifka's implementation of the influence of aspect on the interpretation of nominal arguments.

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[11] However, in Finnish, the accusative marking on the object of a transitive verb of motion, in contrast to the partitive marking, implies that the object has reached its destination. From the two alternatives: *Risto vieritti tynnyriä*.PAR / *tynnyrin*.ACC *talolle* 'Risto rolled a barrel to the house', only the partitive variant can be continued by *but the barrel has never reached its destination*. This means that, cross-linguistically, the object of a motion event might participate in or even determine the dimension of a (complete) path-covering. I would like to thank Luka Szucsich for pointing this out.

4.2 Theoretic implementation by Krifka

4.2.1 Nominal reference

The well-known assumptions about the analogies between the meanings of nominal and verbal expressions constitute the starting point for Krifka's theory of aspect. It has been observed that the mass-count distinction in the nominal domain might correspond to the atelic-telic distinction at the verbal level (Leisi 1953, Taylor 1977, Bach 1986). Krifka (1989a), Krifka (1989b), Krifka (1989c) and Krifka (1992) describe these dependencies in greater detail. Therefore, in what follows, I will concentrate on his account.

I will begin with some terminological clarifications. Krifka (1989a: 75) points out that it is not exactly the mass-count distinction (the distinction between mass nouns like *water / wine / porridge* on the one hand and count nouns like *book / pen / apple* on the other) that matters for establishing different types of nominal reference. Instead, we should consider pairs like *water* vs. *an apple*, *apples* vs. *six apples* or *coffee* vs. *a cup of coffee*. The first member of each pair has **cumulative reference** (cf. Quine 1960); a predicate can be applied to both a single entity and to the sum of single entities. For example, if we have a predicate *coffee* and three entities it can be applied to, we can apply this predicate not only to each single entity, but also to their collection (*coffee*, *coffee* and *coffee* can still be described as *coffee*). The second member of each pair has **quantized reference**. For instance, a predicate *a book* only applies to single entities; it cannot refer to the collection of *a book* + *a book*, because the sum of *a book* and *a book* is two books.

In order to formally capture the difference between quantized and cumulative reference, Krifka (1989a), Krifka (1992) uses a model of lattices and measure functions based on Link (1983). If our representation language contains a certain predicate *S* that characterizes individuals of a particular sort (for instance objects in contrast to events), then the extension of *S* should be a complete join semi-lattice without a bottom element. We can define this structure by means of some additional symbols in the representation language *S*. According Krifka, we need a two-place join operation: $\cup_s$, and a two-place part: $\subseteq_s$, proper part: $\subset_s$ and overlap relation: $\circ_s$. Following assumptions are necessary in order to obtain valid interpretations (Krifka 1989a: 77):

(99) $\forall x \forall y [S(x) \wedge S(y) \rightarrow \exists z[x \cup_s y = z]]$ completeness

(100) $\forall x \forall y [x \cup_s y = y \cup_s x]$ commutativity

(101) $\forall x \forall y [x \cup_s x = x]$ idempotency

(102) $\forall x \forall y \forall z [x \cup_s [y \cup_s z] = [x \cup_s y] \cup_s z]$ associativity

(103) $\forall x \forall y[x \subseteq_s y \leftrightarrow x \cup_s y = y]$ part

(104) $\neg \exists x \forall y[x \subseteq_s y]$ no bottom element

(105) $\forall x \forall y[x \subset_s y \leftrightarrow x \subseteq_s y \wedge \neg x = y]$ proper part

(106) $\forall x \forall y[x \circ_s y \leftrightarrow \exists z[z \subseteq_s x \wedge z \subseteq_s y]]$ overlap

(107) $\forall x \forall y[x \subset_s y \rightarrow \exists x'[\neg x \circ_s x' \wedge x \cup_s x' = y]$ relative complementarity

We obtain the following representations for the different reference types (Krifka 1989a: 78).

(108) $\forall P[\text{SNG}(P) \leftrightarrow \exists x[P(x) \wedge \forall y[P(y) \rightarrow x = y]]]$
       P has singular reference

(108) expresses definiteness; a predicate with a singular reference applies to exactly one entity.

(109) **$\forall P[\text{CUM}_s(P) \leftrightarrow \forall x \forall y[P(x) \wedge P(y) \rightarrow P(x \cup_s y)]]$**
       P has cumulative reference

A predicate has cumulative reference if it can be applied not only to single entities but also to the sum of them.

(110) **$\forall P[\text{QUA}_s(P) \leftrightarrow \forall x \forall y[P(x) \wedge P(y) \rightarrow \neg y \subset_s x]]$**
       P has quantized reference

Quantized reference as illustrated in (110) means that if we apply a predicate to two entities x and y, then y cannot be a proper part of x. In other words, if an entity x is in the extension of a quantized predicate, this extension does not contain y that is a proper part of x.

The most important notions are those of cumulative and quantized reference. The characteristics of the two reference types can be summarized as follows. If an extension of a cumulative predicate contains two entities x and y, then it also contains an entity $x \sqcup y$. In contrast, if an extension of a quantized predicate contains an entity x, it does not contain y that is a proper part of x ($\neg y \subset_s x$).

The question arises as to how quantized predicates can be derived from mass nouns; in particular, how one derives the meaning of *a glass of water* on the basis of the meaning of *water*. Krifka (1989a) proposes a derivation by means of the so-called **measure construction**.

Following Krifka (1989a: 81), mass nouns like *water, gold, porridge* carry a basic syntactic category *N*. They should clearly be analyzed as cumulative predicates. However, *one glass of water, five ounces of gold, ten grams of porridge* are quantized predicates; for instance, the sum of two entities *ten grams of porridge* is twenty grams of porridge. Therefore, we cannot apply the predicate *ten grams of porridge* to the collection of more than one entity.

Krifka treats expressions like *one glass, five ounces, ten grams* as measure phrases that are operators on the mass nouns. The semantics of measure phrases is established on the basis of a numeral (*one, five, ten*) and a **measure function** (cf. Cartwright 1975) that is represented by a measure term (*glass, ounces, grams*). The basic syntactic category of numerals is *NM*. An analysis of a measure construction *five ounces of gold* is presented in (111), cf. Krifka (1989a: 83).

(111) *ounces*[N/N,NM] $\lambda n\lambda P\lambda x[P(x) \wedge oz'(x) = n \wedge$
                                    $\text{QMOD}^{12}(P,\lambda P\lambda x[P(x) \wedge oz'(x) = n])]$
        five [NM]   5

      five ounces[N/N] $\lambda P\lambda x[P(x) \wedge oz'(x) = 5 \wedge$
                                    $\text{QMOD}(P,\lambda P\lambda x[P(x) \wedge oz'(x) = 5])]$
        gold [N]   gold'

      five ounces (of) $\lambda x[gold'(x) \wedge oz'(x) = 5 \wedge$
      gold [N] $\text{QMOD}(gold',\lambda P\lambda x[P(x) \wedge oz'(x) = 5])]$

QMOD is a relation called **quantizing modification**. It holds between a predicate and a predicate modifier; modifier *P* turns a cumulative predicate P into a quantized predicate *P*(P). The formal definition of quantizing modification is given in (112), cf. Krifka (1989a: 82).

(112) $\forall P\forall P[\text{QMOD}_s(P,P) \leftrightarrow \neg\text{QUA}(P) \wedge \text{QUA}(P(P))]$

Example (111) shows how quantizing modification changes the reference type of an expression that contains a cumulative mass noun; *ounce* is translated by an extensive measure function that gives the modifier $\lambda P\lambda x[P(x) \wedge oz'(x) = 5]$ a quantized interpretation (cf. Krifka 1989a: 83).

In this subsection, I have discussed cumulativity and quantization as defining criteria for the two types of nominal reference. In the following, I will demonstrate how these two properties interact with complex verbal expressions. It will be shown that, in aspectless languages like English or German, nominal reference of a direct object translates to the

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[12] A lattice-structured sort of object.

entire event description; quantized nominal reference tends to enforce telicity, whereas cumulative nominal reference triggers an atelic event description.

4.2.2 The influence of nominal reference on the interpretation of complex verbal expressions in languages that lack the grammatical category of aspect

As was mentioned above, a verbal expression is atelic if it does not imply a natural end point, such as in the case of German and English *laufen / run* or *Äpfel essen / eat apples*. In contrast, a verbal expression is telic if it implies a natural end point, which applies to phrases like *zwei Kilometer laufen / run two kilometers* or *zwei Äpfel essen / eat two apples*. The activities mentioned in the latter case cannot be carried on for an unlimited amount of time; they terminate at some point and can be taken up again. The crucial point is that, in phrases that contain direct object arguments, the time constitution of an entire expression changes depending on the nominal reference of the object. This is a clear argument in favor of analyzing atelic and telic verbal predicates analogously to the cumulative and quantized interpretation of nominal predicates, respectively. For example, if we have two events that, separately, can be referred to as *laufen / run* or *Äpfel essen / eat apples*, then their collection can also be referred to as *laufen / run* or *Äpfel essen / eat apples* (*run* plus *run* is *run*, *eat apples* plus *eat apples* can still be described as *eat apples*). Furthermore, the proper part of an event of running / eating apples falls under *run / eat apples*. In contrast, in the case of two single events of *zwei Kilometer laufen / run two kilometers* or *zwei Äpfel essen / eat two apples*, the respective predicates can only apply to single events; *run two kilometers* plus *run two kilometers* comes to *run four kilometers*, and *eat two apples* plus *eat two apples* amounts to *eat four apples*. Furthermore, the proper part of *run two kilometers / eat two apples* does not fall under *run two kilometers / eat two apples*. Due to the above-mentioned similarities to the two subtypes of nominal reference, I will call **telic** verbal predicates **quantized** and **atelic** verbal predicates **cumulative**, cf. Krifka (1989a), Krifka (1989b), Krifka (1989c), Krifka (1992).

Following Krifka (1989c: 236), the notion of a natural endpoint that is a defining criterion for telicity can be reconstructed by means of cumulativity and quantization. First of all, a definition of a natural endpoint should not be applied to single events, but to the way they are described. If we look at a particular running, drinking or eating event, it always has a starting and an end point. However, consider an event *e* that can be described as *drink*. Its atelic / cumulative character results from the observation that there are events *e'* that last longer than *e*, that contain *e* as their proper part, and that can still be described as *drink*. In contrast, if the same event *e* is described as *drink a glass of cola*, its telic / quantized property results from the fact that there are no events *e'* that last longer than *e*, that contain *e* as their proper part, and that can still be referred to as *drink a glass of cola*.

To sum up, *drink* is cumulative, because there is no direct object argument that could restrict the temporal duration of an event. *Drink water* is also cumulative, because *water* is cumulative, and, as a result, it does not change the event-structural properties of the entire predicate. In contrast, *drink a glass of water* is quantized, because *a glass of water* is quantized, and, as a consequence, this modifies the temporal constitution of the complex predicate.

Verkuyl (1972) and Platzack (1979) capture the influence of nominal complements on the time constitution of verbal phrases by means of transferring the so-called specified quantity. They provide good descriptions of the above-mentioned phenomena, but no explanations (cf. also Hoepelman 1976, Dowty 1979, Hoepelman & Rohrer 1980, ter Meulen 1984, Hinrichs 1985, Bach 1986, Dowty 1987 or Verkuyl 1988). In contrast, Krifka's theory based on part structures of objects and events explains the nature of transferring nominal reference to verbal predicates.

In order to apply the notions of cumulative and quantized reference to verbs, one can start by defining the meaning of the latter within the framework of **event semantics** (Davidson 1967, Parsons 1980, Carlson 1984). Krifka (1989a: 88) represents syntactic relations between a verb and its arguments and modifiers via primitive thematic relations (cf. also Castañeda 1967).

In the framework of event semantics, verbs are predicates over events. For instance, *drink* applies to drinking events, *eat* to eating events, *smile* to smiling events etc. Consider (113) for the representation of *eat* (adapted from Krifka 1989c: 238).

(113) $\lambda e\, \mathbf{eat}(e)$

The verb's arguments are combined with these events via two-place relations that correspond to thematic roles like agent or patient. Consider the representation of *(to) eat two bananas* (adapted from ibid.); PAT = patient.

(114) $\lambda e \exists x [\mathbf{eat}(e) \wedge \mathbf{two\text{-}bananas}(x) \wedge \mathrm{PAT}(e,x)]$

Further participants can be attached to the verbal stem in the same way as example (115) – *Anna is eating two bananas* – illustrates (adapted from Krifka 1989c: 239); AG = agent; tense is omitted.

(115) $\lambda e \exists x [\mathbf{eat}(e) \wedge \mathrm{AG}(e,\text{Anna}) \wedge \mathbf{two\text{-}bananas}(x) \wedge \mathrm{PAT}(e,x)]$

Finally, an affirmative mode is derived by replacing the lambda operator with an existential quantifier, as in (116), adapted from ibid.

(116) $\exists e \exists x [\mathbf{eat}(e) \wedge \mathrm{AG}(e,\text{Anna}) \wedge \mathbf{two\text{-}bananas}(x) \wedge \mathrm{PAT}(e,x)]$

(117) illustrates the semantic structure of *eat porridge*, adapted from Krifka (1989a: 88).

(117) *eat* [V/NP$_s$,NP$_o$] $\lambda e[eat(e) \wedge$ AG$(e,x_s) \wedge$ PAT$(e,x_o)]$

            porridge [N]   *porridge'*

                INDEF [NP$_o$/N] $\lambda Q \lambda P \lambda e \exists x_o[P(e) \wedge Q(x_o)]$

            porridge [NP$_o$] $\lambda P \lambda e \exists x_o[P(e) \wedge$ porridge'$(x_o)]$

        eat porridge [V/NP$_s$] $\lambda e \exists x_o[eat'(e) \wedge$ AG$(e,x_s) \wedge$ PAT$(e,x_o) \wedge$ porridge'$(x_o)]$
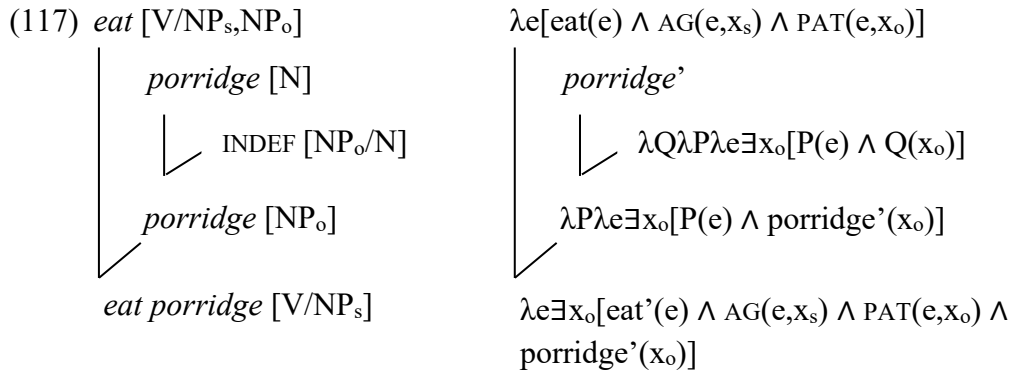
Starting with the syntactic tree on the left, one can see that verbal predicates have a particular set of complements that fulfill specific syntactic functions, like subject or object. The specification of a function is marked with a suffix (here, "$_s$" for subject and "$_o$" for object). As example (117) demonstrates, an indefinite determiner does not have to be expressed overtly.

In the semantic counterpart on the right, verbs are defined as one-place predicates of events. As was explained above, syntactic arguments are combined with events via two-place relations (AG and PAT in the above example), but they do not occur in the immediate semantic representation of a verbal stem (as in 'drink'), cf. also Castañeda (1967), Carlson (1984) among others. Theta roles of syntactic arguments are established as part of their lexical entries.

Now I will discuss the nature of events. Following Krifka (1989a: 90), events are represented by individuals and described by means of a predicate *E* that should be disjoined from *O*. Analogous to *O*, *E* has the form of a join semi-lattice without a bottom element. The distinction between telic (quantized) and atelic (cumulative) predicates can be captured via **mapping from events to times** (Krifka 1989a: 91). Under the assumption that every event *e* has its terminal time point (the final atomic point of the time of its duration), as already outlined above, we do not differentiate between telic and atelic events, but between telic and atelic event descriptions. An event *e* of the type φ is expected to have a terminal point *t* relative to φ iff *t* is the final temporal point of *e* and if there are no *e'* of type φ with either e'$\subset_E$e or e$\subset_E$e' that have an earlier or a later final temporal point. Otherwise, *e* does not have a terminal point. To sum up, **the terminal point of** is a two-place function. It takes both an event *e* and an event predicate φ. This means that a terminal point is a terminal point for an event under a particular description. For instance, if *t* is a terminal point of an event *e* described as *run three kilometers*, it cannot be a terminal point of *e* under the description *run four kilometers*.

4.2.3 The role of thematic relations in triggering the reference transfer: The notion of an incremental patient applied to both nominal and propositional complements

4.2.3.1 The case of nominal complements

The crucial point is that the features of nominal reference of syntactic arguments affect the entire complex predicate iff an argument bears a certain thematic role. The transfer of a reference type can be visualized with a **space-time diagram**, where one axis represents space and the other time. Objects are represented via bands (rather than lines), because we need to take their spatial extensions into consideration. Events are mapped to the time axis. Example (118), adapted from Krifka (1989a: 91), illustrates an interaction between the progress of an event e that is an event of drinking a quantity of juice j, and the gradual disappearance of j in the course of drinking.

(118)
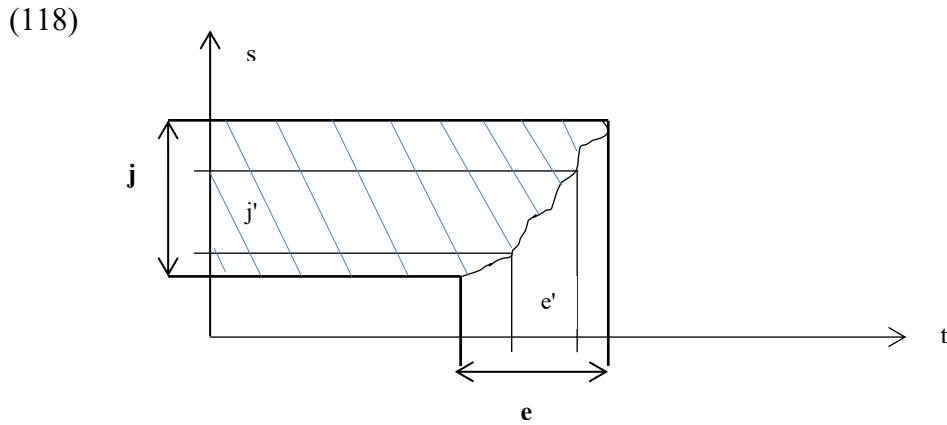
(118) shows that the object can be subjected to the event in a gradual manner. For instance, consider two different descriptions of a situation that relates to drinking juice. First, let e represent *drink juice* and j *juice*. *Juice* is cumulative, which means that it can be applied to its proper part j'. As a result, a predicate *drink juice* is also cumulative and applicable to its proper part e'. Second, j could be described as *a glass of juice*, and the entire predicate e as *drink a glass of juice*. In this case, however, no proper part of *a glass of juice* can be described with *a glass of juice*, and, consequently, no proper part of *drink a glass of juice* with *drink a glass of juice*.

The transfer of properties of thematic relations can be formalized based on the **homomorphism from objects to events**. The following relations can hold between events and objects (Krifka 1989a: 92):

(119) $\forall R[\text{SUM}(R) \leftrightarrow \forall e\forall e'\forall x\forall x'[R(e,x) \land R(e',x') \rightarrow R(e\cup_E e',x\cup_O x')]]$
Summativity

(120) $\forall R[\text{UNI-O}(R) \leftrightarrow \forall e\forall x\forall x'[R(e,x) \land R(e,x') \rightarrow x = x']]$
Uniqueness of objects

(121) $\forall R[\text{UNI-E}(R) \leftrightarrow \forall e \forall e' \forall x[R(e,x) \wedge R(e',x) \rightarrow e = e']]$
Uniqueness of events

(122) $\forall R[\text{MAP-O}(R) \leftrightarrow \forall e \forall e' \forall x[R(e,x) \wedge e' \sqsubseteq_E e \rightarrow \exists x'[x' \sqsubseteq_O x \wedge R(e',x')]]]$
Mapping to objects

(123) $\forall R[\text{MAP-E}(R) \leftrightarrow \forall e \forall x \forall x'[R(e,x) \wedge x' \sqsubseteq_O x \rightarrow \exists e'[e' \sqsubseteq_E e \wedge R(e',x')]]]$
Mapping to events

The basic interaction between thematic relations and the join operation is characterized by summativity (cumulativity for two-place relations), cf. (119). According to Krifka (1992: 43), summativity is the most general property, which holds for all patient relations and possibly for all thematic relations in general. In brief, it says that there are no restrictions on the size of the entities that are connected to each other via theta roles (but this still means that each theta role can be saturated only once). Summativity is an intuitive notion; for instance, if there are two distinct events of eating two apples, they can be merged into an event of eating four apples (see also the derivation of cumulative readings in Scha 1981).

Under the assumption that summativity applies to the experiencer and the stimulus relation (and not only to patient relations), it can capture the meaning of sentences like *Ania and Maciek admired eight dogs*. We can consider the scenario where Ania admired five dogs, Maciek admired three dogs, and the two sets of dogs did not overlap. For the count noun relation, we need an extensive measure function that is consistent with the object lattice. See (124), which is a representation of the above sentence, adapted from Krifka (1992: 43).

(124) $\text{admire}(e_1) \wedge \text{EXP}(e_1,\text{Ania}) \wedge \text{STI}(e_1,x_1) \wedge \text{dog}(x_1,5)$
$\text{admire}(e_2) \wedge \text{EXP}(e_2,\text{Maciek}) \wedge \text{STI}(e_2,x_2) \wedge \text{dog}(x_2,3)$
$\underline{\neg[x_1 \circ x_2]}$
$\text{admire}(e_1 \cup e_2) \wedge \text{EXP}(e_1 \cup e_2,\text{Ania} \cup \text{Maciek}) \wedge \text{STI}(e_1 \cup e_2,x_1 \cup x_2) \wedge$
$\text{dog}(x_1 \cup x_2,8)$

Uniqueness of objects relates an event to at most one object, cf. (120). This property applies for example to an event *eating an apple*; here, the eating event is connected to the particular apple as its patient and to nothing else (in a simplified way, there is exactly one apple that a particular event of eating an apple can be associated with).

The relation uniqueness of events, cf. (121), holds iff an object (patient) can be in a thematic relation to only one event. Taking the example of verbs of consumption, for a specific apple / plate of soup / glass of water, there is only one eating / drinking event available (we cannot have multiple events of eating a particular apple / drinking a particular glass of water).

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Most important for the purpose of this dissertation are the notions mapping to objects and mapping to events, cf. (122) and (123). In the former case, every part of an event correlates with a specific part of an object; hence, every part of an event *eating an apple* relates to the specific part of this apple, giving rise to the gradual disappearance of the apple during eating. In the latter case, the affectedness of an object matches the progress of an event; every part of an apple / soup being eaten / a glass of water being drunk corresponds to the particular part of the event of eating / drinking, i.e. mirrors progress in the realization of that event (Krifka 1989a: 92).

Based on the homomorphism principle, we can define **iterativity**, which is an aspectual non-obligatory component of meaning, belonging to the area of Aktionsarten. Technically speaking, iterativity is a relation between an event *e*, an object *x*, and a thematic relation *R*, which states that at least one part of *x* relates to at least two different parts of *e*. It applies, for instance, to the meaning of the English phrase *(to) read at least one part of the book twice* and its Polish (im)perfective counterparts *(prze)czytać dwa razy co najmniej jedną część książki* (without considering the impact of aspect). See (125), taken from Krifka (1989a: 93).

(125) $\forall e,x,R[\text{ITER}(e,x,R) \leftrightarrow R(e,x) \land \exists e'\exists e''\exists x'[e'\subseteq_E e \land e''\subseteq_E e \land \neg e' = e'' \land x'\subseteq_O x \land R(e',x') \land R(e'',x')]]$

Since iterativity is beyond the scope of this dissertation, I will not discuss it in further detail.

We still need to define the properties that are necessary for thematic relations to allow for the reference transfer from nominal arguments to verbal predicates. Consider (126), where sentences of the type *read a book / bake a cake* are represented by φ, and (127), the exemplification of (126); adapted from Krifka (ibid.).

(126) $\varphi = \lambda e \exists x[\alpha(e) \land \delta(x) \land \theta(e,x)]$

(127)   read-a-book $= \lambda e \exists x[\text{read}(e) \land \text{book}(x,1) \land \textbf{PAT(e,x)}]$

In the above examples, α is a place holder for a verbal predicate, δ for a nominal predicate and θ for a thematic relation (in our case patient).

Now, we can define cumulativity for predicates like *read books, bake cakes*, etc. (Krifka ibid.).

(128) $\forall P \forall Q \forall R[\text{CUM}_O(P) \land \text{CUM}_E(Q) \land \text{SUM}(R) \rightarrow \text{CUM}_E(\lambda e \exists x[P(e) \land Q(x) \land R(e,x)])]$

In brief, (128) states that φ is cumulative if δ is cumulative and θ is summative. The basis for the validity of (128) can be formulated as follows. Consider the situation with e_1 and e_2 (which can be alike), and the corresponding $\varphi(e_1)$, $\varphi(e_2)$. Following the

definition of φ in (126), there must be two objects: x_1, x_2, too. Furthermore, it holds that: $\alpha(e_1)$, $\delta(x_1)$, $\theta(e_1,x_1)$, and: $\alpha(e_2)$, $\delta(x_2)$, $\theta(e_2,x_2)$. Due to the cumulativity of α and δ, we can assume: $\alpha(e_1 \cup_E e_2)$ and $\delta(x_1 \cup_O x_2)$. Finally, because θ is summative, we obtain: $\theta(e_1 \cup_E e_2, x_1 \cup_O x_2)$. As a result, if: $\varphi(e_1 \cup_E e_2)$, then: CUMULATIVE(φ) (Krifka ibid.).

An essential notion introduced by Krifka is **graduality** / **incrementality**. This property of an object (and an entire predicate) plays a crucial role in triggering the interaction between aspect and veridicality in Slavic languages, which is the major topic of this dissertation. Graduality results from the interplay between uniqueness of objects, mapping to objects and mapping to events, cf. (129), taken from Krifka (1989a: 96). Its intuitive meaning was demonstrated via the space-time-diagram in (118).

(129) $\forall R[\text{GRAD}(R) \leftrightarrow \text{UNI-O}(R) \wedge \text{MAP-O}(R) \wedge \text{MAP-E}(R)]$

A nominal object of a transitive verb can bear one of five different semantic roles. Some of these roles implicate a gradual meaning of a complex verbal expression. Four of them are subrealizations of patient; three out of four patient types are gradual patients. Consider (130), adapted from Krifka (1989a: 96).

(130)

example	summativity	graduality	uniqueness of events	label
write a poem	**X**	**X**	**X**	**gradual effected patient**
eat a carrot	**X**	**X**	**X**	**gradual consumed patient**
read a book	**X**	**X**	–	**gradual patient**
stroke a dog	X	–	–	affected patient
admire an orca	X	–	–	stimulus

In the following, the event-structural differences between non-gradual and gradual patients are summarized by means of the space-time diagrams.

(131) Non-gradual simultaneous patient (**Simultan-Patiens**; henceforth, SIM), adapted from Krifka (1989b: 160)
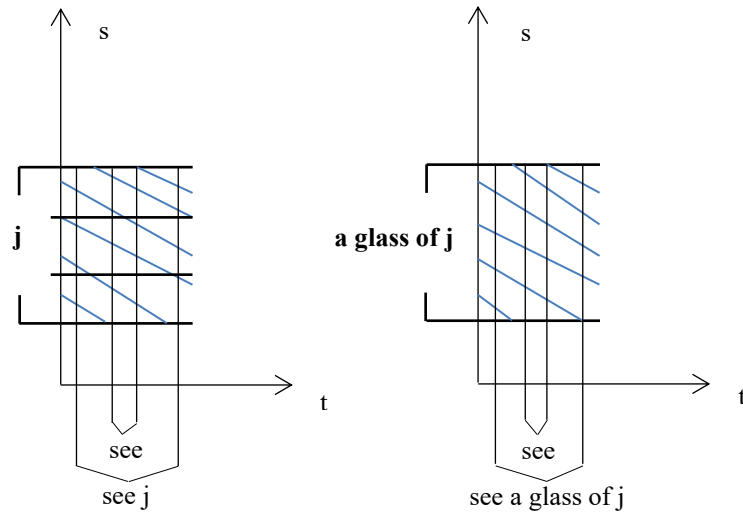
see j   see a glass of j

Example (131) demonstrates the event-structural properties of *see juice (j) / see a glass of juice*, where the entire predicate is cumulative regardless of the nominal reference of a direct object argument. In other words, it is only the cumulativity of *see* that determines the referential properties of the complex construction. The objects *juice / a glass of juice* are not subjected to the event of seeing (something) by degrees and they can be seen as a whole regardless of their underlying reference types. Consider (132) for the semantic representation of 'see juice', adapted from Krifka (1989b: 161).

(132) $= \lambda e \exists x [\text{see}(e) \wedge \text{juice}(x) \wedge \text{SIM}(e,x)]$

Example (133) illustrates the internal structure of verbs that take gradual patients.

(133) Gradual (successive) patient (**Sukzessiv-Patiens**; henceforth, SUK), adapted from Krifka (1989b: 159).

drink j   drink a glass of j

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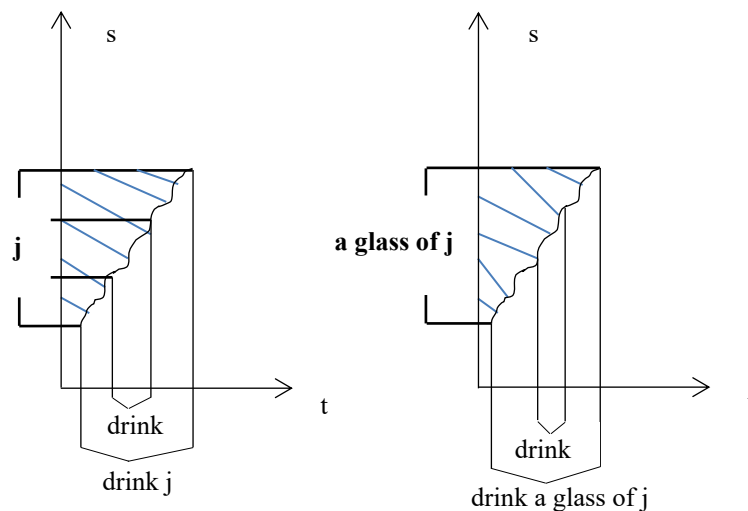
In contrast to verbs of perception exemplified in (131), the nominal reference of complements of verbs of consumption translates to the reference of the entire predicate. The objects of the drinking relation described in (133) are subjected to verbal events in a gradual manner; there is a 1:1 relationship between (sub)objects and (sub)events. In both cases, the object is disappearing in the course of drinking. As was mentioned above, the difference between *juice* and *a glass of juice* in examples like (133) lies in the restriction on part relations: Whereas the horizontal subbands still fall under *juice*, they no longer fall under *a glass of juice*. For this reason, we cannot access single parts in the case of events with quantized reference. The semantic representation of 'drink juice' is illustrated in (134), adapted from Krifka (1989b: 161).

(134) $= \lambda e \exists x [\text{drink}(e) \wedge \text{juice}(x) \wedge \text{SUK}(e,x)]$

Finally, there is a distinction between gradual and gradual effected patient. Consider example (135).

(135) Gradual patient vs. gradual effected patient, adapted from Krifka (1989b: 160).
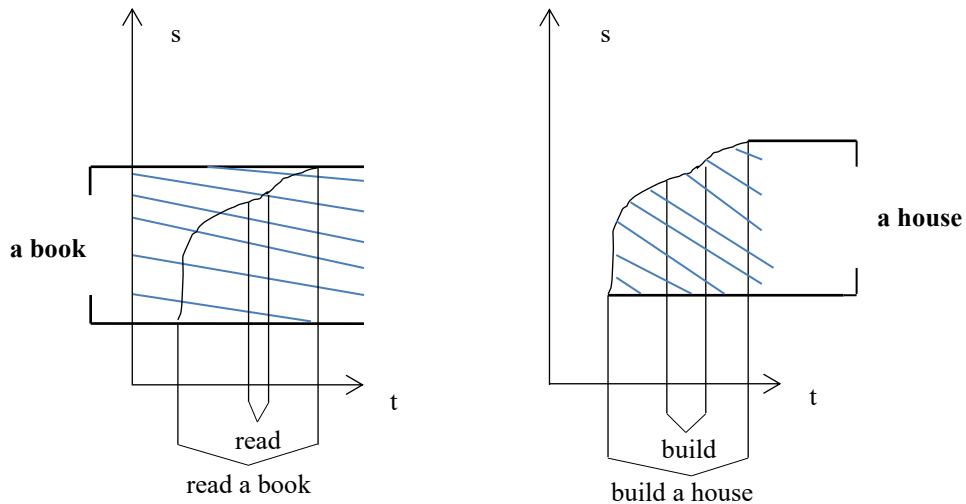
Example (135) visualizes different ways of realizing incrementality. Starting from the left, the object of the relation *read a book* is gradually subjected to the reading event, but it exists independently of the existence of that event; the book exists before, during and after the event of reading happens. The incrementality of *read a book* results from having fewer and fewer pages left in the course of reading. In the case of *build a house*, the object does not exist at all till the beginning of the building event. A house is being created in the course of building, i.e. we have the gradual creation of an object. In (135), both complex verbal expressions are quantized due to the quantized reference of *a book / a house*. If the above situations were described as *read books / build houses*, the

subbands of *books / houses* would still fall under *books / houses*, and, consequently, the subparts of the respective events would still be describable as *read books / build houses*.

In this section, I aimed to show that not every kind of patient implies an incremental relation between an object and a verbal event. In the following, I will propose an analogous classification for clausal patients.

4.2.3.2   The case of propositional complements

Propositional objects can be analyzed analogously to nominal objects as presented in (130). For clausal patients, I propose the scheme in (136). It should be pointed out that it is not the meaning of the object itself that undergoes an incremental change in the case of the clausal arguments investigated in this dissertation. Rather, **graduality / incrementality of transitive verbs with propositional complements** is based on collecting evidence / proving supporting pieces of evidence that, collectively, reveal proposition *p*. Incrementality makes it possible to explain the veridicality-related differences between the perfective and the imperfective reveal-type predicates in Polish (and in many other Slavic and non-Slavic languages, for instance Hungarian). In Polish, the perfective *dowiódł / pokazał / wykazał, że p* '(he) proved / showed / revealed that *p*' denote a complete proving of *p* (the existence of a proof), whereas the imperfective *dowodził / pokazywał / wykazywał, że p* '(he) was proving / showing / revealing that *p*' imply the presence of partial evidence. Crucially, the presence of a proof gives rise to truth-entailment. For that reason, the notion of incrementality that was primarily established for nominal arguments should be extended / redefined for clauses.

(136)

example	summativity	graduality	uniqueness of events	label
prove [that Iza is a thief]	**X**	**X**	–	**gradual revealed patient**
show [that Iza is a thief]	**X**	**X**	–	**gradual revealed patient**
reveal [that Iza is a thief]	**X**	**X**	–	**gradual revealed patient**
guess [that Iza is a thief]	X	–	–	revealed patient
say [that Iza is a thief]	X	–	–	(speech act-based) uttered patient

This requires an explanation of why the objects of verbs of communication, which are accomplishments, are not treated as gradual patients. There is cross-linguistic evidence for the event-structural differences between reveal-type and speech-act verbs. For instance, in Finnish, which distinguishes between accusative and partitive case, transitive incremental theme verbs combine with nouns marked for either the accusative or the partitive, giving rise to quantized and cumulative readings of verbal predicates, respectively (cf. Dahl & Karlsson 1976, Karlsson 1983, Tommola 1990, Filip 2001). In contrast, an informal investigation among Finnish native speakers[13] revealed that verbs of communication, for example *sanoa* 'say', only combine with accusative objects – cf. (137) vs. (138) – which speaks against their incremental character and supports the role of incrementality in triggering truth-entailment. Finnish equivalents of he *proved / showed it best / right* are possible with both accusative and partitive case.

(137) Hamlet   sanoi   sen   kauniimmin.
      Hamlet   said   it.ACC   more.beautifully
      'Hamlet said it best.'

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(138) * Hamlet sanoi sitä kauniimmin.
        Hamlet said it.PAR more.beautifully

The object of *guess* cannot be gradual either, since the verb refers to a punctual event. Importantly, all events described in (136) lack the property **uniqueness of events**. This is due to the fact that, in all cases, the same proposition can be proved / shown / revealed / guessed / said multiple times and within the limits of different episodes (there can be two distinct events e_1 and e_2 which both reveal the same proposition p).

In this subsection, I have proposed the transfer of the notion graduality / incrementality from verbal phrases with nominal to verbal phrases with propositional complements. A more detailed characterization of the mechanism will be given in sections 4.2.4,12.1.2 and 12.2.

In the following, I will introduce two aspect-dependent subtypes of an incremental patient in Polish.

4.2.4   Two subtypes of an incremental patient in the case of the perfective and the imperfective reveal-type verbs in Polish

(139) shows the most relevant properties of propositional objects of (im)perfective reveal-type predicates in Polish.

(139)

example	graduality	partial reveal	complete reveal	label
udowodnić.PFV that *p* 'prove'	X	X	X	completely revealed gradual patient
udowadniać.IPFV that *p* 'prove'	X	X	–	partially revealed gradual patient
dowieść.PFV that *p* 'prove'	X	X	X	completely revealed gradual patient
dowodzić.IPFV that *p* 'prove'	X	X	–	partially revealed gradual patient
pokazać.PFV that *p* 'show'	X	X	X	completely revealed gradual patient
pokazywać.IPFV that *p* 'show'	X	X	–	partially revealed gradual patient
wykazać.PFV that *p* 'reveal'	X	X	X	completely revealed gradual patient
wykazywać.IPFV that *p* 'reveal'	X	X	–	partially revealed gradual patient

Perfective clause-embedding reveal-type predicates are systematically assigned the so-called **completely revealed gradual patient**, whereas their imperfective counterparts bear the **partially revealed gradual patient**. Complete reveal means that there is proof for the proposition expressed by the that-clause. Partial reveal means that evidence available is not sufficient to establish proof. The complete reveal (CR) is established on the basis of partial reveals (PR) (the perfective closes the ongoing process of proving that is expressed by the imperfective). Therefore, it holds that:

(140)   [REVEAL-TYPE(P) ∧ PFV(P) → ∃p[PR(p)⊑CR(p)]]

In contrast, only partial reveals can be attested for the imperfective:

(141)   [REVEAL-TYPE(P) ∧ IPFV(P) → ∃p[PR(p)⋢CR(p)]]

In the following, I will present a reverse case of the transfer of reference type to the one illustrated in section 4.2.2. It will be explained how the grammatical aspect in Slavic languages affects the interpretation of direct object arguments.

4.2.5 The influence of aspect on the interpretation of nominal complements in Slavic languages

According to Wierzbicka (1967), Krifka (1989a), Krifka (1989b), Krifka (1989c), Krifka (1992) among others, the reference transfer from aspectual operators to bare nominals in Slavic languages can result in the correlations **perfective aspect, definite object** on the one hand, and **imperfective aspect, indefinite object** on the other. This is due to the fact that the distinctions in both (im)perfectivity and (in)definiteness interact with distinctions in reference type.

The (in)definite interpretations of bare nominals in Slavic languages can be disambiguated through their semantic representations. Consider (142) for Czech, adapted from Krifka (1992: 49).

(142)	víno	i.	$\lambda x[\text{wine}(x)]$
		ii.	$\lambda x[x = \text{FU}(\text{wine}) \wedge \text{wine}(x)]$
	hruška	i.	$\lambda x[\text{pear}(x,1)]$
		ii.	$\lambda x[x = \text{FU}(\lambda x[\text{pear}(x,1)]) \wedge \text{pear}(x,1)]$
	hrušky	i.	$\lambda x[\text{pear}(x)]$
		ii.	$\lambda x[x = \text{FU}(\text{pears}) \wedge \text{pears}(x)]$

Definite noun phrases (the 'ii.' variants) are represented as predicates that apply to the fusion FU of all elements of a predicate, provided that the predicate itself is applicable to the fusion. For instance, *the wine* applies to the fusion of the whole (contextually given) quantity of wine. Since *wine* is cumulative, 'the whole quantity of wine' is also a quantity of *wine*. By analogy, *the pears* refer to the whole quantity of pears (to the fusion of all pears). In contrast, *the pear* matches exactly one pear. If there is more than one pear, however, the fusion of the single objects each falling under *(a) pear* would not fall under *(a) pear* anymore. This means that, whereas *hruška* (and its Polish counterpart *gruszka*) are quantized independently of their interpretation, the (in)definite readings of *víno* (Polish *wino*) and *hrušky* (Polish *gruszki*) show different referential properties; their definite interpretation, which results in singular reference, implies quantization, and their indefinite interpretation implies cumulativity (Krifka ibid.).

In section 4.1, I assumed that perfectivity triggers definiteness and imperfectivity indefiniteness. However, Krifka (1992: 50) points out that a verb marked for the perfective aspect allows for an indefinite object, provided that this object is quantized. Consider (143), adapted from Krifka (1992: 49). Therefore, Krifka suggests that it is quantization and not definiteness that is enforced by perfectivity.

(143) Czech: Snědl   hrušku.
                  ate.**PFV**   pear
                  'He ate **a pear/the pear**.'
       Polish: Zjadł   gruszkę.
                  ate.**PFV**   pear
                  'He ate **a pear/the pear**.'
       Russian: On   s'jel   grushu.
                  he   ate.**PFV**   pear
                  'He ate **a pear/the pear**.'

Krifka assumes that perfective aspect presupposes quantization of an entire verbal predicate. The fundamental role of the perfective lies in marking completion of a verbal event. However, we can only talk about completion if events in the extension of a verbal predicate are not such that their proper parts are in this extension too. In that sense, completion translates to a quantization restriction.

(144) PFV(P) presupposes: P is quantized (Krifka 1989c: 252).

In contrast, the imperfective aspect blocks quantization.

(145) IPFV(P) presupposes: P is not quantized (Krifka ibid.).

Under the assumption that the scope of aspectual operators covers the complex verbal expression (both the verb and its object), we receive two types of interpretations of predicates, depending on aspect, cf. (146) and (147), adapted from Krifka (1989c: 252). The crucial part of the definition is the restriction on thematic relation TH-REL.

(146) PFV(λe$\exists$x[VERB(e) $\wedge$ NOUN(x) $\wedge$ TH-REL(e,x)])

(147) IPFV(λe$\exists$x[VERB(e) $\wedge$ NOUN(x) $\wedge$ TH-REL(e,x)])

Krifka (1989b: 187) proposes following semantic representations for a definite quantized (148) and an indefinite cumulative (149) interpretation of bare nouns like *vino* (Czech) / *wino* (Polish) 'wine' in constructions of the type 'PFV-drink wine' vs. 'drink.IPFV wine'.[14]

(148) λx[x=MAX(Wein)]

(149) λx[Wein(x)]

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[14] For possible refinements see the mereotopological notion of border proposed by Grimm (2012).

According to (146) and (147), the features [± perfective] are being passed on within an entire construction. Their function is to control for (a)telicity. Two rules are necessary in order to describe this transfer. First, if two expressions λ and β build a well-formed unit λβ, and if λ bears a feature m, then λβ also bears a feature m. Second, if λ is a sentence radical (a state of affairs; a verbal predicate with no unsaturated argument positions, cf. Lewis 1972) with the feature [+ perfective], it can only be semantically well-formed if it denotes a quantized expression. The feature [+ perfective] can be deleted after the completion of the proving process. In contrast, if λ is a sentence radical with the feature [+ imperfective], it can only be semantically well-formed if it denotes a cumulative expression. The feature [+ imperfective] can be deleted after the completion of the proving process. Consider example (150) (adapted from Krifka 1989b: 187), where the Polish perfective incremental theme verb *zjeść* 'to eat' incorrectly combines with an indefinite/cumulative reading of an object.

(150)   Marek zjadł kaszę.[][PFV] 'Marek ate porridge.'
$\#\lambda e \exists x[eat(e) \wedge porridge(x) \wedge SUK(e,x) \wedge AG(e,m)]$

Since the verb in (150) is marked for the perfective aspect, the entire predicate must denote a quantized expression. However (and as expected), the exact opposite holds for the above structure. Let's consider e_1 and x_1 in the following constellation: $eat(e_1) \wedge porridge(x_1) \wedge SUK(e_1,x_1) \wedge AG(e_1,m)$. Due to the divisibility of 'porridge' in its above representation, we can assume: $x_2 \subset x_1$, with $porridge(x_2)$. Due to the divisibility of 'eat' and the definition of the SUK-relation[15], we can assume: $e_2 \subset e_1$, with $eat(e_2)$ and $SUK(e_2,x_2)$. Finally, it is plausible to assume: $AG(e_2,m)$. As a result, both e_1 and e_2 with $e_2 \subset e_1$ are in the extension of the verbal predicate, which provides an incorrect interpretation of the sentence 'Marek zjadł.PFV kaszę.' In order to derive its suitable reading, a definite interpretation of the object needs to be used, as illustrated in (151).

(151)   Marek zjadł kaszę.[][PFV] 'Marek ate porridge.'
$\lambda e \exists x[eat(e) \wedge x=MAX^{16} (porridge) \wedge SUK(e,x) \wedge AG(e,m)]$

Krifka's account works well for cases where there is a 1:1 relationship between perfectivity and telicity (or between perfectivity and quantization) and where the object argument is realized as an incremental theme. See Filip (2001) for the model's extension.

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[15] $SUK(e,x) \wedge x' \subset x \rightarrow \exists e'[e' \subset e \wedge SUK(e,'x')]$ and

$SUK(e,x) \wedge e' \subset e \rightarrow \exists x'[x' \subset x \wedge SUK(e,'x')]$, adapted from Krifka (1989b: 161).

[16] Since there is no x', there cannot be an e' either, so that only the complete event can be in the extension of the verbal predicate.

In the following, I will discuss (non)aspectual factors that determine factivity of clause-embedding verbs. The main part of this chapter (and of this dissertation) is the role of perfectivity in triggering factivity.

5 Factive interpretation of clause-embedding predicates

5.1 Non-aspectual factors that enforce a factive interpretation of clause-embedding verbs

5.1.1 Correlates

Hegarty (1992b: 6) observed that the presence of correlates (object expletives) gives rise to discourse-givenness of embedded propositions. Correlates are anaphoric expressions that occur in the matrix sentence, but refer to the object argument expressed by the subordinate clause. Consider example (152), taken from ibid.

> (152)   I was talking to our agents in Russia yesterday,
>   a.   and they noticed that Max went to Moscow last week.
>   b.   and they noticed **it** that Max went to Moscow last week.

Hegarty claims that, in (152), the that-sentences in both a. and b. receive a factive interpretation, but differ with respect to their information-structural status: whereas the proposition expressed by the that-clause in a. counts as new (the hearer is not expected to know about Max's trip to Moscow), the one in b. is established as known / discourse-given (the sentence is odd in a scenario where the hearer does not know about Max's trip to Moscow). However, consider the following examples.

> (153)   They noticed that Max went to Moscow last week.
>   → Max went to Moscow last week.

> (154)   They did not notice that Max went to Moscow last week.
>   ↛ Max went to Moscow last week.

> (155)   They did not notice **it** that Max went to Moscow last week.
>   → Max went to Moscow last week.

It seems that *notice* is veridical rather than factive; (154) could be followed by *Fortunately, our colleagues in France noticed that he went to Paris though, so we are on his trail again*, which shows that the truth-inference from (153) does not survive under negation. Interestingly, (155), which is enriched by the expletive pronoun, presupposes that the complement sentence holds in the actual world. This suggests that correlates might trigger both discourse-givenness and factivity, and, even more importantly, that there is a relationship between these two.[17] Hegarty (1992a: 45) observed such a parallel for *accept, confirm* and *verify*. He noticed that these verbs

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[17] The interaction between discourse-givenness and factivity can be seen as a clausal equivalent to the interaction between perfectivity and definiteness. It also provides another argument for the relationship between definiteness and factivity.

presuppose the truth of their sentential complements when the latter are introduced by correlates, cf. (156) vs. (157), adapted from ibid.

(156)   They don't accept that loneliness causes cancer.
        They didn't confirm that loneliness causes cancer.
        They didn't verify that loneliness causes cancer.
        ↛ Loneliness causes cancer.

(157)   They don't accept **it** that loneliness causes cancer.
        They didn't confirm **it** that loneliness causes cancer.
        They didn't verify **it** that loneliness causes cancer.
        → Loneliness causes cancer.

The influence of correlates on the veridical / factive interpretation of matrix verbs was also attested for German, cf. Sudhoff (2003), Schwabe (2013), Schwabe & Fittler (2014). According to Schwabe (2013), the *es*-correlate in German can, but does not have to trigger factivity. Verbs that become factive when combined with *es* are for instance *hören dass* 'to hear that', *bedauern dass* 'to regret that', *sich freuen dass* 'to be pleased (about) that', and verbs that do not *beweisen dass* 'to prove that' or *erreichen dass* 'to achieve that'.

Furthermore, in Albanian and Greek, clitic pronouns that double a clausal complement trigger factivity of originally non-factive verbs. Compare (158) vs. (159) for Albanian, and (160) vs. (161) for Greek, adapted from Kallulli (2006: 212).

(158)   Besova   se   Beni   shkoi   (por   në   fakt   ai   nuk
        believed-I that   Ben   left   (but   in   fact   he   not
        shkoi).
        left
        'I believed that Ben left (but in fact he didn't).'

(159)   **E**   besova   se   Beni   shkoi   (*por   në   fakt   ai
        itCL,ACC   believed-I that   Ben   left   (but   in   fact   he
        nuk   shkoi).
        not   left
        'I believed the fact that Ben left (*but in fact he didn't).'

(160)   Pistepsa   oti   o   Janis   efije   (ala   stin   pragmatikotita
        believed-I   that   the   Janis   left   (but   in.the   reality
        den   ejine   kati   tetio.
        NEG   happened   something   such

(161) **To**   pistepsa   oti   o   Janis efije   (*ala   stin
       it_{CL,ACC}   believed-I that the   Janis left   (but   in.the
       pragmatikotita   den   ejine   kati   tetio.
       reality   NEG   happened   something   such

However, the correlate-based factivity is mostly context-dependent. Consider example (162), where factivity of *to notice it that* vanishes after providing an appropriate scenario.

(162) Some people have claimed that Max could have gone to Moscow last week, which would have caused serious problems. However, neither of our agents noticed it that Max went to Moscow last week. He probably went to Rome.

It seems plausible to assume that a discourse-given proposition tends to be established as true, i.e. acknowledged by the participants. To put it more precisely, if a proposition is not at-issue, it is not meant to be verified with respect to its truthfulness; it simply functions as a discourse referent that is picked up in the course of the conversation.

The above examples show that discourse-givenness can, but need not go along with factivity. Verb semantics and contextual properties play an important role in this transition too.

Interestingly, in some languages, correlates can only refer to non-factive complement sentences. For instance, the correlate *azt* in Hungarian always appears in the focus position of an embedding verb. As a result, the embedded proposition it relates to cannot be presupposed. This pattern was discovered by Cuba & Ürögdi (2001); see examples (163) and (164), adapted from Cuba & Ürögdi (2010: 44).

(163) Péter   (*azt)   sajnálja,   hogy   havazik.
       Peter   DEM-ACC   regrets   that   snows
       'Peter is sorry that it's snowing.'

(164) Péter   azt   mondta,   (hogy)   havazik.
       Peter   DEM-ACC   said   that   snows
       'Peter said that it's snowing.'

It is worth-mentioning, though, that *azt* is optional with non-factives. Consider (165) and (166), adapted from Cuba & Ürögdi (2010: 44).

(165) János   azt   állította, (hogy) Mari   megnyerte
       János   DEM-ACC   claimed   that   Mari   won
       a   lottót.
       the   lottery-ACC
       'John claimed that Mary won the lottery.'

(166) János   állította,   hogy   Mari   megnyerte   a   lottót.
       János   claimed   that   Mari   won   the   lottery-ACC
       'John claimed that Mary won the lottery.'

According to the authors, both (165) and (166) could be uttered in the following scenario: *All of a sudden, Mary ended up with a lot of money, but nobody knew how* (ibid.). The complement proposition is presupposed neither in (165) nor in (166). However, whereas the information focus is put on the complement sentence in (165), it is put on the matrix verb in (166). At the same time, the authors assume that this information-structural split does not correspond to novelty vs. givenness, which opens the question concerning how information focus is to be understood there (cf. for instance Kiss 1998, who claims that information focus conveys new information).

Cuba & Ürögdi (2010) suggest that the difference between pairs like (165) and (166) lies in the (non)referentiality of the complement, i.e. in the presence or absence of an illocutionary force within a subordinate clause. Since this topic is beyond the scope of my dissertation, I will not discuss it in greater detail.

Regarding (im)perfective clause-embedding verbs in Polish, it seems that perfective rather than imperfective variants occur with correlates. The reason for this might lie in the need for maintaining the 'factivity-balance' of a complex expression; if correlates require that the utterances they correspond to hold in the actual world, they should rather combine with verbs that only embed true propositions. However, depending on the semantic class a matrix verb belongs to, a correlate can fulfill multiple functions; it can signal discourse-givenness of a true proposition (proposition embedded under a factive verb), cf. (167), or discourse-givenness of a neutral proposition (regardless of aspectual marking on a matrix verb), cf. (168). Sometimes a correlate contributes to factivity when combined with an imperfective non-factive verb (especially in the case of imperfective counterparts of perfective presuppositions verbs; these imperfective verbs seem to have both a factive and a non-factive interpretation, see experimental results), cf. (169).

(167) Nawet Ola **tego** nie przeczuła / wyczuła
      even Ola **it.GEN** NEG sensed.PFV / sensed.PFV
      / przewidziała / żałowała, że Marek jest zdrajcą.
      / predicted.PFV / regretted.IPFV that Marek is traitor
      'Even Ola did not sense it / predict it /regret it that Marek is a traitor.'
      → Marek is a traitor.
      → The proposition 'Marek is a traitor' is discourse-given.

(168) Nawet Ola **to** powiedziała / mówiła / ogłosiła
      even Ola **it.ACC** said.PFV / said.IPFV / announced.PFV
      / ogłaszała, że Marek jest zdrajcą.
      / announced.IPFV that Marek is traitor
      'Even Ola said it[18] / was saying it / announced it / was announcing it that Marek is a traitor.'
      ↛ Marek is a traitor.
      → The proposition 'Marek is a traitor' is discourse-given.

(169) Nawet Ola **tego** nie przeczuwała / wyczuwała
      even Ola **it.GEN** NEG sensed.IPFV / sensed.IPFV
      / przewidywała, że Marek jest zdrajcą.
      / predicted.IPFV that Marek is traitor
      'Even Ola was not sensing it / predicting it that Marek is a traitor.'
      → Marek is a traitor.
      → The proposition 'Marek is a traitor' is discourse-given.

To sum it up, it seems that correlates interact with factivity in the sense that discourse-givenness can indicate the establishment of a proposition as true. However, this is only a possible, but not a necessary function of object expletives. Their primary role is to mark any kind of givenness. If a proposition is established as given, it is often not meant to be verified regarding its holding or non-holding, hence it tends to be acknowledged as true. We have seen that, in German, the correlate *es* can, but does not have to enforce a clausal complement of a non-factive verb to be true. It can further be combined with an (inherently) factive verb in order to mark discourse-givenness of an embedded proposition. However, in contrast to English, German or Polish, clitic pronouns in Albanian and Greek make non-factive verbs like 'believe' factive. This reveals a cross-linguistic variation with respect to the relationship between discourse-givenness and factivity. In Polish, the correlate can mark discourse-givenness of a proposition embedded under a factive verb like *przeczuć* 'sense.PFV' or a 'neutral' verb like *powiedzieć* 'say.PFV'. It can finally trigger both factivity of a matrix verb and discourse-givenness of a clausal complement, especially in the case of imperfective twins of presupposition verbs like *przeczuwać* 'sense.IPFV'.

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[18] English native speakers prefer the version without *it*; *announce*, in contrast to *say*, can be followed by *the fact*.

In the next subsection, I will discuss the relationship between prosody and factivity, i.e. the way the former affects the latter.

5.1.2 Prosody

According to Kallulli (2006), deaccenting an embedded sentence can give rise to a factive or veridical interpretation of a non-veridical matrix verb. Consider (170) for English and (171) for German, both adapted from Kallulli (2006: 215). The author claims that *believe* and *glauben* receive a factive interpretation, because they carry a nuclear pitch accent.

(170)   I didn't see John leave my party, but then he called me from his home phone. Now it was obvious. <u>I BELIEVED[19] that John left</u>.

(171)   Ich gab bekannt (die Tatsache), dass Peter verstarb. Zuerst wollte Hans nichts davon wissen. Dann zeigte ich ihm die Todesanzeige, und nun sah er die Sache anders. <u>Er GLAUBTE, dass Peter verstarb</u>.
'I made known (the fact) that Peter died. At first Hans didn't want to hear of it. Then I showed him the death certificate and now he saw the matter differently. He believed that Peter died.'

A similar pattern holds for Polish, as demonstrated by Danielewiczowa (2002) (see also chapter 0 of this dissertation). In a nutshell, some epistemic imperfective non-factive verbs 'become' factive if they carry the primary stress. However, it does not work for *wierzyć* 'believe', but it does, for instance, for *podejrzewać* (see chapter 6.1 for a detailed discussion). Examples (172) and (173) illustrate the contrast in question. If uttered out of the blue, (173), as opposed to (172), presupposes that the complement sentence holds in the actual world.

(172)   Jan podejrzewa, że go zwolnią, ale nie ma racji.
'Jan suspects.IPFV that he will be fired, but he is not right.'
↛ Jan will be fired.

(173)   #Jan PODEJRZEWA, że go zwolnią, ale nie ma racji.
'Jan suspects.IPFV that he will be fired, but he is not right.'
→ Jan will be fired.

As in the case of correlates, the stress-bound factivity can vanish in suitable scenarios (cf. for instance Ishihara & Ürögdi 2011). It seems that deaccenting a that-clause primarily signals its givenness in the discourse, which, in some cases, corresponds to its acknowledgement as true.

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[19] Upper case indicates the nuclear pitch accent.

In the next subsection, I will discuss the role of the type of embedding in triggering factivity.

5.1.3 Embedded questions and the notion of parts of propositions

Following Karttunen (1977: 387), questions denote sets of propositions that express their true answers.[20] Karttunen (ibid.) argues for this definition with the aid of the meaning of question-embedding verbs like *to depend on*. Consider example (174).

(174) Who is elected depends on who is running. (Karttunen 1977: 387)

In (174), the true answer to the question from the subject position depends on the true answer to the question from the object position. The adequate interpretation of *to depend on* can be predicted if one assumes that indirect questions denote sets of propositions that, taken together, reveal a true and complete answer to the question.

Another argument for the assumption that questions denote true propositions is provided by verbs of communication. Karttunen (1977: 387) observed that *tell, indicate*, etc. are non-veridical when combined with a that-clause, cf. (175), but veridical when combined with an indirect question, cf. (176).

(175) John told Mary that Bill and Susan passed the test. (Karttunen 1977: 387)

(176) John told Mary who passed the test. (Karttunen 1977: 387)

(176), in contrast to (175), suggests that John was telling the truth. Under the assumption that the subordinate clause *who passed the test* denotes a set of true propositions, (176) is true iff John told Mary every proposition that is contained in that set.[21] A similar (but slightly weaker) contrast seems to exist in Polish, as illustrated in (177) and (178). Crucially, this contrast arises especially in the case of a direct comparison between the declarative and the interrogative variant, which will become clear later.

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[20] See also the very influential theory of Hamblin (1973) who proposes a denotation of questions based on their possible (not necessarily true) answers. Accordingly, direct wh-questions like *Who ate a banana*? denote the set of propositions expressed by 'Tom ate a banana', 'Marc ate a banana', 'Nicole ate a banana', etc. Direct yes-no questions like *Is it dark outside*? denote a set of contradictory answers 'It is dark outside' and 'It is not dark outside', cf. Karttunen (1977: 387) As will be shown later, Polish and English data speak in favor of the adoption of Hambling's theory of questions.

[21] However, not every wh-clause needs to be interpreted exhaustively. For instance, the sentence *Katie knows where one can get nice English food in Berlin* is already true if Katie knows/lists one or two good English restaurants in Berlin (she does not have to mention all of them); for the (non)exhaustive readings of wh-questions see Groenendijk & Stokhof (1982) among others.

(177) Jan   powiedział   nam   /   poinformował   nas,
Jan   said.PFV   we.DAT   /   informed.PFV   we.ACC
że   Iza   śpi,   ale   się   pomylił.
that   Iza   sleeps   but   REFL   was.wrong
'Jan told us / informed us that Iza was sleeping, but he was wrong.'
↛ Iza was sleeping.

(178) Jan   powiedział   nam   /   poinformował   nas,
Jan   said.PFV   we.DAT   /   informed.PFV   we.ACC
kto   śpi,   # ale   się   pomylił.
who   sleeps   but   REFL   was.wrong
'Jan told us who / informed us about who was sleeping, but he was wrong.'

As mentioned above, perfective communication verbs in Polish do not entail (but at least implicate) that their sentential complements are true. This is shown in (177). However, as (178) demonstrates, if they embed a wh- instead of a that-clause, the answers to the wh-question must denote true propositions, cf. Karttunen (1977), Groenendijk & Stokhof (1982).

Imperfective communication verbs that take a wh-clause seem to be rather neutral with respect to veridicality. Consider example (179).

(179) Jan   mówił   nam   /   ?informował   nas,
Jan   said.IPFV   we.DAT   /   informed.IPFV   we.ACC
kto   śpi,   ale   raczej   zgadywał,   niż   wiedział.
who   sleeps   but   rather   guessed.IPFV   than   knew.IPFV
'Jan told us who / informed us about who was sleeping, but he was rather guessing; he did not actually know this.'

See also (180) where a wh-sentence embedded by imperfective communication verbs can refer to false answers too:

(180) Jan is a horrible liar, so we never believe what he says. Yesterday, *mówił* (*nam*) / *?informował nas, who was coming to the party*. As expected, it turned out that he had made everything up; every single name that he mentioned was wrong.

It is worth mentioning, however, that *informować* is 'more veridical' than *mówić*, which is why its acceptance in contexts like the one above would need to be empirically verified (this is also why a question mark is placed before *informować* in the above example).

Furthermore, it has been observed that accusative objects are most affected by the verbal process compared to other object types. Relating to the above examples, the accusative-marked recipient of 'inform' is more strongly associated with an event than

the dative-marked recipient of 'say' (only the latter can be omitted). Thus, it might be less likely for a proposition embedded under 'inform' not to be acknowledged by the addressee, cf. (181).

(181) Lekarz   mówił   mu$_1$ / ?informował   go$_1$,
       doctor   said.IPFV   he.DAT   / informed.IPFV   he.ACC
       że   jest   chory,   ale on$_1$ nie   chciał   przyjąć   tego   do
       that is   sick   but he   NEG   wanted   take   it.GEN   to
       wiadomości.
       information
       'The doctor kept telling him / kept informing him (about the fact) that he
       was sick, but he did not want to take note of it.'

This, in turn, makes a proposition embedded under 'inform' a good candidate for being interpreted as true, and the embedding verb a good candidate for being (optionally) veridical. In other words, if the speaker has a choice between the stronger 'inform' and the weaker 'say', she would prefer the weaker form unless she takes the truth of a that-clause for granted (cf. Heim 1991 for Maximize Presupposition).

The role of verb semantics in triggering veridicality/factivity in wh-environments is elaborately discussed by Karttunen (1977), Lahiri (2000), Egré (2008) or Spector & Egré (2015).

According to Spector & Egré (2015: 1732), a responsive predicate[22] is veridical regarding its interrogative complement iff it is veridical regarding its declarative complement. For instance, *to know wh-* means that an answer to the wh-question is the true answer to that question. This is so because *to know that* implies that a proposition embedded under *know* holds in the actual world.

Spector & Egré (2015: 1743) assume a unified semantic rule for embedded interrogatives that can be subsumed as follows: For any responsive predicate *P*, a sentence that consists of *X* (an individual-denoting expression), *P* and *Q* (an interrogative clause) is true in a world *w* iff the referent of *X* is in the relation denoted by *V* to some proposition *A* that is a **potential complete answer to Q** (there is a world *w'* in which *A* is the complete answer to *Q* in *w'*), adapted from ibid. The general meaning postulate can be formalized as in (182).

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[22] **Responsive predicate** is a predicate that takes both declarative and interrogative complements, cf. Lahiri (2002). For instance, one can say *Marc knows / remembers that Jack is the winner* and *Marc does not know / remember whether Jack is the winner*. In contrast, one cannot say *Marc investigates / asks #that Jack is the winner* (compared to *Marc is investigating / is asking whether Jack is the winner*). Verbs that belong to the former group are responsive predicates.

(182) $[\![P_{int}]\!]^{w} = \lambda Q. \lambda x. \exists p \in pot(Q) [\![P_{decl}]\!]^{w} (p)(x) = 1$
Adapted from: Spector & Egré (2015: 1744)

(182) predicts that, if a responsive predicate is veridical, then it is veridical with respect to its declarative and interrogative complement. By analogy, if it is non-veridical, it is non-veridical with respect to both a that- and a wh-clause. More precisely, the potential answer to *Q* is its true answer only if the proposition embedded under a declarative *V* holds in the actual world. For instance, the sentences *Eli knows / remembers who stole the car* are interpreted such that there is a potential complete answer to the question *Who stole the car*? that is known / remembered by Eli. This answer must be the true answer since *know* and *remember* are factive verbs. In contrast, in the case of *Michael and Eli agreed on / were certain about who stole the car*, Michael and Eli must have agreed on / have been certain about a potential complete answer to the question *Who stole the car*. Since *agree on* and *be certain about* are neither factive nor veridical, the complete answer Michael and Eli agreed on / were certain about need not be the true answer, though.

Spector & Egré (2015) demonstrate that the previously outlined factivity-based contrast between *tell wh-* and *tell that* (with the former being veridical and the latter non-veridical) is only a tendency and not an obligatory correlation, so that it does not provide a counterexample to their hypothesis. The non-veridical reading of *tell wh-* has already been attested by Tsohatzidis (1993) by means of the validity of the following inferences:

(183)   Old John told us whom he saw in the fog, but it turned out that he was mistaken
(the person he saw was Mr. Smith, not Mr. Brown).

(184)   Old John told us whom he saw in the fog, and it turned out that he was not mistaken
(the person he saw was indeed Mr. Brown).

Tsohatzidis (1993) points out that neither does (183) express a contradiction nor is (184) redundant, which speaks against the inherent veridicality of *tell wh-*.

However, it still follows from (183) that Old John believed that he was right; it seems odd to continue the sentence with *but he lied / did not believe it*. In contrast, the subject could have made the false statement in the case of *tell that*: *Old John told us that he saw Mr. Brown, but he lied* is perfectly fine. These observations suggest that, whereas answers to *tell wh-* do not need to be true answers, it necessarily holds that the speaker believes what she says, but this requirement is absent with *tell that*.

As further evidence of the truth-related neutrality of *tell wh-*, consider (185)–(188), taken from Spector & Egré (2015: 1737).

(185)　Every day, the meteorologists tell the population where it will rain the following day, but they are often wrong.

(186)　# Every day, the meteorologists know where it will rain the following day, but they are often wrong.

(187)　I believe that Jack told you which students passed; but I don't think he got it right.

(188)　I believe that Jack knows which students passed; # but I don't think he got it right.

Spector & Egré (2015: 1737) further show that other communication verbs in English pattern with *tell wh-* in that they are not necessarily veridical / factive with questions:

(189)　Every day, the meteorologists predict/announce whether it will rain the following day, but they are often wrong.

(190)　I know that Jack predicted/announced which students would pass, but I don't think he got it right.

In Polish, there is a similar contrast between most (im)perfective communication verbs, cf. (191), and factive / veridical perfectives, cf. (192).

(191)　Meteorolodzy　　mówili　　　/ powiedzieli,　　gdzie　　będzie padać,
　　　　meteorologists　said.IPFV　 / said.PFV　　　　where　　FUT　 rain
　　　　ale　　się　　pomylili.
　　　　but　 REFL　were.wrong
　　　　'The meteorologists were saying / said where it was gonna rain, but they were wrong.'

(192)　Meteorolodzy　　zgadli　　　　/ przewidzieli　/ wyczuli
　　　　meteorologists　guessed.PFV　/ predicted.PFV　/ sensed.PFV
　　　　/ udowodnili,　gdzie　będzie　padać,
　　　　/ proved.PFV　 where　FUT　　rain
　　　　# ale　　się　　pomylili.
　　　　　 but　 REFL　were.wrong
　　　　'The meteorologists guessed / predicted / sensed / proved where it was gonna rain, but they were wrong.'

As expected (and as a further argument in favor of Spector & Egré 2015's theory), the respective imperfective non-factive counterparts to verbs listed in (192) are compatible with *but they were wrong*.

(193) Meteorolodzy   zgadywali   /   przewidywali   /   ?wyczuwali[23]
meteorologists   guessed.IPFV   /   predicted.IPFV   sensed.IPFV
/ udowadniali,   gdzie   będzie   padać,
/ proved.IPFV   where   FUT   rain
ale   się   pomylili.
but   REFL   were.wrong
'The meteorologists were guessing / predicting / sensing / proving where it was gonna rain, but they were wrong.'

Furthermore, the meaning of inherently factive imperfectives and the respective perfective derivates taking wh-complements corresponds to their meaning with respect to declarative complements. In both cases, there is an obligatory relation to the true proposition / the true answer to the wh-question. Because the imperfective stem is factive, the perfective automatically inherits the factivity-feature. Consider (194).

(194) Żałowałam   /   pożałowałam   tylko   tego,   gdzie
regretted.1SG.IPFV   /   regretted.1SG.PFV   only   it.GEN   where
się   poznaliśmy.
REFL   met
'The only thing I kept regretting / started regretting was where we got to know each other.'
→ There is a place in the actual world where the speaker and the addressee got to know each other in the actual world. The speaker regrets the fact that the get-to-know happened at this particular place and not somewhere else.

Due to the inherent factivity of the imperfective base *żałować*, both the imperfective and the perfective variant embed true propositions when used with a that-clause. For that reason, the wh-sentence can only access true answers to the wh-question.

Crucial for the purpose of this dissertation is the parthood relation for embedded questions that was proposed by Lahiri (2000) and Lahiri (2002) among others. Lahiri (2000) claims that the so-called **quantificational variability effect** in embedded interrogatives involves quantification over parts of answers. Consider the following examples, taken from Lahiri (2000: 329).

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[23] In some environments (depending on the scenario), *wyczuwać* seems to be ambiguous between a factive and a non-factive reading. Since there is a tendency for wh-clauses to denote sets of true propositions, the combination *wyczuwać* + wh-clause might favor the factive interpretation of the former. This, in turn, confirms that there is a correlation between wh-embedding and veridicality / factivity. However, as was shown throughout this chapter, this correlation vanishes if an appropriate context is provided. We can conclude that, in Polish, the meaning of a wh-clause is predictable from the meaning of a that-clause. Out of the blue, a wh-embedding tends to favor a veridical interpretation of a non-veridical verb, especially in the case of perfective communication verbs. This observation requires a solid empirical justification, though, which will be the subject of future research.

(195)   Mary knows, in part, Beethoven's fifth symphony.

(196)   Mary mostly knows Beethoven's fifth symphony.

(197)   The boys that live around the corner are, for the most part, idiots.

According to Lahiri (2000: 329), the meaning of (195) is such that Mary knows part of Beethoven's fifth symphony, the meaning of (196) such that Mary knows most of Beethoven's fifth symphony, and the meaning of (197) such that most of the boys that live around the corner are idiots. There are two different realizations of the part-whole structure in the above examples. (195) and (196) are instances of partitivity to the object that gives rise to extended atomic objects: *Beethoven's fifth symphony* is divided into well-defined parts that are familiar to the speaker. In contrast, in (197), single parts are elements of the set that realizes subject DP (*the boys that live around the corner*). In particular, in (197), the subject DP is a sum individual that consists of individual boys that live around the corner (with each boy being an atomic part of that sum), cf. for instance Link (1983). Sum individuals can also occur in object position, cf. (198).

(198)   Mary mostly knows John's children.

The meaning of (198) is such that, for most x (for more than 50% of individuals realizing x) such that x is John's child, Mary knows x.

Lahiri (2000: 329) proposes a semantics of answers that operates on their natural part-structure. For that reason, the quantificational variability effect presented in (195)–(197) is expected to arise with *know*-like predicates (predicates that take both declarative and interrogative complements, for instance *know, be certain, remember, indicate, realize, list, record, guess, decide*), but not with *wonder*-like predicates (predicates that take only interrogative complements – rogative predicates according to Lahiri's (2002) classification, for instance *wonder, ask, investigate*). More precisely, in order to trigger the quantificational variability effect, sentences like the ones in (199), with the structure given in (200), must be compatible with truth-conditions specified in (201).

(199)   Jack mostly/partly/largely knows / remembers / realizes / guesses / decides who comes to the party.

(200)   *a* mostly/partly/largely *V*s wh-*Q*. (Lahiri 2000: 329)

(201)   For most/some/large "relevant" part of an answer to *Q*, *a V*s that part of that answer to *Q*. (Lahiri 2000: 329)

Hence, question-embedding *know*-type predicates receive interpretations like the ones illustrated in (202) and (203):

(202) i. John knows, for the most part, Q.
       ii. most p[ANS(p, Q) ∧ C[24](p)][John knows that p] (Lahiri 2000: 351)

(203) i. John is certain, for the most part, (about) Q.
       ii. most p[ANS(p, Q) ∧ C(p)][John is certain that p] (Lahiri 2000: 351)

As was mentioned above, in the case of *wonder*-type predicates, adverbs of quantification cannot access the meaning of the interrogative. Consider (204), adapted from Lahiri (2000: 345).

(204) i. John mostly asks / wonders which students came to the party.
       ii. John asked / wondered most of the time which students came to the party.
       iii. For most relevant part of an answer to *Q*: *Which students came to the party*?, *John asks / wonders that part of that answer to *Q*.

Lahiri (2000: 371) explains the quantificational variability effect of wh-clauses embedded under *know*-type predicates by means of the amount quantification over the algebra of answers to the wh-question. The quantificational variability effect arises if a predicate combines with a that-clause by default and allows for a (secondary) interrogative embedding. If such a predicate takes a wh-clause, it causes a type mismatch so that the interrogative must be raised at LF. This so-called **interrogative raising** results in the quantificational variability effect. In contrast, *wonder*-type predicates that only take questions do not cause any type mismatch. As a consequence, they do not rise and do not exhibit the quantificational variability effect.

5.1.3.1 A unified partition-based analysis of factive and non-factive responsive predicates

In this subchapter, I will show how to integrate the reference to parts of answers into the semantic representation of factive and non-factive responsive predicates. I will start with the former.

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[24] **C** represents a contextual variable that picks up (true) propositions = (possible) answers to the wh-question, cf. Lahiri (2000: 337). The choice of C(*p*) = ˇ*p* (the situation where C picks out only true propositions) is lexically determined, cf. Lahiri (2000: 352). In line with Lahiri (2000: 353), C(*p*) = ˇ*p* is a default case for factive predicates and some communication verbs (*tell, communicate*), but not for non-factive verbs like *be certain (about), conjecture (about), agree on*.

(205) λQλxQU[25](λp[p∈Q ∧ ˇp]) (P(p)(x))

QU(λp[p∈ ⟦who came⟧ ∧ ˇp]) (know(p)(John))

QU(λp {p | ∃x [person(x) ∧ p = came(x)] ∧ ˇp}) (know(p)(John))

In (205), a quantifying expression QU is inserted into the semantic representation of questions. QU can be realized by an existential quantifier (206), a universal quantifier (207) or any other quantifying expression. The requirement *ˇp* ensures that an embedding predicate is factive, i.e. that the set of answers to a wh-question is restricted to true propositions.

(206) ∃p{p | ∃x [person(x) ∧ p = came(x)] ∧ ˇp} (know(p)(John))
For some proposition p that is a true answer to the question 'Who came', John knows p (non-exhaustive reading).

(207) ∀p{p | ∃x [person(x) ∧ p = came(x)] ∧ ˇp} (know(p)(John))
For all propositions that, collectively, constitute a complete true answer p to the question 'Who came', John knows p (weakly-exhaustive reading).

The strongly-exhaustive answer (saying that the subject's beliefs do not support any wrong propositions) can be represented as follows.

(208) ∀p{p | ∃x [person(x) ∧ p = came(x)] ∧ ˇp ∧ ¬p(p | ∃x [person(x) ∧ p = came(x)] ∧ p∉ˇp)} (know(p)(John))
For all propositions that, collectively, constitute a complete true answer *p* to the question 'Who came', John knows *p*. For every *p* that is a wrong answer to the question 'Who came', John knows that *p* is a wrong answer to that question (strongly-exhaustive reading).

Non-factive responsive predicates lack the *ˇp* condition. As a result, the set of answers to a wh-question contains potential true answers to that question.

(209) λQλxQU(λp[p∈Q]) (P(p)(x))

QU(λp[p∈ ⟦who came⟧]) (certain(p)(John))

QU(λp {p | ∃x [person(x) ∧ p = came(x)]}) (certain(p)(John))

By analogy to factive verbs, QU can be parametrized as follows.

(210) ∃p{p | ∃x [person(x) ∧ p = came(x)]} (certain(p)(John))
∀p{p | ∃x [person(x) ∧ p = came(x)]} (certain(p)(John))

In the following, I will briefly discuss QVE in Polish.

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[25] **QU** represents any quantificational expression (*all, most, some, few*, etc.).

5.1.3.2 QVE in Polish

Examples (211)–(213) show that Polish patterns with English with respect to licensing quantificational variability effect.

(211)   Kasia   częściowo   wie   /   zgadła   /   udowodniła
         Kasia   partially   knows   /   guessed.PFV   /   proved.PFV
         /   powiedziała,   kto   przyjdzie   na   imprezę.
         /   said.PFV   who   comes   to   party
         'Kasia partially knows / guessed / proved / said who is/was coming to the party.'
         For partially relevant part of an answer to *Q*: *Who is coming to the party*?, Kasia knows / guessed / proved / said that part of that answer to *Q*.

(212)   Kasia   częściowo   zgadywała   /   udowadniała   /   mówiła,
         Kasia   partially   guessed.IPFV   /   proved.IPFV   /   said.IPFV
         kto   przyjdzie   na   imprezę.
         who   comes   to   party
         'Kasia was partially guessing / proving / saying who is/was coming to the party.'
         For the partially relevant part of an answer to *Q*: *Who is coming to the party*?, Kasia was guessing / proving / saying that part of that answer to *Q*.

(213)   Kasia   częściowo   ?dziwiła   się   /   ?zdziwiła   się
         Kasia   partially   wondered.IPFV   REFL   /   wondered.PFV   REFL
         /   #pytała   /   #zapytała,   kto   przyjdzie   na   imprezę.
         /   asked.IPFV   /   asked.PFV   who   comes   to   party
         'Kasia was partially wondering / partially wondered / was partially asking / partially asked who was coming to the party.'
         For the partially relevant part of an answer to *Q*: *Who is coming to the party*?, *Kasia was wondering / wondered / was asking / asked that part of that answer to *Q*.

Both perfective (plus 'know') (211) and imperfective (212) clause-embedding verbs investigated in this dissertation allow for two types of embedding (declarative and interrogative). Furthermore, regardless of the factivity of the matrix verb, both aspectual variants are compatible with the adverb *częściowo* as a quantifier over answers to the wh-question.[26] In contrast, rogative verbs illustrated in (213) do not license the quantificational variability effect. However, from the semantic point of view (and still under QVE-reading), the adverb appears better with *(z)dziwić się* than with *(za)pytać*, which might result from the exhaustive interpretation of the latter in the above scenario.

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[26] Interestingly, *częściowo* appears somewhat redundant in (212), which suggests that at least some imperfective verbs exhibit an inherent part-structure; this might be a direct consequence of the meaning of imperfectivity as non-completedness.

Crucially, Polish data speak in favor of the adoption of part structure of answers to wh-questions embedded under responsive predicates. Since licensing a particular type of embedding does not systematically correlate with (non)factivity (both perfective veridical/factive and imperfective non-veridical/non-factive verbs allow for the two types of subordinate clauses), the explanation of the truth-entailment of the perfective cannot be based on selectional restrictions. Instead of that, I propose that it is the part structure of proofs that captures veridicality-related differences between (im)perfective reveal-type predicates in Polish.

In the next subsection, I will briefly discuss perfectivity-bound exhaustivity of embedded questions in Polish. However, all observations should be considered a tendency. A detailed empirical investigation on this topic will be a subject for future research.

5.1.4 Exhaustivity of perfective question-embedding verbs in Polish

Some perfective question-embedding predicates in Polish favor an exhaustive interpretation of wh-questions. Consider example (214).

(214) Pani   powiedziała,   kto   przeszedł   dalej   w
lady   said.PFV   who   got.through.PFV   further   in
konkursie.
competition
'Our teacher told us who got through to the next round.'

(214) is felicitous in a scenario like (215).

(215) There is a list of pupils who participated in a competition. Their teacher knows not only who got through but also who did not. Therefore, she can make a statement about every pupil from the list. Everyone who was not part of the set of answers to the wh-question in (214) must act on the assumption that she/he did not go through.

Certain (im)perfective minimal pairs of communication verbs exhibit clear contrast with respect to exhaustivity, cf. (216) and (217).

(216) Jan   rozpowiedział,   kto   przeszedł   dalej   w
      Jan   spread.news.PFV   who   got.through.PFV   further   in
      konkursie.
      competition
      'Jan spread the news about who got through to the next round.'
      For every *x* that got through to the next round, Jan has mentioned *x*.
      = ∀*x* [pupil(*x*) ∧ got.through(*x*) → mentioned(*x*,j)][27]

(217) Jan   rozpowiadał,   kto   przeszedł   dalej   w
      Jan   spread.news.IPFV   who   got.through.PFV   further   in
      konkursie.
      competition
      'Jan was spreading the news about who got through to the next round.'
      For some *x* that got through to the next round, Jan has mentioned *x*.
      = ∃*x* [pupil(*x*) ∧ got.through(*x*) → mentioned(*x*,j)]

Assuming part structures for wh-questions makes it possible to treat the latter in a similar way to nominal arguments. In Polish, where the perfective aspect makes it more likely that the incremental nominal object is totally affected by the verbal process, it can be expected that perfective responsive predicates with comparable event-structural properties require an exhaustive set of answers to a wh-question.

It is a matter of debate as to whether an exhaustive or a non-exhaustive interpretation of wh-questions is the elementary one. Groenendijk & Stokhof (1982) assume a basic exhaustive reading and derive a non-exhaustive answer as a pragmatic special case. In contrast, Hamblin (1973) proposes a non-exhaustive semantics of questions with exhaustive pragmatic enrichment (cf. also Krifka 2011). The fact that in some languages (for instance in German, see examples (218) and (219)) an exhaustive interpretation can be explicitly marked by a quantifier speaks in favor of the latter option.

(218) Anna weiß, [wer <u>alles</u> ins Kino gegangen ist].

(219) Anna weiß, [wo <u>überall</u> man in München gute Bücher finden kann].

However, as was shown above, the set of answers to the wh-question can also be modified by adverbs like 'partially', which excludes exhaustivity. The resulting

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[27] The pair *rozpowiedzieć – rozpowiadać* 'to spread the news' seems to trigger truth-presupposition when combined with an interrogative complement. Both lexemes strongly suggest that the sentence subject has knowledge about the underlying *p*, but this effect vanishes / is much weaker with a declarative complement. This, again, indicates a relationship between question-embedding and factivity. In line with assumptions that are made in this dissertation, factive meaning is 'more stable' (less modifiable) in the perfective (216) than in the imperfective (217).

constructions are not redundant; consider the non-exhaustive alternatives to (218) and (219).

(220)　[Anna weiß <u>zum Teil</u>], wer ins Kino gegangen ist.

(221)　[Anna weiß <u>zum Teil</u>], wo man in München gute Bücher finden kann.

Crucially, *zum Teil* does not modify the meaning of a wh-sentence, but the meaning of a matrix verb; it actually cannot be placed within the subordinate clause. This suggests that the modification of exhaustivity takes place at the T-level and does not depend on *p*. As a result, we have another argument for the inherent non-exhaustivity of questions.

In Polish, perfectivity seems to be an explicit device to mark exhaustivity. A non-exhaustive interpretation can still be achieved by using for instance 'teilweise' in a way equivalent to German.

(222)　[Pani　　częściowo　powiedziała],　kto　　przeszedł　　　dalej
　　　　lady　　partially　　said.PFV　　　who　　got.through.PFV　　further
　　　　w　　konkursie.
　　　　in　　competition
　　　　'Our teacher partially told us who got through to the next round.'
　　　　For some *x* that got through to the next round, our teacher has mentioned *x*.
　　　　= ∃*x*∃*y* [pupil(*x*) ∧ teacher(*y*) ∧ got.through(*x*) → mentioned(*x,y*)]

(223)　Pani　　powiedziała,　[kto　　#częściowo　przeszedł　　　dalej
　　　　lady　　said.PFV　　　who　　partially　　got.through.PFV　　further
　　　　w　　konkursie].
　　　　in　　competition
　　　　'Our teacher told us who partially got through to the next round.'

It is worth mentioning that the modification with *all / everywhere* as presented in (218) and (219) for German is not possible in Polish. If this was the case, one would expect incompatibility of the above quantifiers with the imperfective variants (or at least a tendency towards a slight degradation in grammaticality compared to the combination with perfective counterparts, depending on the semantics of the matrix verb). The fact that Polish systematically encodes perfectivity on verbal stems explains the absence of the above-mentioned construction in the language system; the meaning of *all* seems to be somehow included in the meaning of perfectivity, which makes the perfective an explicit exhaustivity marker. For that reason, the introduction of any additional lexical exhaustivity triggers seems redundant. In contrast, German uses *alles / überall* as compensation for the lack of the grammatical category of aspect.

In the next chapter, I will discuss aspectual factors that enforce a veridical / factive interpretation of that-clauses. This relationship is the main topic of my dissertation.

5.2 Aspectual factors that enforce a factive interpretation of clause-embedding verbs

5.2.1 Aspect and the interpretation of embedded propositions in Polish[28]

5.2.1.1 The perfective as a presupposition trigger

I will begin with cases where the perfective aspect of a matrix verb triggers the truth-presupposition (factivity in the common sense) on a complement sentence. As was discussed above, truth-presupposition holds when the inference remains under negation, after the insertion of a modal adverbial or in question constructions (again, for the semantic definition of presupposition see for instance Strawson 1950). Truth-presupposition arises with the perfective *przewidzieć* 'predict', as can be seen in the following examples. '≫' marks presupposition.[29]

First, consider (224) for an affirmative sentence, showing the presence of the truth-entailment in the case of the perfective form.

<blockquote>

(224)   Ola   przewidziała,   że   Marek   boi   się   duchów.
Ola   predicted.PFV   that   Marek   fears.IPFV   REFL   ghost.PL
'Ola predicted that Marek was afraid of ghosts.'
→ Marek is afraid of ghosts.

</blockquote>

Furthermore, following (224) by *but she was not right in the end* causes a contradiction, which confirms the presence of the truth-entailment:

<blockquote>

(225) #   Ola   przewidziała,   że   Marek   boi   się   duchów,
Ola   predicted.PFV   that   Marek   fears.IPFV   REFL   ghost.PL
ale   ostatecznie   nie   miała   racji.
but   finally   NEG   had.IPFV   right
'Ola predicted that Marek was afraid of ghosts, but she was not right in the end.'

</blockquote>

The inference is absent when we embed the same proposition under the imperfective 'predict':

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[28] This chapter is based on Zuchewicz (2018).

[29] Marking embedded verbs for the imperfective aspect and using the present tense are intended to excludethe influence of perfectivity and past tense morphology within the subordinate clause on the truth inferences observed.

(226) Ola   przewidywała,   że   Marek   boi   się   duchów,
Ola   predicted.IPFV   that   Marek   fears.IPFV REFL   ghost.PL
ale   ostatecznie   nie   miała   racji.
but   finally   NEG   had.IPFV right

'Ola was predicting that Marek was afraid of ghosts, but she was not right in the end.'

↛ Marek is afraid of ghosts.

Examples (227) and (228) demonstrate the complementary behavior of the feature [± perfective] with respect to the enforcing of a factive meaning of their complement sentences. Whereas the perfective variant presupposes the truth of its sentential argument, the imperfective does not. After the insertion of a sentence negation or a modal adverbial, it still follows from (227) that Marek is/was afraid of ghosts. Sentence (228) only states that Ola was guessing / tried to predict that Marek fears ghosts, but it leaves it open whether she was correct or not.

(227) Ola   nie   /   prawdopodobnie   przewidziała,
Ola   NEG   /   probably   predicted.PFV
że   Marek   boi   się   duchów.
that   Marek   fears.IPFV   REFL   ghost.PL

'Ola did not predict / probably predicted that Marek was afraid of ghosts.'
≫ Marek is afraid of ghosts.
Adapted from: Zuchewicz (2018: 480)

(228) Ola   nie   /   prawdopodobnie   przewidywała,
Ola   NEG   /   probably   predicted.IPFV
że   Marek   boi   się   duchów.
that   Marek   fears.IPFV   REFL   ghost.PL

'Ola was not predicting / was probably predicting that Marek was afraid of ghosts.'
⊯ Marek is afraid of ghosts.
Adapted from ibid.

The truth-presupposition observed in (227) also appears in question constructions:

(229) Czy   /   kiedy   Ola   przewidziała,
whether /   when   Ola   predicted.PFV
że   Marek   boi   się   duchów?
that   Marek   fears.IPFV   REFL   ghost.PL

'Did Ola predict / when did Ola predict that Marek was afraid of ghosts?'
≫ Marek is afraid of ghosts.

As expected, the inference is absent with the imperfective *przewidywać*:

(230) Czy / kiedy Ola przewidywała,
whether / when Ola predicted.IPFV
że Marek boi się duchów?
that Marek fears.IPFV REFL ghost.PL
'Was Ola predicting / when was Ola predicting that Marek was afraid of ghosts?'
≫̸ Marek is afraid of ghosts.

It needs to be pointed out that (230) would also be compatible with the factive interpretation of a subordinate clause. The imperfective simply does not enforce the truth of the complement sentence. This observation applies to the majority of imperfective clause-embedding verbs; they do not block factivity, but are neutral with respect to it.

The above-mentioned patterns also hold for the (im)perfective *zgadnąć*.PFV – *zgadywać*.IPFV 'guess', *przeczuć*.PFV – *przeczuwać*.IPFV 'sense', *wyczuć*.PFV – *wyczuwać*.IPFV 'sense' or '*rozgryźć*.PFV – *rozgryzać*.IPFV 'crack'. (231) illustrates the truth-presupposition of the perfective.

(231) Ola nie / prawdopodobnie zgadła / przeczuła /
Ola NEG / probably guessed.PFV / sensed.PFV /
wyczuła / rozgryzła
sensed.PFV / worked.out.PFV
że Marek boi się duchów.
that Marek fears.IPFV REFL ghost.PL
'Ola did not guess / sense / work out / probably guessed / sensed / worked out that Marek was afraid of ghosts.'
≫ Marek is afraid of ghosts.

In contrast, embedded propositions are neutral with respect to truthfulness when a matrix verb is marked with the imperfective aspect, as illustrated in (232).

(232) Ola nie / prawdopodobnie zgadywała / przeczuwała /
Ola NEG / probably guessed.IPFV / sensed.IPFV /
wyczuwała / rozgryzała
sensed.IPFV / worked.out.IPFV
że Marek boi się duchów.
that Marek fears.IPFV REFL ghost.PL
'Ola was not guessing / sensing / working out / was probably guessing / sensing / working out that Marek was afraid of ghosts.'
≫̸ Marek is afraid of ghosts.

See also the expected complementary distribution in question constructions. Compare (233) for the perfective 'guess' / 'sense' / 'crack' and (234) for their imperfective counterparts.

(233) Czy / kiedy Ola zgadła / przeczuła /
whether / when Ola guessed.PFV / sensed.PFV /
wyczuła / rozgryzła,
sensed.PFV / worked.out.PFV
że Marek boi się duchów?
that Marek fears.IPFV REFL ghost.PL
'Did Ola guess / sense / work out / when did Ola guess / sense / work out
that Marek was afraid of ghosts?'
≫ Marek is afraid of ghosts.

(234) Czy / kiedy Ola zgadywała / przeczuwała /
whether / when Ola guessed.IPFV / sensed.IPFV /
wyczuwała / rozgryzała,
sensed.IPFV / worked.out.IPFV
że Marek boi się duchów?
that Marek fears.IPFV REFL ghost.PL
'Was Ola guessing / sensing / working out / when was Ola guessing /
sensing / working out that Marek was afraid of ghosts?'
≫̸ Marek is afraid of ghosts.

Crucially, the above pattern is not restricted to Polish. See (235) for the truth-presupposition of the perfective 'guess' in Czech, and (236) for the absence of that inference with its imperfective counterpart, adapted from Zuchewicz & Šimík (2018).

(235) Marie asi uhodla / neuhodla,
Marie probably guessed.PFV / NEG.guessed.PFV
že Karel je doma.
that Karel is at.home
'Marie probably guessed / did not guess (right) that Karel was at home.'
≫ Karel was at home.

(236) Marie asi hádala / nehádala,
Marie probably guessed.IPFV / NEG.guessed.IPFV
že Karel je doma.
that Karel is at.home
'Marie probably took / did not take a guess that Karel was at home.'
≫̸ Karel was at home.

Importantly, the aspect of the verb in a dependent clause does not affect the inference patterns observed so far. In the following examples, the subordinate sentence expresses an accomplishment (Vendler 1957)[30]. The matrix verbs are marked for the perfective, and the embedded verb appears once in the perfective (237) and once in the

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[30] I would like to thank Carla Umbach for pointing this out.

imperfective aspect (238). In contrast to the previous examples, it occurs in the past tense.

We can see that, regardless of the aspectual marking within the embedded clause, the truth-presupposition remains. However, (237) and (238) differ in the extent of the integration of the nominal argument 'apple' into the process of eating, which is influenced by the effect of the (im)perfective 'eat'. In (237), the truth-presupposition triggered by the perfective matrix verbs (stating that there was an event of Marek eating an apple in the actual world) is enriched by the totality entailment of the apple, triggered locally by the perfective 'eat' (stating that the apple was eaten completely, i.e. that the apple is not there in the end). In contrast, there is no totality entailment of the apple in (238), due to the imperfective aspect of 'eat' (cf. Krifka 1989b, Krifka 1989c, Krifka 1992).

(237)   Ola   nie   /   prawdopodobnie   zgadła   /   przeczuła   /
        Ola   NEG   /   probably   guessed.**PFV**   /   sensed.**PFV**   /
        wyczuła   /   rozgryzła   /   przewidziała,
        sensed.**PFV**   /   worked.out.**PFV**   /   predicted.**PFV**
        że   Marek   zjadł   jabłko.
        that   Marek   ate.**PFV**   apple
        'Ola did not guess / sense / work out / predict / probably guessed / sensed / worked out / predict that **Marek ate the apple**.'
        ≫ Marek ate the whole apple (there is nothing left of the apple). Dividable into:
        ≫ (from the matrix verb): There was an event of Marek eating an apple in the actual world.
        ≫ (from the embedded verb): The apple was eaten completely.

(238)   Ola   nie   /   prawdopodobnie   zgadła   /   przeczuła   /
        Ola   NEG   /   probably   guessed.**PFV**   /   sensed.**PFV**   /
        wyczuła   /   rozgryzła   /   przewidziała,
        sensed.**PFV**   /   worked.out.**PFV**   /   predicted.**PFV**
        że   Marek   jadł   jabłko.
        that   Marek   ate.**IPFV**   apple
        'Ola did not guess / sense / work out / predict / probably guessed / sensed / worked out / predict that **Marek was eating an apple**.'
        ≫ Marek was eating an apple (it is left open whether the apple was eaten completely).
        Dividable into:
        ≫ (from the matrix verb): There was an event of Marek eating an apple in the actual world.
        ⋡ (from the embedded verb): The apple was eaten completely.

Compare (239) and (240) with the imperfective matrix verbs.

(239) Ola   nie   / prawdopodobnie   zgadywała   / przeczuwała /
Ola   NEG   / probably   guessed.**IPFV** / sensed.**IPFV** /
wyczuwała / rozgryzała   / przewidywała,
sensed.**IPFV** / worked.out.**IPFV** / predicted.**IPFV**
że   Marek   zjadł   jabłko.
that   Marek   ate.**PFV**   apple

'Ola was not guessing / sensing / working out / predicting / was probably guessing / sensing / cracking / predicting that **Marek ate the apple**.'

⤷̸ Marek ate the whole apple.

⤷̸ Marek was eating an apple.

(240) Ola   nie   / prawdopodobnie   zgadywała   / przeczuwała /
Ola   NEG   / probably   guessed.**IPFV** / sensed.**IPFV** /
wyczuwała / rozgryzała   / przewidywała,
sensed.**IPFV** / worked.out.**IPFV** / predicted.**IPFV**
że   Marek   jadł   jabłko.
that   Marek   ate.**IPFV**   apple

'Ola was not guessing / sensing / working out / predicting / was probably guessing / sensing / working out / predicting that **Marek was eating an apple**.'

⤷̸ Marek was eating an apple.

The lack of truth-presupposition of the matrix verb has an influence on the totality entailment of the nominal argument within a subordinate clause. This is why I did not subdivide the general inference as was done in the case of (237) and (238).

(239) could be followed by: *because he used to eat her food in the past. But look, her apple is in the fridge.* / *But he only took one bite of it*. This corresponds to our intuitive interpretation of the sentence; since the existence of the whole event is not presupposed, the parts of it cannot be presupposed either.

The exact differences between the particular verb forms (especially between the two perfective variants of 'sense' and their imperfective twins) will be discussed in the experimental part of this dissertation.

5.2.1.2   The perfective as an entailment trigger

According to Zuchewicz (2018: 486), many perfective matrix verbs show implicative (but not a presuppositional) behavior with respect to the truth-inference of the embedded proposition. For instance, verbs of proving (or incremental theme verbs in general) entail that their sentential argument is true, which can be seen in the examples (241) and (242). *Udowodnić*, *dowieść* and *wykazać* seem to be much stronger in their veridicality than *pokazać* though.

(241) Ola udowodniła / dowiodła / wykazała / pokazała,
Ola proved.PFV / proved.PFV / revealed.PFV / showed.PFV
że Marek boi się duchów,
that Marek fears.IPFV REFL ghost.PL
'Ola proved / revealed / showed that Marek was afraid of ghosts.'
→ Marek is afraid of ghosts.

(242) # Ola udowodniła / dowiodła / wykazała /
Ola proved.PFV / proved.PFV / revealed.PFV /
pokazała, że Marek boi się duchów,
showed.PFV that Marek fears.IPFV REFL ghost.PL
ale ostatecznie nie miała racji.
but finally NEG had.IPFV right
'Ola proved / revealed / showed that Marek was afraid of ghosts, but she was not right in the end.'

The inference vanishes under negation, after the insertion of a modal adverbial (243) and in question constructions (244), which excludes it from being a presupposition.

(243) Ola nie / prawdopodobnie udowodniła / dowiodła
Ola NEG / probably proved.PFV / proved.PFV
wykazała / pokazała,
revealed.PFV / showed.PFV
że Marek boi się duchów.
that Marek fears.IPFV REFL ghost.PL
'Ola did not prove / reveal / show / probably proved / revealed / showed that Marek was afraid of ghosts.'
↛ Marek is afraid of ghosts.

(244) Czy / kiedy Ola udowodniła / dowiodła
whether / when Ola proved.PFV / proved.PFV
wykazała / pokazała,
revealed.PFV / showed.PFV
że Marek boi się duchów?
that Marek fears.IPFV REFL ghost.PL
'Did Ola prove / reveal / show / when did Ola prove / reveal / show that Marek was afraid of ghosts?'
↛ Marek is afraid of ghosts.

The imperfective counterparts do not enforce the truth of their complements. (245) shows that there is no entailment in an affirmative sentence.

(245) Ola   udowadniała   /   dowodziła   /   wykazywała   /   pokazywała,
Ola   proved.IPFV   /   proved.IPFV   /   revealed.IPFV   /   showed.IPFV
że   Marek   boi   się   duchów,
that   Marek   fears.IPFV   REFL   ghost.PL
ale   ostatecznie   nie   miała   racji.
but   finally   NEG   had.IPFV   right.
'Ola was proving / revealing / showing that Marek was afraid of ghosts, but
she was not right in the end.'
↛ Marek is afraid of ghosts.

As expected, the truth-inference is also absent under negation, after the insertion of a
modal adverbial (246) and in question constructions (247).

(246) Ola   nie   /   prawdopodobnie   udowadniała   /   dowodziła
Ola   NEG   /   probably   proved.IPFV   /   proved.IPFV
wykazywała   /   pokazywała,
revealed.IPFV   /   showed.IPFV
że   Marek   boi   się   duchów.
that   Marek   fears.IPFV   REFL   ghost.PL
'Ola was not proving / revealing / showing / was probably proving /
revealing / showing that Marek was afraid of ghosts.'
↛ Marek is afraid of ghosts.

(247) Czy   /   kiedy   Ola   udowadniała   /   dowodziła
whether   /   when   Ola   proved.IPFV   /   proved.IPFV
wykazywała   /   pokazywała,
revealed.IPFV   /   showed.IPFV
że   Marek   boi   się   duchów?
that   Marek   fears.IPFV   REFL   ghost.PL
'Was Ola proving / revealing / showing / when was Ola proving / revealing
/ showing that Marek was afraid of ghosts?'
↛ Marek is afraid of ghosts.

An interesting observation concerns 'confirm'. The perfective *potwierdzić* tends to
trigger a weak truth-entailment, which is why I assigned it to the entailment group. In
contrast to the other members of this class, however, it lacks an incremental character,
i.e. the perfective does not build on the action/process denoted by its imperfective twin.
In the further part of the paper, I will give experimental evidence in favor of treating
'confirm' as a communication verb instead. By now, an entailment pattern is distributed
as follows.

(248)   Policjant   potwierdził,   że   Marek boi   się
policeman   confirmed.PFV   that   Marek fears.IPFV   REFL
duchów.
ghost.PL
'The policeman confirmed that Marek was afraid of ghosts.'
→ Marek is afraid of ghosts.
Adapted from: Zuchewicz (2018: 481)

(249)   Policjant   potwierdzał,   że   Marek boi   się
policeman   confirmed.IPFV   that   Marek fears.IPFV   REFL
duchów.
ghost.PL
'The policeman was confirming that Marek was afraid of ghosts.'
↛ Marek is afraid of ghosts.
Adapted from ibid.

In line with Zuchewicz (2018: 481), the truth entailment can be found in *potwierdzić* and it is absent in *potwierdzać*; whereas (248) seems to entail that Marek is afraid of ghosts, (249) states that this is a possible, but not an obligatory interpretation. The inference presented in (248) does not project – either under negation / after the insertion of a modal adverbial (250) or in question constructions (251) – which confirms that it is not a presupposition.

(250)   Policjant   nie   /   prawdopodobnie potwierdził,
policeman   NEG   /   probably   confirmed.PFV
że   Marek   boi   się   duchów.
that   Marek   fears.IPFV REFL   ghost.PL
'The policeman did not confirm / probably confirmed that Marek was afraid of ghosts.'
↛ Marek is afraid of ghosts.
Adapted from ibid.

(251)   Czy   /   kiedy policjant   potwierdził,
whether /   when   policeman   confirmed.PFV
że   Marek   boi   się   duchów?
that   Marek   fears.IPFV REFL   ghost.PL
'Did the policeman confirm / when did the policeman confirm that Marek was afraid of ghosts?'
↛ Marek is afraid of ghosts.
Adapted from ibid.

However, emphasizing *potwierdził* by prosody in (251) presupposes the existence of the event described by the dependent clause, which means that the embedded proposition receives a factive interpretation. The effect seems to be stronger if the agent represents an instance known for her reliability, like policeman, inspector or judge. The fact that

the nature of the subject can influence the entailment pattern also suggests a difference between 'confirm' and the other verbs from the entailment group.

The entailment pattern remains when the embedded proposition is an accomplishment. Consider the following examples, with the perfective matrix verbs and the perfective (252) and the imperfective embedded verb (253).

(252) Ola udowodniła / dowiodła / wykazała / pokazała,
Ola proved.**PFV** / proved.**PFV** / revealed.**PFV** / showed.**PFV**
że Marek przeszedł przez ulicę.
that Marek crossed.**PFV** through street
'Ola proved / revealed / showed that **Marek had crossed the street**.'
→ Marek had crossed the street (he is on the other side of the street). Dividable into:
→ (from the matrix verb): There was an event of Marek crossing the street in the actual world.
→ (from the embedded verb): Marek is on the other side of the street.

(253) Ola udowodniła
              / dowiodła / wykazała / pokazała,
Ola proved.**PFV** / proved.**PFV** / revealed.**PFV** / showed.**PFV**
że Marek przechodził przez ulicę.
that Marek crossed.**IPFV** through street
'Ola proved / revealed / showed that **Marek was crossing the street**.'
→ Marek was crossing the street. Dividable into:
→ (from the matrix verb): There was an event of Marek crossing the street in the actual world.
↛ (from the embedded verb): Marek is on the other side of the street.

Compare the imperfective matrix verbs with the perfective (254) and the imperfective (255) embedded verb.

(254) Ola udowadniała / dowodziła / wykazywała / pokazywała,
Ola proved.**IPFV** / proved.**IPFV** / revealed.**IPFV** / showed.**IPFV**
że Marek przeszedł przez ulicę.
that Marek crossed.**PFV** through street
'Ola was proving / revealing / showing that **Marek had crossed the street**.'
↛ Marek had crossed the street.
↛ Marek was crossing the street.

(255) Ola udowadniała / dowodziła / wykazywała / pokazywała,
Ola proved.**IPFV** / proved.**IPFV** / revealed.**IPFV** / showed.**IPFV**
że Marek przechodził przez ulicę.
that Marek crossed.**IPFV** through street
'Ola was proving / revealing / showing that **Marek was crossing the street**.'
↛ Marek was crossing the street.

Both (254) and (255) could be followed by: *but it turned out that he did not even try to cross it / but he turned back after walking a few steps*.

5.2.1.3 The apparent cancelability of the truth-entailment

At first sight, the inference patterns discussed in the previous subsection seem to be influenceable by the argument structural properties of embedding verbs. According to Zuchewicz (2018: 487), aspect-dependent truth-entailment in Polish is apparently cancelable after the addition of an experiencer; cf. Anand & Hacquard (2014) for this aspect-independent correlation. All verb pairs from the entailment group allow an experiencer as their optional argument.

Anand & Hacquard (2014: 73) refer to verbs like *demonstrate, guarantee, imply, prove* or *show* as 'predicates of demonstration'. The authors point out that these verbs can take subjects that do not need to be animate, and thus are incapable of holding beliefs, compare (256).

(256) The bloody gloves demonstrate / imply / prove / show that Mary is the murderer. (Adapted from ibid.)

(256) seems to entail that Mary is the murderer. Example (257) illustrates that there is no projection pattern, which means that (256) does not presuppose that *p*.

(257) Do the bloody gloves demonstrate / imply / prove / show that Mary is the murderer? (Adapted from ibid., 74.)

Furthermore, veridicality vanishes after the insertion of an overt experiencer:

(258) The bloody gloves demonstrate / imply / prove / show to John that Mary is the murderer. (Adapted from ibid.)

Following Jackendoff (2007), predicates of demonstration probably lack an experiencer argument in their semantic representation, and they gain it for cases like (258) via a lexical rule. Alternatively, these verbs do include a covert experiencer / judge, which, according to Stephenson 2007, may be replaced with overt pronominal counterparts; cf. Anand & Hacquard (2014: 74).

In line with ibid., if these predicates lack an experiencer argument when bare, we need to assume an additional case of veridicality without a private (doxastic) state. In contrast, adopting the view of the presence of a covert experiencer results in the occurrence of a private state without an entailment. Importantly, in both cases, we lack a (doxastic) private state and veridicality simultaneously, which is one of the main points of Anand & Hacquard's investigations.

It is worth mentioning that the animacy of the subject influences the semantic relation between the that-clause and the matrix predicate; in the above examples, the bloody gloves are the instrument that proves *p*. In the case of animate subjects, the subject is a verifier/controller and not the instrument; here, we do not know what the crucial proof is; we only know who delivered it and what was proven. The non-veridicality of incremental theme verbs demonstrated in (258) seems to be due to the fact that the bloody gloves have not been acknowledged/accepted as a proof by the highest/an appropriate instance, and not to the fact that 'prove' itself allows for a non-veridical interpretation (cf. Moulton 2009 for the discussion about *prove* and *proof*).

In Polish, incremental theme verbs seem to combine with inanimate subjects too (it is a very marked construction though), as shown in (259). However, only animate subjects allow for the addition of an experiencer, consider (260).

(259) ?? Zakrwawione   rękawiczki udowodniły / dowiodły
           bloody   gloves   proved.PFV   / proved.PFV
           wykazały   / pokazały   # Oli,   że   Marek   jest
           revealed.PFV / showed.PFV   Ola.DAT   that Marek   is
           winny.
           guilty.
           'The bloody gloves proved / revealed / showed to Ola that Marek was guilty.'
           → Marek is guilty.
           → The proof for Marek's guilt were the bloody gloves.

(260) Jan   udowodnił   / dowiódł   / wykazał   / pokazał
       Jan   proved.PFV   / proved.PFV / revealed.PFV / showed.PFV
       Ani,   że   Marek   boi   się   duchów,
       Ania.DAT   that   Marek   fears.IPFV REFL   ghost.PL
       jednak   Krzysiek w   to   wątpi.
       but   Krzysiek in this   doubts
       'Jan proved / revealed / showed to Basia that Marek was afraid of ghosts, but Krzysiek doubts that.'
       ↛ Marek is afraid of ghosts.

(260) truly means that Jan managed to convince Ania that Marek is afraid of ghosts, but he did not succeed in convincing Krzysiek. Adding an overt experiencer clearly leads to changing the lexical entry of perfective incremental theme verbs in Polish. As a result,

their meaning corresponds more to 'convince' than to 'prove'. If we convinced someone that p (by using the perfective *przekonać*), it means that the recipient took the truth of p for granted, but it does not entail that p is true. This is why I assume that there is no experiencer argument in the semantic representation of incremental theme verbs, and that the truth-entailment of the perfective cannot be canceled.

Anand & Hacquard (2014: 70) discuss the distribution of factivity and veridicality across English attitude verbs that take declarative complements. They realize the absence of factive assertives. However, cross-linguistically, we can easily find counterexamples. For instance, certain perfective communication verbs in Hungarian can only have a factive meaning (cf. chapter 7.1.1). More precisely, *meg-mond* 'to say' and *meg-ír* 'to write' are presupposition-triggers. They are incompatible with clausal complements that express wrong states of affairs (for example with 'that the earth is flat' or 'that there is no life on earth'). Only their imperfective counterparts can combine with unverified / incorrect statements.

In the next subsection, I will discuss cases where the perfective aspect might trigger a weak truth-implicature.

5.2.1.4 The perfective as an implicature trigger

According to Zuchewicz (2018: 481), a weak truth-implicature might arise with perfective verbs of communication. Its availability depends on many factors however. Consider the following examples. '⇒' marks implicature.

(261) **Policjant** powiedział, że **Marek jest winny**.
       policeman said.PFV that Marek is guilty
       'The policeman said that Marek was guilty.'
       ⇒ Marek is guilty.
       Adapted from: Zuchewicz (2018: 481)

(262) **Policjant** mówił, że **Marek jest winny**.
       policeman said.IPFV that Marek is guilty
       'The policeman was saying that Marek was guilty.'
       ⇒ Marek is guilty.
       Adapted from: Zuchewicz ibid.

Examples (261) and (262) demonstrate that, if the subject is an instance generally held in high esteem, both perfective and imperfective 'say' suggest that p is true. Nevertheless, the inference remains stronger with the perfective. This claim is based on the observation that it seems to be more likely to combine the imperfective variant with the adverb *niby* 'apparently' than the perfective one. Consider (263).

(263) Policjant **niby** **mówił**, że Marek jest winny.
policeman apparently said.IPFV that Marek is guilty
'The policeman apparently said hat Marek was guilty.'
⇏ Marek is guilty.

It needs to be pointed out that the perfective could also be used in (263), resulting in the same inference. The imperfective sounds more natural though, especially in the case of reported speech.[31]

5.2.1.5 Factors relevant for the existence of the truth-implicature: Reliability condition, speech acts and lexical-semantic properties of the complex expression

Based on Zuchewicz (2018: 481), the presence of the truth-implicature might correlate with the so-called **reliability condition** (cf. Schlenker 2010 for the factivity of announcements). This states that the speaker takes the truth of what the sentence subject said for granted if she (the speaker) uses a perfective communication verb. In the imperfective variant, however, the speaker does not want to commit herself to the truth of the proposition. In this case it remains open whether the speaker considers the sentence subject reliable or whether she believes that what the sentence subject said was true. As a result, there is no truth-implicature on p. The reliability effect seems to correlate with fulfilling all the parts of the speech act, which is necessarily the case when using the perfective, and which does not have to be the case when using the imperfective; Zuchewicz (2018: 488), see also Cohen & Krifka (2014), Krifka (2015) for commitment space semantics.

According to Austin (1962) (see also Searle 1969), a speech act consists of three partial acts. The first one, a locutionary act, refers to uttering itself (act of uttering). The second one, an illocutionary act, captures the area of the speaker's intention. Finally, the notion of perlocutionary act concerns the 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, entail the complete fulfillment of all parts of the speech act, as example (264) illustrates; Zuchewicz (2018: 488).[32]

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[31] In the NKJP, cf. Pęzik (2012), we can find 26 instances of the collocation 'niby mówić.PST': niby___mówił*|mówil*, and 28 instances of the collocation 'niby powiedzieć.PST': niby___powiedział*|powiedzieli* (19.02.2019), which means that the corpus data do not reveal any difference between the two aspectual partners with respect to their well-formedness with *niby*. The search queries identified all conjugation forms in the past tense. Again, using the past tense was due to the fact that it is the only tense available for both the perfective and the imperfective, so it ensured a quantitatively fair comparison between the two forms. These results suggest that more detailed research, especially based on analyzing contexts in which the particular constructions occur, needs to be conducted.

[32] I would like to thank Manfred Krifka for inspiring this idea.

(264) Iza   właśnie go   o   tym   # zawiadomiła   /
       Iza   just   him   about that   notified.PFV   /
       zawiadamiała, ale przerwał jej   w   pół   słowa.
       notified.IPFV   but   interrupted her   in   middle word
       'Iza has just notified / was just notifying him about that, but he interrupted
       her in the middle of the sentence.'
       Adapted from: Zuchewicz (2018: 489)

Only *zawiadomiła* entails that the hearer received all the information.

In general, the perfectivity-dependent truth-implicature tends to arise with non-suppletive aspectual pairs:

(265) **Policjant** zawiadomił nas,   że   **Marek** **jest** **winny**.
       policeman   notified.PFV us   that Marek   is   guilty
       'The policeman notified us that Marek was guilty.'
       ⇒ Marek is guilty.

(266) **Policjant** zawiadamiał nas,   że   **Marek** **jest** **winny**.
       policeman   notified.IPFV us   that Marek   is   guilty
       'The policeman was notifying us that Marek was guilty.'
       ?⇏ Marek was guilty.

Crucially (and as has already been shown), when there is an additional inference trigger, the aspect-dependent truth-implicature seems to be systematically available.

(267) Policjant   powiedział nam   /   poinformował   nas,
       policeman   said.PFV   we.DAT   /   informed.PFV   we.GEN
       że   Marek   jest   winny,
       that Marek   is   guilty
       ? ale jakoś   bez   przekonania   /
          but somehow   without   confidence   /
       ? ale ja   mu   nie   wierzę.
          but I   him   NEG   believe
       'The policeman told us / informed us that Marek was guilty, but he seemed
       not to be sure somehow / but I do not believe him.'
       ⇒ Marek is guilty.

(268) Policjant   mówił   nam   /   informował   nas,
policeman   said.IPFV   we.DAT   /   informed.IPFV   we.GEN
że   Marek   jest   winny,
that   Marek   is   guilty
ale   jakoś   bez   przekonania   /
but   somehow   without   confidence   /
ale   ja   mu   nie   wierzę.
but   I   him   NEG   believe
'The policeman was telling us / was informing us that Marek was guilty,
but he seemed not to be sure somehow / but I do not believe him.'
⇏ Marek is guilty.

Compared to (267), (268) seems to be more likely to be followed by *but he seemed not to be sure somehow / but I do not believe him*. This shows that an additional inference trigger reveals the truth-related contrast even in the case of the (im)perfective verbs of communication.

In the following examples, the subject within the matrix clause is a proper name, so we cannot verify her reliability. It seems that the truth-implicature is absent with the imperfective 'say'; the sentence only reports Jan's utterance, without making any statements about whether it is true.

(269) **Jan**   powiedział,   że   **Marek**   **jest**   **winny**.
Jan   said.PFV   that   Marek   is   guilty
'Jan said that Marek was guilty.'
⇒ Marek is guilty.

(270) **Jan**   mówił,   że   **Marek**   **jest**   **winny**.
Jan   said.IPFV   that   Marek   is   guilty
'Jan was saying that Marek was guilty.'
⇏ Marek is guilty.

Examples (271) and (272) contain an additional modification of the content of the embedded clause. In contrast to (269) and (270), it denotes a subjective state of mind (something which cannot be objectively proven). In this case, and especially if the sentences are read out of context, the truth-implicature of the perfective vanishes.

(271) **Jan**   powiedział,   że   **Marek**   **jest**   **śmieszny**.
Jan   said.PFV   that   Marek   is   funny
'Jan said that Marek was funny.'
⇏ Marek is funny.

(272) **Jan** mówił, że **Marek** **jest** **śmieszny**.
Jan said.IPFV that Marek is funny
'Jan was saying that Marek was funny.'
⇏ Marek is funny.

In this subsection, we saw that the truth-implicature of the perfective verbs of communication is restricted to certain contexts, and that its availability may vary among speakers. Necessary conditions for the occurrence of the truth-implicature include reliability of the sentence subject and the verifiable character of the proposition from the that-clause. Also the morphological structure of the aspectual pairs needs to be taken into consideration. A more detailed explanation of the last-mentioned factor will be proposed in the experimental part of this dissertation.

5.2.2   Establishing a new test for the perfectivity-factivity dependency

Zuchewicz & Šimík proposed an additional test that yields further evidence of the perfectivity-dependent truthfulness in Polish and Czech. Consider the following examples.

(273) Zgadł / przewidział / wyczuł / przeczuł, że
guessed.PFV / predicted.PFV / sensed.PFV / sensed.PFV that
Ada kłamie, co nas zdziwiło.
Ada lies, what us surprised.
'He guessed / predicted / sensed that Ada was lying, which surprised us.'
i. The fact that Ada was lying surprised us.
ii. The fact that he got it right that Ada was lying surprised us.

(274) Zgadywał / przewidywał / wyczuwał / przeczuwał,
guessed.IPFV / predicted.IPFV / sensed.IPFV / sensed.IPFV
że Ada kłamie, co nas zdziwiło.
that Ada lies, what us surprised.
'He took a guess / was predicting / sensing that Ada was lying, which surprised us.'
i. #The fact that Ada was lying surprised us.
ii. The fact that he took a guess / was predicting / sensing that Ada was lying surprised us.

(275) Udowodnił / dowiódł / wykazał / pokazał, że
proved.PFV / proved.PFV / revealed.PFV / showed.PFV that
Ada kłamie, co nas zdziwiło.
Ada lies, what us surprised.
'He proved / revealed / showed that Ada was lying, which surprised us.'
i. The fact that Ada was lying surprised us.
ii. The fact that he proved / revealed / showed that Ada was lying surprised us.

(276) Udowadniał / dowodził / wykazywał / pokazywał,
proved.IPFV / proved.IPFV / revealed.IPFV / showed.IPFV
że Ada kłamie, co nas zdziwiło.
that Ada lies, what us surprised.
'He took a guess / was predicting / sensing that Ada was lying, which surprised us.'
i. #The fact that Ada was lying surprised us.
ii. The fact that he was collecting evidence / revealing / showing that Ada was lying surprised us.

First, because *(z)dziwić* 'surprise' is inherently factive, its complement needs to denote a true proposition. Second, that-clauses embedded under *zgadnąć* 'guess.PFV', *przewidzieć* 'predict.PFV', *wyczuć* 'sense.PFV', *przeczuć* 'sense.PFV' in (273), and under *udowodnić* 'prove.PFV', *dowieść* 'prove.PFV', *wykazać* 'reveal.PFV', *pokazać* 'show.PFV' in (275), must denote true propositions too, due to truth-presupposition and truth-entailment requirements of the perfective. For that reason, *co* 'what' (or, similarly, its demonstrative counterpart *to* 'that') can refer to the that-clause in these cases. Naturally, one can also refer to the fact expressed by the matrix attitude; in this case, the proposition expressed by the that-clause is established / known in the discourse. In contrast, *co* 'what' cannot directly refer back to the proposition embedded under the imperfective counterparts in (274) and (276). Sentences embedded under these imperfective attitude predicates are neutral with respect to truthfulness, therefore only the guessing / predicting / sensing / proving / revealing / showing process itself is accessible as a discourse referent of the object of 'surprise' (cf. Zuchewicz & Šimík).

5.2.3 Semantically-driven realizations of perfectivity-dependent truthfulness in Polish

Based on Zuchewicz (2018: 489), I assume that the aspectual operator PFV introduces a nearly unspecified truthfulness feature that is parametrized by factivity, veridicality or truth-implicature via the dependency between the truth of an embedded proposition p and an event e denoted by the matrix verb. See (277) for a factive, (278) for a veridical, and (279) for an implicature-like interpretation of clause-embedding predicates in Polish (adapted from Zuchewicz 2018: 489-490).

(277) For a VP with a propositional complement p
PFV(λe ⟦VP⟧ (e) such that the truth of p is independent of e)
$\rightarrow e$ exists in the world of evaluation (factivity)

(278) For a VP with a propositional complement p
PFV(λe ⟦VP⟧ (e) such that the truth of p is dependent on e)
$\rightarrow e$ is verifiable in the world of evaluation (veridicality)

(279)   For a VP with a propositional complement *p*
PFV(λe 〚VP〛 (*e*) such that the truth of *p* is communicated by *e*)
→ *e* is likely to exist in the world of evaluation (truth-implicature)

If the truth of *p* holds regardless of the truth of *e*, *e* exists in the world of evaluation, i.e. an embedding verb is factive. In this case, there is no incremental creation of belief. For instance, the truth of propositions embedded under perfective *zgadnąć* 'guess', *przewidzieć* 'predict' or *przeczuć* 'sense' holds independently of the processes of guessing / predicting / sensing. In contrast, if the truth of *p* does depend on the truth of *e*, *e* becomes verifiable in the world of evaluation, and a matrix verb receives a veridical interpretation. Here, the truth of *p* is being incrementally created, and is a final consequence of the completion of a process denoted by *e* – the process of proving, revealing, showing, etc. Finally, if the truth of *p* is communicated by *e*, *e* is 'only' likely to exist in the world of evaluation. Zuchewicz (2018: 490) points out that it is unclear whether the realization of the truthfulness feature by an optional truth-implicature should count as realization at all. Alternatively, we could assume that, in the case of verbs of communication, the truthfulness introduced by PFV remains unspecified. In order to decide how to treat implicature, more empirical research needs to be done.

5.2.4   Additional evidence: Nominalization constructions

In the following, I will show that nominalization constructions provide further evidence for the correlation between perfectivity and truthfulness.

The relationship between the perfective aspect of clause-embedding verbs and a truth-related interpretation of complement sentences in Polish can also be seen in nominalization constructions, cf. Zuchewicz & Šimík (2018). First, I will consider nominals derived from presupposition verbs. (280) illustrates an eventuality nominal built from the imperfective *guess*, and (281) an eventuality nominal built from the perfective counterpart.

(280)   **Zgadywanie**, że   JAN   ukradł klucze,   było   błędne.
guessing.IPFV   that   Jan   stole   keys   was   wrong
Okazało   się,   że   to   Marka   sprawka.
turned.out   REFL   that   this   Marek.GEN   doing
'Guessing that it was Jan who stole the keys was wrong. It turned out that it was Marek's doing.'
↛ Jan is guilty.

(281) #**Zgadnięcie**, że   JAN   ukradł klucze, było   błędne.
       guessing.PFV   that   Jan   stole   keys   was   wrong
       Okazało   się,   że   to   Marka   sprawka.
       turned.out REFL   that this Marek.GEN   doing
       'Successfully guessing that it was Jan who stole the keys was wrong. It
       turned out that it was Marek's doing.'
       → Jan is guilty.

Nominals built from incremental theme verbs that yield a veridical meaning of an
embedded proposition pattern with those built from presupposition verbs. Consider
(282) for an object nominal 'proof', (283) for eventuality nominals derived from
imperfective incremental theme verbs, and (284) for eventuality nominals derived from
the perfective twins.

(282) Potencjalny **dowód**   (na to),   że   Jan   jest   winny,
       potential   proof   for   that   that Jan   is   guilty
       okazał   się   nieprawdziwy.
       turned.out REFL   false
       'The potential proof of Jan's guilt turned out to be false.'
       ↛ Jan is guilty.

(283) **Udowadnianie / dowodzenie   / wykazywanie   / pokazywanie**
       proving.IPFV   / proving.IPFV / revealing.IPFV / showing.IPFV
       że   Jan   jest winny,   zakończyło się   fiaskiem.
       that Jan   is   guilty   finished   REFL   failure.INS
       'Proving / revealing / showing that Jan is guilty failed.'
       ↛ Jan was guilty.

(284) #**Udowodnienie / #dowiedzenie,   / #wykazanie   / #pokazanie**,
       proving.PFV   / proving.PFV   / revealing.PFV / showing.PFV
       że   Jan   jest winny,   zakończyło się   fiaskiem.
       that Jan   is   guilty   finished   REFL   failure.INS
       'Successfully proving / revealing / showing that Jan is guilty failed.'
       → Jan was guilty.

By analogy to the behavior of the respective matrix verbs, only the nominals built from
the perfective entail that p is true.

6 Factivity of the imperfective

This dissertation aims to explain the relationship between the perfective aspect of clause-embedding verbs in Polish and a factive interpretation of embedded propositions. However, it does not intend to claim that the imperfective aspect necessarily blocks the factive meaning of a complement sentence; on the contrary, the imperfective is often compatible with factivity of the complement. Crucially, the truth-inference that goes along with the imperfective is never realized as presupposition or entailment; it is a context-bound cancellable implicature.

6.1 (Non)factive imperfective verb pairs according to Danielewiczowa (2002)

Danielewiczowa (2002) investigates how knowledge is encoded in the case of (non)factive imperfective epistemic verbs in Polish. She differentiates between the state of knowledge of the **kontroler-nadawca** ('a controlling addresser', 'speaker': an entity that is using a particular verb in her utterance), and the state of knowledge of the **podmiot epistemiczny** ('the epistemic subject': an entity whose characteristic is given / described by the imperfective verb). Danielewiczowa introduces the semantic representations of epistemic verbs in Polish by proposing two different entries for imperfective verbs that receive a factive interpretation if the main stress is put on the embedding-verb and not on the propositional complement, e.g. *CZUĆ* vs. *czuć* 'feel'.

6.1.1 The role of prosody in making imperfective verbs factive

Danielewiczowa (2002: 52) identifies three different prosody-based situation types that Polish epistemic state verbs can be assigned to.

Within the first group, the main accent can be placed either on the complement proposition or on the embedding verb. Different positions of stress do not influence the meaning of the respective epistemic verb; they only modify the thematic-rhematic structure of an utterance, for instance in the case of *wiedzieć* 'know'. We can identify three subgroups here: first, factive verbs that presuppose the truthfulness of a complement sentence, more precisely, that presuppose both the epistemic subject's and the speaker's knowledge about the fact that a particular state of affairs holds (ibid., 54). For this group of verbs, the epistemic predicate is most likely to be stressed and not the complement proposition. The members of this subclass are for example: *uprzytamniać sobie / uświadamiać sobie* 'realize', *orientować się* 'know about', *domyślać się* 'suspect', *pamiętać* 'remember', *przypominać sobie* 'recall', etc.
The second subgroup consists of verbs that imply the speaker's knowledge about the fact that the particular state of affairs does not hold or that there are some doubts regarding its holding (ibid., 55). Here, it is most likely / less marked for the proposition to be accented and not the epistemic predicate. The members of this subgroup are for instance: *mylić się* 'be wrong', *okłamywać się* 'deceive oneself', *mamić się* 'beguile oneself', *zwodzić się* 'delude oneself'.

Finally, there are verbs which do not presuppose anyone's knowledge about the factivity of the embedded proposition, for instance: *być pewnym* 'be certain', *być przekonanym* 'be positive about', *mieć nadzieję* 'hope', *liczyć się z* 'reckon with'.

Within the second prosody-based group, the main accent is always placed on the propositional argument. While the sentence *Ewa myśli, że pięknie ŚPIEwa* 'Ewa thinks that she sings beautifully' is correct, * *Ewa MYŚli, że pięknie śpiewa* is not. However, (and also noticed by Danielewiczowa), after the introduction of an explicit contrast, we can put the main stress on the epistemic verb without changing the verb's meaning. Consider the following example:

(285) Ewa   wcale   nie   MYŚli,   że   pięknie   śpiewa,   ona
       Ewa   at.all   NEG   thinks.IPFV   that   beautifully   sings,   she
       jest   o   tym   święcie   przekoNAna   /   tak   ci   się
       is   about   that   firmly   confirmed   /   so   you.DAT   REFL
       tylko   wyDAje.
       only   seems
       'Ewa₁ does not THINK that she₁ sings beautifully, she₁ firmly beLIEVes
       so / that is only your impREssion.'

Other members of this class are: *przypuszczać* 'suppose', *obawiać się* 'be afraid', *odnosić wrażenie* 'have an impression', *przewidywać* 'predict', *sądzić, być zdania,* 'think' *zakładać* 'assume', etc. Verbs belonging to this group do not imply anyone's knowledge of whether the embedded proposition is true.

In the third group, the main accent can be placed either on the epistemic predicate or on the propositional argument. The crucial observation here is that different positions of stress give rise to different interpretations of the matrix verb with respect to factivity. This is why this group is the most relevant one for the purpose of this chapter and this dissertation in general: it reveals cases where factivity goes along with the imperfective aspect. According to Danielewiczowa, epistemic verbs that belong to this class consist of a factive and a non-factive variant, each having a distinct semantic representation. Consider (286) for the factive version of 'suspect'.

(286) Jan   podejRZEwa,   że   ma   raka.
       Jan   suspects.IPFV   that   has   cancer
       'Jan suspects that he has cancer.'
       Adapted from ibid., 57

With an accent on the matrix verb, (286) presupposes that Jan has cancer. More precisely, what is presupposed here is the speaker's knowledge about this fact (ibid., 58). The truth-inference does not vanish under negation or after the insertion of a modal adverbial, which confirms that it is a presupposition. From both

(287)   Jan   nie   podejRZEwa,   że   ma   raka.
             Jan   NEG   suspects.IPFV   that   has   cancer
             'Jan does not suspect that he has cancer.'

and

(288)   Jan   prawdopodobnie   podejRZEwa,   że   ma   raka.
             Jan   probably   suspects.IPFV   that   has   cancer
             'Jan probably suspects that he has cancer.'

it still follows that Jan has cancer. However, the truth-inference vanishes after the introduction of an explicit contrast to the embedding proposition:

(289)   Jan   wcale   nie   podejRZEwa,   że   ma   raka,   on   tylko
             Jan   at.all   NEG   suspects.IPFV   that   has   cancer   he   only
             uDAje.
             pretends.
             'Jan does not suspect that he has cancer, he is only pretending.'
             ⇏ Jan has cancer.

In contrast, after putting stress on the complement sentence, neither the knowledge of the speaker (controller) nor the knowledge of Jan are presupposed. Consider (290), the non-factive counterpart to (286).

(290)   Jan   podejrzewa,   że   ma   RAka.
             Jan   suspects.IPFV   that   has   cancer
             'Jan suspects that he has cancer.'
             Adapted from ibid., 57

(290) leaves open the question of whether Jan has cancer. As Danielewiczowa (2002: 58) puts it, we can easily test for this contrast. While we cannot say:

(291)   #   Jan   podejRZEwa,   że   ma   raka,   ale   ja   sądzę,   że
                  Jan   suspects.IPFV   that   has   cancer   but   I   think   that
                  to   jest   coś   innego.
                  it   is   something   else.
                  'Jan suspects that he has cancer, but I think that it is something else.'

uttering

(292)   Jan   podejrzewa,   że   ma   RAka,   ale   ja   sądzę,   że   to   jest
             coś   innego.
             'Jan suspects that he has cancer, but I think that it is something else.'

does not lead to a contradiction. Danielewiczowa assumes that differences in meaning caused by prosodic features are semantic in nature because of the presence of nonequal components of content in the two variants (= the presence or absence of the presupposition of the kontroler-nadawca's knowledge that the particular state of affairs holds). She further claims that the factivity-based opposition cannot be explained via the thematic-rhematic information ordering or via any pragmatic rule (ibid., 61). Therefore, she assumes the presence of two distinct units; e.g. for 'suspect': *podejrzewać* and *podejRZEwać*. The same pattern applies to *wydawać się* 'seem' (adapted from ibid., 189):

(293) Janowi wydaje się, że ktoś za nim idzie.
Jan.DAT seems.IPFV REFL that somebody behind him walks
To może być prawda.
It can be truth
'It seems to Jan that somebody is following him. It may be true.'

(294) Janowi wyDAje się tylko, że ktoś za nim
Jan.DAT seems.IPFV REFL only that somebody behind him
idzie. On jest taki nerwowy.
walks He is so nervous
'It only seems to Jan that somebody is following him. He is so nervous.'

(295) Janowi wyDAje się, że ktoś za nim idzie.
Jan.DAT seems.IPFV REFL that somebody behind him walks
To może być prawda.
it can be truth
'It seems to Jan that somebody is following him. It may be true.'

Based on the above observations, Danielewiczowa considers two realizations of 'it seems [to somebody] that': *wydaje się [komuś], że* i *wyDAje się [komuś], że*. See also the following contradiction:

(296) # WyDAje się, że mógł się pomylić.
seems.IPFV REFL that could REFL be.wrong
'It seems that he could be wrong.'

To sum up, we can observe systematic prosody-based oppositions within some imperfective epistemic verbs. Different prosodic patterns give rise to different semantic representations.

However, Danielewiczowa also points out that the relationship between the factivity of imperfective epistemic matrix verbs and the two distinct prosodic realizations (accenting an embedding predicate vs. accenting a propositional complement) needs to be considered a tendency and not an obligatory correlation; as we have already seen above, accenting an embedding predicate does not always result in its factive

interpretation (it does not for instance with *być pewnym*, *być przekonanym* 'be certain', *wierzyć* 'believe', etc.). In the case of *wierzyć*, the epistemic subject does not know if *p* holds (her knowledge is not enough to say whether it does). Its accented imperfective twin *WIErzyć* remains neutral with respect to factivity; by stressing the embedding verb, the subject emphasizes the fact of giving credence to the truth of someone's utterance, as in:

(297) WIErzę,   że   tego   nie   zrobiłeś.
        believe.1SG.IPFV   that   it.GEN   NEG   did.2SG
        'I believe that you did not do this.'
        Adapted from ibid., 242

In the following, I will discuss Danielewiczowa's view of the semantic structure of imperfective (non)factive verb pairs in Polish.

6.1.2   Semantic representations of imperfective (non)factive twins

Danielewiczowa proposes the following semantic representations of the non-factive *podejrzewać* (298) and the factive *podejRZEwać* 'suspect' (299):

(298) *a* podejrzewa, że *p* [akcent na propozycji] [33] Danielewiczowa (2002: 284)
    [T] *a*,
    [TD] który   (i) o *p* z {*p*, ¬*p*} wie, że jeśli *p*ˇ[34], to pod pewnym względem źle, że
                    *p*ˇ,
               (ii) nie wie, czy *p*ˇ zachodzi,
    [R] jest gotów (r.i)   ze względu na to, co wie, powiedzieć, że *p*ˇ,
                (r.ii) powiedzieć że jeśli *p*ˇ, to ktoś nie chce, żeby *a* wiedział,
                     że *p*ˇ.
    a suspects that *p* [accent on a propositional complement][35]
    [T] *a*,
    [TD] who   (i) about *p* from {*p*, ¬*p*} knows that if *p*ˇ, than it is under certain
                 circumstances bad that *p*ˇ,
            (ii)does not know if *p*ˇ holds,
    [R] is ready (r.i),   on account of what she knows, to say that *p*ˇ,
              (r.ii) to say that if *p*ˇ, then someone does not want *a* to know that
                  *p*ˇ.

Starting from the top, **[T]** stands for 'theme' (as a part of the theme-rheme opposition), and **a** represents an epistemic subject. **[TD]** is the so-called **dictum tematyczne**

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[33] I slightly modified the notational conventions.

[34] *P*ˇ represents an element from the pair {*p*, ¬*p*}, which undergoes a negative evaluation, cf. Danielewiczowa (2002: 284).

[35] The English translations are my own.

'thematic dictum' that describes the presupposed components of meaning, i.e. the parts of an utterance that remain true under negation. (298) includes two presuppositions: (i) a's readiness to negatively judge $p\breve{}$ (and the lack of such readiness in the case of $\neg p\breve{}$), and (ii) a's lack of knowledge of whether $p\breve{}$ holds. The lack of readiness to negatively evaluate $\neg p\breve{}$ is bound to the readiness to evaluate $p\breve{}$ and $\neg p\breve{}$ contrary to each other. In particular, if we suspect that $p\breve{}$, then we do not suspect that $\neg p\breve{}$ (one can only suspect bad things). The speaker is also evaluating $p\breve{}$ negatively, which is covered by *a knows that ...*

[R] builds the last component of the semantic representation. It refers to the rhematic part of an utterance, i.e.the part that does not survive under negation. The rheme in (298) consists of a's readiness to say two things: a is ready, on account what she knows, to say (r.i) that $p\breve{}$, and to say (r.ii) that if $p\breve{}$ holds, then there is someone who does not want a to know that it does.[36]

Now consider (299) – the factive counterpart to the imperfective *suspect*:

(299) *a* podejRZEwa, że *p* [akcent na predykacie] (ibid., 285)
  [T] *a*,
  [TD] (i) który o $p\breve{}$ z $\{p, \neg p\}$ wie, że jeśli $p\breve{}$, to źle, że $p\breve{}$,
      (ii) o którym, ktoś, kto nie chce, żeby *a* wiedział, że $p\breve{}$ zachodzi, wie, że *a* nie wie, czy $p\breve{}$ zachodzi,
  [R] jest gotów ze względu na to, co wie, powiedzieć, że $p\breve{}$.
      a susPECTS that *p* [accent on a predicate]
      [T] *a*,
      [TD] (i) who about $p\breve{}$ from $\{p, \neg p\}$ knows that if $p\breve{}$, than it is bad that $p\breve{}$,
          (ii) about whom someone, who does not want *a* to know that $p\breve{}$ holds, knows that *a* does not know whether $p\breve{}$ holds,
      [R] is ready, on account of what she knows, to say that $p\breve{}$.

As mentioned above and based on Danielewiczowa (2002: 285), in the case of the factive 'suspect', the accent is obligatorily placed on the embedding verb. The main difference between the factive and the non-factive variant is that the former, but not the latter, presupposes someone's (but not the epistemic subject's) knowledge about the fact that $p\breve{}$ holds. Because this inference is a presupposition, it needs to be placed within [TD]. Furthermore, in the factive variant, it is presupposed that the controller wishes to keep $p\breve{}$ secret from the epistemic subject.

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[36] In my opinion, the last-mentioned point is not a necessary component of the rhematic representation. For instance, the sentence *Ida podejrzewa, że oblała egzamin* 'Ida suspects that she failed the test' can be uttered in a situation where the teacher has just begun to tell students their grades. Let's say that Liwia, Ida's friend, says the above sentence to Marek after Ida told her that she thinks she failed the test. In this case, there is no one who does not want Ida to know that $p\breve{}$ (if $p\breve{}$ holds). Similarly this applies to statements like *Sandra podejrzewa, że będzie padać* 'Sandra suspects that it is going to rain.'

A similar pattern can be found with *czuć* 'feel'. Compare the following examples, adapted from ibid., 203:

(300) Marysia czuje,   że   Janek   ją   lekceWAży,   ale   ona   jest
Marysia feels.IPFV   that Janek   her   disregards   but   she   is
przewrażliwiona.   Myślę,   że   się   myli.
oversensitive   think.1SG   that   REFL   be.wrong
'Marysia feels that Janek disregards her, but she is oversensitive. I think that she is wrong.'

(301) Marysia CZUje   (to),   że   Janek   ją   lekceWAży,   # ale
Marysia feels.IPFV   it.ACC   that Janek   her   disregards   but
myślę,   że   się   myli.
think.1SG   that   REFL   be.wrong
'Marysia feels the fact that Janek disregards her, but I think that she is wrong.'

(302) Marysia   nie   czuje,   żeby   Janek   ją   lekceWAżył.
Marysia   NEG   feels.IPFV   that.BY   Janek   her   disregarded
Może   i   ma   rację.
Maybe   and   has   right
'Marysia does not feel that Janek disregards her {subjunctive mood}. Maybe she is right.'

(303) Tylko   Marysia   nie   CZUje   tego,   że   Janek   ją
only   Marysia   NEG   feels.IPFV   it.GEN   that   Janek   her
lekceWAży.
disregards
'Marysia is the only one who does not realize the fact that Janek disregards her.'

The above-mentioned correlation between factive accented and non-factive non-accented 'feel' applies to the majority of cases. However, truth-presupposition can be canceled if an appropriate context is provided. This raises the question as to whether the inference is a presupposition at all. It might be givenness, which can, but does not have to correlate with factivity. Consider (304).

(304) Przez   lata   naprawdę   CZUłam,   że   Krzysiek   mnie
through   years   really   felt.1SG.IPFV   that   Krzysiek   me
zostawi   i   w   końcu   popadłam   w   paranoję.   Sama
leaves   and   in   the.end   felt   into   paranoia   myself
od   niego   odeszłam.
from   him   left
'I was really feeling for years that Krzysiek was going to leave me, and I finally became paranoid about that. It was me who left.'

Two open issues remain. First, the assumption that two different semantic representations for verbs with prosody-based truth-related differences in meaning is only reasonable if the non-accented non-factive variant is considered a basis from which the factive twin is derived. Since we need an additional mechanism in order to receive the factive interpretation of the imperfective (putting stress on the matrix verb), and since the inference itself, limited to a small number of verbs anyway, vanishes under contrast, treating (non)factive twins as completely independent units seems exaggerated. Second, in cases like (297), there seems to be a weak truth-implicature. The speaker has a certain opinion about the epistemic subject and takes for granted the truth of what she has said (also if there is no proof, that means there is no veridicality in the proper sense). The combination of the above-mentioned factors suggests the presence of the prosody-based truth-implicature of the imperfective; putting stress on the matrix verb can give rise to the verb's factive or reliability- / commitment-based interpretation (Cohen & Krifka 2014, Krifka 2015). More precisely, factivity and reliability are possible realizations of the truth-implicature of the imperfective.

In the next subsection, I will discuss the notion of the so called **factual imperfective**.

6.2　The factual imperfective

Grønn (2003) investigates the usages of the imperfective aspect in Russian, where the imperfective past refers to complete events. This so called **factual imperfective** fulfills the function that is usually reserved for the perfective. Consider examples (305) and (306), adapted from Grønn (2003: 10):

> (305) Vanja čital.IPFV 'Vojnu i mir.'
> Vanja **was reading** 'War and Peace'. (Processual Ipfv)
> Or
> Vanja **has read** 'War and Peace'. (Factual Ipfv)

> (306) Vanja pročital.PFV 'Vojnu i mir.'
> Vanja **(has) read** 'War and Peace'.

The same observation holds for Polish:

> (307) Janek czytał.IPFV 'Wojnę i pokój.'
> Janek **was reading** 'War and Peace'. (Processual Ipfv)
> Or
> Janek **has read** 'War and Peace'. (Factual Ipfv)

> (308) Janek przeczytał.PFV 'Wojnę i pokój.'
> Janek **(has) read** 'War and Peace'.

Grønn proposes that the factual imperfective refers to complete events while either asserting or presupposing the actual existence of the state of affairs denoted by the verbal predicate (existential vs. presuppositional imperfective).

The presuppositional imperfective is restricted to past tense. Consider the Russian example (309), adapted from Grønn (2003: 153):

(309) A deti kričali.IPFV: papa, papa! … Za čto on umer.PFV? Tovariṧči, no počemu že ko mne? Pri čem tut ja? Ja, čto li, **ubival**.IPFV? (Uppsala Corpus)
'And the children cried out: Dad, dad … Why did he die? Well, my friends, why do you ask me? I have nothing to do with it. **Did I kill him**?'

The imperfective *ubival* 'killed' is licensed in (309), because the event of killing is presupposed based on / easily inferable from the perfective-marked complete event of dying described in the previous utterance. The location in the past also belongs to the presupposed material; the existence of a killing event is given, therefore killing itself is not the focus of attention. Grønn assumes that presupposing the existence of an event means knowing of its existence.

However, using the imperfective with the perfective meaning is much more restricted in Polish than in Russian. Consider (310) – the Polish counterpart of (309)[37]:

(310) A dzieci krzyczały.IPFV: tato, tato! … Dlaczego on umarł.PFV? Kochani, dlaczego mnie pytacie? Ja nie mam z tym nic wspólnego. Czy to ja go **zabiłem**.PFV / ***zabijałem**.IPFV?

Only the perfective 'kill' can be used in (310), despite the presence of the presupposition of the dying event.

Another interesting case is illustrated in the Russian example (311). It is an instance of the existential imperfective of the so-called **experiential** sort (adapted from Padučeva 1996: 39, cf. also Grønn 2003, Mueller-Reichau 2018).

(311) Sergej vešal.IPFV ètu kartu. On znaet kak èto delaetsja.
'Sergej (once) put up this map. He knows how to do it.'

According to Mueller-Reichau (2018: 217), the following processing path is involved in understanding (311). There is an utterance situation where the hearer has problems with putting up a certain map. The speaker is not able to help, but she knows of someone – Sergej – who might be able to. The speaker believes that Sergej is an appropriate choice, because she knows that he has already put up this particular map. The speaker's

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[37] The translation is my own.

conclusion is driven by the trivial rule of common sense reasoning illustrated in (312); Mueller-Reichau ibid.

(312)   i. Background rule: If someone does something, she will then know how to do it.
ii. Event: Sergej put up this map.
iii. Conclusion: Sergej knows how to put up this map.

In line with Mueller-Reichau, the existential imperfective is immediately followed by a sentence explicating the proposition that is implicitly asserted by the imperfective aspect. In (311), that proposition states that Sergej is the one who knows how to put up the map.

(311) works also for Polish, but only after providing an explicit temporal indication:

(313)   Sergej wieszał.IPFV <u>już kiedyś</u> / <u>ostatnio</u> ten obraz. On wie jak to zrobić.
'Sergej put up this map (some time) in the past / recently. He knows how to do it.'

In general, using the imperfective in the perfective domain in Polish is possible in the following two scenarios: first, if the utterance focuses on the duration of an event, as in (314):

(314)   Rastrelli budował.IPFV Pałac Zimowy aż osiem lat, ...
'Rastrelli was building the Winter Palace for eight years, …'

(314) could be followed by both (315) and (316):

(315)   ale nigdy go nie skończył.
'but he never finished it.'

(316)   ale jak Państwo widzicie, opłacało się.
'but as you can see, it was worth it.'

(315) illustrates the typical use of the imperfective, i.e. the expression of the non-completion of the building event. Judging (314) as non-compatible with (315) is based on our world knowledge, and not on any aspectual/semantic conflicts within an utterance. We know that Rastrelli built the Winter Palace in 1762, so we also know that the building process was completed. Using the imperfective makes it possible to focus on the duration (meaning that it took a long time to build the Palace), and not on the completion itself; for that reason, (316) is a perfect continuation of (314).

Alternatively, the meaning of (314) could also be expressed with the perfective 'build':

(317)   Rastrelli zbudował.PFV Pałac Zimowy w osiem lat.
        'Rastrelli built the Winter Palace within eight years.'

In (317), there is no emphasis on the long duration of the building process (in contrast to (314), so the sentence could mean that it was built quickly).

Second, the imperfective can occur in the perfective domain in Polish if the speaker aims at indicating a particular modal or causal interpretation of a (complete) event:

(318)   Matejko malował.IPFV te obrazy ku pokrzepieniu serc.
        'Matejko was painting those {finished} paintings to raise people's spirits.'

Without a specific indication (temporal, modal, causal), the imperfective form would appear unnatural in all the abovementioned examples.

In the following chapter, I will present cross-linguistic evidence for the relationship between perfectivity and factivity.

7 Cross-linguistic evidence for the interaction between perfectivity and truthfulness

7.1 Hungarian

7.1.1 Factivity of perfective verbs of communication

Hungarian is a Uralic SVO language with an agglutinative morphology (cf. Eberhard et al. 2019). In this language, aspect is not grammaticalized; verbal stems are neither systematically nor obligatorily marked as (im)perfective. However, some 'semantically imperfective verbs' (i.e. verbs that have an on-going, unlimited interpretation) can be perfectivized by means of the perfective particles *meg-* and *be-*.

It was pointed out by Kiefer (1986) that, in Hungarian, certain verbs of communication have a factive and a non-factive variant. Consider the following examples, adapted from Kiefer (1986: 202).

> (319) Péter **mondta** / **írta**, hogy Anna beteg.
> 'Peter **said.IPFV** / **wrote.IPFV** that Anna was sick.'
> i.   The speaker does not commit herself to the truth of the proposition 'Anna is sick.'
> ii.   ↛ Anna is sick.

> (320) Péter **megmondta** / **megírta**, hogy Anna beteg.
> 'Peter **said.PFV** / **wrote.PFV** that Anna was sick.'
> i.   The speaker takes the proposition 'Anna is sick' for granted.
> ii.   → Anna is sick.

As examples (319) and (320) illustrate, we can build (im)perfective minimal pairs *mond – meg-mond* 'say' and *ír – meg-ír* 'write'. The respective embedded that-clauses differ only in factivity. Whereas the first member of each pair mentioned above embeds propositions that are neutral with respect to truthfulness, the second member embeds only true propositions. As has already been mentioned, Kiefer calls the (im)perfective variants (non)factive, on the basis of inference patterns presented in (319) and (320). In line with the terminology adapted in my dissertation, the perfective derivates in (320), in contrast to the imperfective underlying forms in (319), exhibit the veridical meaning of the subordinate clause. Only the observation that the truth-inference survives under negation confirms the factivity status of the perfective. See (322), compared to the imperfective (321).[38]

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[38] I would like to thank Kata Wohlmuth for her judgements on Hungarian and for fruitful discussions. All remaining errors are my own.

(321)   Péter **nem mondta** / **nem írta**, hogy Anna   beteg.
'Peter was **not saying / writing** that Anna was sick.'
↛ Anna is sick.

(322)   Péter **nem mondta meg** / **nem írta meg**,
hogy   Anna   beteg.
'Peter **did not say / write** that Anna was sick.'
→ Anna is sick.

Kiefer can be seen as a pioneer of the observation on perfectivity-dependent factivity realized on propositional complements:

"It is generally known that perfective verbs are often used to report on facts whereas imperfective verbs are used to describe ongoing processes or activities. This may explain why *megmond* 'say (perfective)' and *megír* 'write (perfective)' are factive whereas *mond* 'say (imperfective)' and *ír* 'write (imperfective)' are not. This does not mean, however, that all perfective verbs are automatically factive (of course, they are not). The majority of factives seem to be statives, they describe states and are consequently neither perfective nor imperfective. **This may mean, however, that whenever we have an imperfective-perfective pair such as *mond-megmond*, *ír-megír* which may take an embedded that-clause, in addition to the difference concerning perfectivity there might also be a difference concerning factivity between the two verbs, the perfective verb being factive and the imperfective one nonfactive**." (Kiefer 1986: 203–204).

By means of the (at first sight unusual) factive meaning of propositions embedded under perfective verbs of communication, Hungarian seems to make a systematic distinction between reported facts and reported utterances/statements.

To conclude, the perfective *meg-* functions as a factivity-trigger when applied to verbs of communication cf. (323).

(323)   [[*meg-* V$_{COMM}$] [that …]] → *p* is true, also under negation; V is factive

Another observation that confirms the factivity of perfective communication verbs in Hungarian comes from embedding of propositions that are known to be false. Consider the following example.

(324)   Many people have claimed that the earth was flat.
i.   Homer *azt #megmondta / mondta* that the earth was flat.
ii.   Thales *azt #megmondta / mondta* that the earth was flat.
iii.   Leucippus *azt #megmondta / mondta* that the earth was flat.
'Homer / Thales / Leucippus said.PFV / said.IPFV that the earth was flat.'

Since it is part of common knowledge that the earth is round, i.e. that the proposition from the subordinate clauses in (324) does not hold in the actual world, it can only be

embedded by the imperfective 'say'. This means that, as presented in (324), discourse-givenness does not influence the projection pattern. In the above example, p is introduced in the beginning (in the sense that p has been claimed before), and the utterances i.–iii. focus on the subjects (who were the people that said that p). If factivity was a side-effect of givenness, one would expect the sentences i.–iii. to be well-formed under the perfective 'say'. The fact that they are not suggests that factivity originates from / is bound to actualization.

7.1.2 Veridicality of perfective incremental theme verbs

A very interesting phenomenon can be observed in incremental theme verbs / reveal-type predicates in Hungarian. In the case of 'to prove', the perfective particle *be-* needs to be used in order to get truth-entailment.

(325)   Péter **bebizonyította**, hogy Anna beteg.
'Peter **proved.PFV** (it right) that Anna was sick.'
→ Anna is sick.

Crucially, there is no imperfective version of (325), i.e. it is not possible to remove the particle and, as a result, to get rid of the entailment. The only way to use the verb 'to prove' is with *be-*, and with a veridical meaning of a complement sentence. This fact might arise from the lexical content of 'proof'; if something is a proof, it cannot be wrong. There can be a potential proof that has not been accepted in the course of verification or some piece of evidence that is not sufficient to establish a proof, but everything that is acknowledged as a proof causes a veridical interpretation of a proposition.

If we want to express the meaning 'to be proving', we have to use a conative construction based on 'to try to prove'. Consider (326) for the imperfective, and (327) for the perfective version of that construction.

(326)   Péter **próbálta bebizonyítani**, hogy Anna beteg,
de végül **nem bizonyította be**.
'Peter **tried.IPFV** to **prove.PFV** that Ann was sick, but he did **not prove** it in the end **PFV**.'
↛ Anna is sick.

(327)   Péter **megpróbálta bebizonyítani**, hogy Anna beteg,
de végül **nem bizonyította be**.
'Peter **tried.PFV** to **prove.PFV** that Ann was sick, but he did **not prove** it in the end **PFV**.'
↛ Anna is sick.

There is an implicature-based difference between (326) and (327). With the imperfective variant (326), it seems improbable that Anna is sick. After using the

perfective, however, the proposition expressed by the that-clause is more likely to be interpreted as true. Since both (326) and (327) can be followed by *but he did not prove it in the end*, there is no entailment in the case of the perfective. A weak truth-inference might be an implicature.

Based on this subsection, we can assume the following.

(328) [[*be-* V$_{\text{PROVE}}$] [that …]] $\rightarrow p$ is true, but not under negation; V is veridical

(329) [[*meg-* V$_{\text{TRY}}$] [that …]] $\rightarrow p$ is likely to be interpreted as true

To sum up, the perfective tends to trigger truthfulness in Hungarian. Truthfulness can be realized as factivity (verbs of communication), veridicality (an incremental 'to prove') or a weak truth-implicature ('to try'). General aspect-related differences in truthfulness are presented in (330) and (331).

(330) [[V.PFV] [that …]] $\rightarrow p$ is true

(331) [[V.IPFV] [that …]] $\rightarrow p$ is neutral with respect to truthfulness

Specific parametrizations of the perfective within each analyzed verb group are illustrated in (332), (333) and (334).

(332) [[V$_{\text{COMM}}$.PFV] [that …]] $\rightarrow$ truth-presupposition on p (p is true, also under negation)

(333) **[[V$_{\text{PROVE}}$.PFV] [that …]] $\rightarrow$ truth-entailment on p**

(334) [[V$_{\text{TRY}}$.PFV] [that …]] $\rightarrow$ truth-implicature on p

Crucially, the three types of truth-inference observed in Hungarian correspond to the inference types described for Polish. The only difference between the two languages lies in the distribution of the inference types over diverse semantic groups of verbs. There is, however, one case of a 1:1 relationship between verb class and inference type. In both languages, perfective verbs of proving (incremental theme verbs) yield truth-entailment. This suggests the cross-linguistic (or universal) role of incrementality in triggering veridicality. Furthermore, it speaks in favor of the development of an account that would explain the correlation: [+ perfective] + [+ incremental] = [+ veridical].

In the next subsection, I will discuss perfectivity-dependent truthfulness arising from ability modals in Hindi and French.

7.2   Modal constructions in Hindi, Greek and French

7.2.1   Actuality entailment

In this section, I will investigate cases where aspect is marked on modals, and where the perfectivity-truthfulness dependency remains.

7.2.1.1   Hindi

Hindi is an SOV Indo-Aryan language that marks both tense and aspect (cf. for instance Eberhard et al. 2019). In line with Koul (2008: 105), there are three grammatical aspect types in Hindi: habitual, progressive and perfective (recall also the concept of the 'two perfectives' described by Singh 1998 and Arunachalam & Kothari 2011 that was mentioned in section 4.1).

The influence of perfective ability modals on a factive interpretation of complement clauses was discovered by Bhatt (1999). Bhatt discusses the presence of the so-called **actuality entailment** in languages like Hindi or Greek.

Actuality entailment refers to the non-cancelable inference stating that the proposition expressed by the complement clause holds in the actual world. I will use the term **actuality entailment** only with regard to the truth-inference triggered by modal verbs or modal constructions. The phenomenon itself seems to be equivalent to the truth-entailment (veridicality) described in this dissertation. As a result of the actuality / truth-entailment, an embedded proposition is to be taken for granted if the matrix verb appears in the affirmative form. I am using the terms 'truth-entailment' and 'veridicality' (instead of 'actuality'), because they do not base on actualization. I prefer to define truth-inferences via the verification in the world of evaluation.

Example (336) illustrates that the perfective variant of the Hindi sentence *Yusuf could fly the airplane* entails that Yusuf did in fact fly the airplane. The continuation with *but he did not fly the airplane* causes a contradiction. The respective imperfective form lacks this inference, which can be seen in (335).[39]

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[39] Examples (335) and (336) indicate a correlation between perfectivity and definiteness on the nominal level, and between perfectivity and truthfulness on the sentential one (i.e. the relationship between definiteness and factivity in a broader sense); cf. also Bhatt (1999: 174) for the existential interpretation of indefinite subjects embedded under the 'manage to'-reading (the perfective reading) of ability modals, and the generic interpretation of indefinite subjects embedded under the 'had the ability to'-reading (the imperfective reading) of these modals.

(335) Yusuf havaii-jahaaz **uṛaa sak-taa** hai/thaa
       Yusuf air-ship **fly can-IPFV** be.PRS/be.PST
       (lekin vo havaii-jahaaz **nahĩĩ uṛaa-taa** hai/thaa).
       but he air-ship **NEG fly-IPFV** be.PRS/be.PST
       'Yusuf is/was able to fly airplanes but he doesn't/didn't fly airplanes.'
       Adapted from: Bhatt (1999: 176)

(336) Yusuf havaii-jahaaz **uṛaa sak-aa**
       Yusuf air-ship **fly can-PFV**
       (# lekin us-ne havaii-jahaaz **nahĩĩ uṛaa-yaa**).
       but he-ERG air-ship **NEG fly-PFV**
       'Yusuf could fly the airplane, but he didn't fly the airplane.'
       Adapted from: Bhatt (1999: 176)

As further evidence, consider contradictions present in the following examples.

(337) # Yunus Yakub-kaa **tiin baar khoon** kar **sak-aa**.
          Yunus Yakub-GEN **3 times murder** do **can-PFV**
       'Yunus could murder Yakub three times/on three occasions.'
       Adapted from: Bhatt (1999: 176)

(338) # mE apne-aap-ko **maar sak-aa**.
          I self-ACC **kill can-PFV**
       'I could kill myself.'
       Adapted from: Bhatt (1999: 176)

Since the perfective 'can' enforces a clausal argument to hold, we cannot have multiple instantiations of a perfective murdering-event. Furthermore, if the subject could.PFV kill herself, she cannot be the sentence speaker anymore.

In this subsection we saw that, perfective ability modals in Hindi, in contrast to their imperfective counterparts, trigger truthfulness of the complement sentences.

7.2.1.2 Greek

A similar pattern holds for Greek. Greek is an Indo-European SVO language that has the so-called **aorist** (perfective past) and a rich aspectual system in general, cf. Smyth (1984), Eberhard et al. (2019). Consider examples (339) and (340).

(339) **Borusa** na **sikoso** afto to trapezi
       can.IPFV.1SG na **lift.NON-PST-PFV.1SG** this the table
       ala **δen** to **sikosa**.
       but **NEG** it **lift.IPFV**
       '(In those days), I could lift this table, but I didn't lift it.'
       Adapted from: Bhatt (1999: 175)

(340)　　**Boresa**　　　　na　tu　　**miliso**
　　　　　can.PST-PFV.1SG　na　him　**talk.NON-PST-PFV.1SG**
　　　　　(#　ala　**δen**　tu　　**milisa**).
　　　　　　　but　NEG　him　**talk.PST-PFV**
　　　　　'I was able to talk to John (but I did not talk to him).'
　　　　　Adapted from: Bhatt (1999: 175)

As examples (339) and (340) demonstrate, only embedding by the imperfective ability modal allows for the complement sentence not to hold in the actual world (or to be neutral with respect to truthfulness). Following Bhatt (1999: 175), the presence of the perfectivity-bound actuality entailment in Greek can further be confirmed via the contradiction of (341) and (342).

(341)　　#　O　　Yanis　**borese**　　na　**skotosi**　　　　ton
　　　　　　　the　Yanis　**can.PST-PFV**　na　**kill.NON-PST-PFV**　the
　　　　　　　Petro　**3**　**fores**.
　　　　　　　Petro　**3**　**times**
　　　　　　　'Yanis managed to kill Petro three times.'
　　　　　　　Adapted from: Bhatt (1999: 175)

(342)　　#　**Boresa**　　　　na　**aftoktoniso**.
　　　　　　　can.PST-PFV　na　**kill-self**
　　　　　　　'I managed to kill myself.'
　　　　　　　Adapted from: Bhatt (1999: 176)

Crucially, the contradiction vanishes if 'kill' is marked for the imperfective aspect. The imperfective variants of (341) and (342) would mean something like 'On three occasions, John could have killed Peter' and 'I could have killed myself', respectively (Bhatt 1999: 175).

7.2.1.3   Generalization for languages that mark aspect on ability modals

In line with Bhatt (1999: 177), the following pattern holds for languages that mark aspect on ability modals:

(343)　　　a.　PST (PFV(can) [VP]) = ***managed-to***
　　　　　　b.　PST (IPFV(can) [VP]) = ***had-ability-to***
　　　　　　Adapted from: Bhatt (1999: 177)

The derivation of the actuality entailment is presented in (344).

(344)　　　ABLE$_{STATIVE}$ (P)(x) + [+ bounded] $\leftrightarrow$ P(x) (Actuality Entailment)
　　　　　　Adapted from: Bhatt (1999: 183)

Following Bhatt (1999: 183), the absence of the [+ bounded] feature gives rise to the standard ability attribution. As a consequence, if a language parametrizes the [+ bounded] feature by the perfective aspect, the resulting perfective ability modal yields actuality entailment. In contrast, since the imperfective lacks the [+ bounded] feature by default, imperfective ability modals do not yield actuality entailment. This shows that it is in fact the standard semantics of perfectivity that is responsible for the truth-entailment of perfective ability modals.

However, assuming that 'able' is a stative is not unproblematic. For instance in Greek, perfectivizing imperfective states gives rise to an inchoative interpretation of a derivate (Bhatt 1999: 184). Consider the following example.

(345)   O   Jannis agapise   tin   Maria   to   1981.
          the   Jannis love-PST-PFV-3SG   the   Maria   in   1981
          'John started loving/fell in love with Mary in 1981.'
          Adapted from: Anagnostopoulou et al. (1998)

For that reason, Bhatt (1999: 184) proposes treating 'able to' as a non-stative implicative verb that has a conventional implicature similar to 'manage to'. Under this assumption, actuality entailment of perfective ability verbs used in the past tense in Hindi, Greek, Bulgarian or Catalan, and of the past episodic readings of the English *to manage to* results from the implicative character of these verbs. The evaluation of the proposition embedded under an implicative verb happens via realization of the matrix tense feature:

(346)   John managed to eat the pizza. → John ate the pizza.
          Bhatt (1999: 184)

In this proposal, the standard ability attribution reading of 'to be able to 'is derived by means of the GEN operator:

(347)   a.   (In those days,) A fireman was able to eat five apples.
             LF: PST (GEN (able(eat-5-apples)) (fireman))
         b.   A fireman is able to eat five apples.
             GEN ((able(eat-5-apples)) (fireman))
             Adapted from: Bhatt (1999: 185)

The problem with Bhatt's account lies in the fact that, in some languages (for instance in French), the same lexeme is a basic for both an ability and an epistemic interpretation of a given modal. As will be shown later, in French, epistemic perfective modals do not yield an entailment though. This is why assuming an implicative meaning as a default would require some additional assumptions.

In the next subsection, I will briefly discuss French data that further confirm the truth-related potential of (some) perfective modal constructions.

7.2.1.4 French

In line with Smith (1991: 253) among others, the aspectual viewpoint in French is expressed via tense. We can have a perfective, an imperfective, and a neutral perspective on events. However, the choice between perfective and imperfective (i.e. the building of aspectual minimal pairs) is only available in the past tense. In other tenses, the particular forms encode either the neutral or the perfective perspective.

Hacquard (2006) investigated possible truth-inferences of some French modal verbs marked for the perfective aspect. Consider the following examples, where actuality entailment is present with the perfective ability modal, and absent with its imperfective counterpart.

> (348) Pour aller au zoo, Jane **pouvait** prendre le train
> (but she went there by bike / but she did not go to the zoo at all).
> 'To go to the zoo, Jane **can-PST-IPFV** take the train.'
> Adapted from: Hacquard (2006: 13)

> (349) Pour aller au zoo, Jane **a pu** prendre le train
> (#   but she did not take the train /   #   but she went there by bike).
> 'To go to the zoo, Jane **can-PST-PFV** take the train.'
> Adapted from: Hacquard (2006: 13)

The interpretation of (348) is such that, within all accessible worlds, there is a world in which Jane 1): goes to the zoo, and 2): arrived there by train. Crucially, this is not contradictory to a scenario where Jane neither took a train in the actual world nor went to the zoo at all. In contrast, in (349), Jane did necessarily take the train in reality. The sentence cannot be followed by any utterance stating that she did not take the train in the end (Hacquard 2006: 13).

Interestingly, actuality entailment is not restricted to perfective ability modals; it also occurs with the perfective 'must':

> (350) Pour aller au zoo, Jane **devait** prendre le train
> (but she did not take the train).
> 'To go to the zoo, Jane **must-PST-IPFV** take the train.'
> Adapted from: Hacquard (2006: 14)

> (351) Pour aller au zoo, Jane **a dû** prendre le train
> (#   but she did not take the train).
> 'To go to the zoo, Jane **must-PST-PFV** take the train.'
> Adapted from: Hacquard (2006: 14)

By analogy to the previous examples, the imperfective 'must' in (350) does not require its complement to hold in the actual world, whereas the perfective one in (351) enforces the truth of an embedded proposition. The only difference between (349) and (351) lies

in the modal-bound component of meaning: While (349) denotes an actualized possibility, (351) expresses an actualized necessity. In the former case, there might have been several options for getting to the zoo, and it was Jane's preference to take the train. In the latter case, however, taking the train was the only option available (Hacquard 2006: 14).

7.2.2 Actuality implicature

Hacquard (2006: 16) shows that the perfectivity-dependent truth-inference in French is not always an entailment. (352) and (353) constitute a minimal pair that consists of the imperfective (in the former case) and the perfective (in the latter case) version of the (modal) construction 'to have the possibility'. Although the perfective variant strongly suggests that Darcy did meet Lizzie in the actual world (especially in direct comparison with the imperfective alternative), we can negate that state of affairs without giving rise to a contradiction.

> (352)   Darcy **avait** la possibilité de rencontrer Lizzie
> (but he did not meet her in the end).
> 'Darcy **had-IPFV** the possibility to meet Lizzie.'
> Adapted from: Hacquard (2006: 16)

> (353)   Darcy **a eu** la possibilité de rencontrer Lizzie
> (but he did not meet her in the end).
> 'Darcy **had-PFV** the possibility to meet Lizzie.'
> Adapted from: Hacquard (2006: 16)

Hacquard further notices that, since the meaning of the French 'have the possibility' is very similar to the meaning of the ability modal, one would expect the same inference pattern in (349) and (353) if the differences in interpretation between the (im)perfective forms were due to some pragmatic aspects of 'possibility'. Instead, the presence of a clearly semantic inference in (349) and 'only' a pragmatic enrichment in (353) suggest that it is rather the syntax / semantics of the modal that triggers the entailment.

Anyhow, what is crucial for the purpose of this dissertation is that data from French provide further cross-linguistic evidence for the relationship between perfectivity and truthfulness.

In the next subsection, I will briefly discuss Hacquard's explanation of the perfectivity-veridicality dependency in French modal constructions.

7.2.3 Hacquard's explanation

The background for the proposal is based on the observation that not all perfective modals in French require actuality of their complements. For instance, epistemic interpretations of the above-described 'can'/'must' do not yield actuality entailment

independently of aspect. Consider the following examples, adapted from Hacquard (2006: 24).

(354)   Darcy **a pu**   aimer   Lizzie.
         Darcy **could-PFV**   love   Lizzie
         'Darcy could have loved Lizzie.'

(355)   Darcy **pouvait**   aimer   Lizzie.
         Darcy **could-IPFV**   love   Lizzie
         'Darcy could have been in love with Lizzie'.

(356)   Darcy **a dû**   aimer   Lizzie.
         Darcy **must-PFV**   love   Lizzie
         'Darcy must have loved Lizzie.'

(357)   Darcy **devait**   aimer   Lizzie.
         Darcy **must-IPFV**   love   Lizzie
         'Darcy must have been in love with Lizzie'.

Following Hacquard (2006: 24), examples (354)–(357) do not differ with respect to the truth-related meaning of their complement sentences. This results from the fact that, in these cases, aspect is interpreted below the modal. In both the perfective and the imperfective variants, the speaker makes an assertion as to what could or must have been the case at the reference past time; the speaker's assumptions are based on the state of her knowledge at the time of utterance. In the perfective (354) and (356), the proposition (Darcy(love(Lizzie))) held at some point in the past, but it no longer holds at the speech time. In contrast, in the imperfective (355) and (357), it is left open whether the proposition still holds at the time of utterance.

This shows that ability modals pattern differently from epistemic modals regarding the presence or absence of actuality entailment. Interestingly, deontic modals that express permission or obligation belong either to the first or to the second group. If the obligation lies with the addressee, there is no actuality entailment, and the modal can only be marked for the imperfective aspect. If the obligation lies with the subject, however, actuality entailment appears with the perfective.

According to Hacquard (2006: 147), actuality entailment is obligatory in cases where the perfective aspect scopes over a modal; if ASPECT is parametrized by [+ PERFECTIVE] and occurs in a matrix environment by scoping over a modal, its world argument is realized by the actual world, and, as a consequence, provides an actual event, cf. Hacquard (2006: 200). In this line of reasoning, perfective subject-related deontic modal verbs like the one in (358) (the so-called **goal-oriented modals**, cf. Fintel & Iatridou 2005) that likewise yield actuality entailment would also allow aspect raising. In (358),

modality is relativized to the subject (the obligation lies with Kitty), and a circumstantial accessibility relation arises.

> (358) Kitty **a dû** faire ses devoirs
> 'Kitty **must-PFV** do her homework.'[40]
> (so that she would be allowed to go out at night).
> (#but she didn't do it/and she did it).
> Adapted from: Hacquard (2006: 122).

However, if (358) had an addressee-oriented interpretation (if one addressed the babysitter that is supposed to make sure that Kitty gets her homework done), the perfective aspect could not be used regardless of whether the proposition from the embedded clause holds in the actual world or not.

In line with Hacquard, this suggests that epistemics and addressee-oriented deontics, in contrast to subject-oriented deontics and ability modals, are evaluated at the utterance time and can only be interpreted above tense.

Consider also the English sentence (359), where (the only possible) epistemic interpretation of *must* comes about via the modal's evaluation at the speech time. The fact that the addressee-deontic reading is ruled out suggests that the deontic *must* can only be interpreted at the time of utterance.

> (359) Lydia must have gone to confession.
> Adapted from: Hacquard (2006: 122)

Following Ninan (2005) and Hacquard (2006: 123), example (359) triggers an epistemic interpretation, because it is conceptually well-formed to report about current epistemic knowledge that concerns a past state of affairs. In contrast, it is not well-formed to bring about a past state of affairs.

Hacquard's account nicely explains the complementary distribution between subject-oriented deontic and ability modal verbs on the one hand (subsumed under the term **root modals**, cf. Kratzer 1981) and addressee-oriented deontic and epistemic modal verbs on the other with respect to enforcing the actual meaning of their complement sentences.

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[40] It needs to be pointed out that, in (358), the modal *devoir* occurs in its past participle form (with *a* representing the 'have'-auxiliary). The inferences described above remain the same when the modal is marked for the simple past and agrees with the third person, as in: *Kitty **dût** faire ses devoirs* 'Kitty **must-PST-PFV** do her homework.' (Paul Marty, p.c.). Furthermore, the continuation with 'and she did it' does not have to result in a contradiction; it gives rise to the interpretation 'Kitty was obliged to do her homework, and she fulfilled the duty by doing her homework' (Paul Marty, p.c.).

However, in order to explain the truth-entailment of perfective incremental theme verbs in Polish, it seems more promising to build on an account that focuses on propositional content and its nature rather than on distinctions in scope relations. Furthermore, the relationship between aspect and modality is beyond the scope of this dissertation; Polish modal verbs are not marked for aspect anyway.

Since the truth-entailment in Polish systematically occurs with perfective reveal-type predicates that represent different instances of verbs of proving, an incremental, complete vs. non-complete creation of proof should function as a basis for the derivation of the aspect-dependent veridicality. More precisely, I need a definition of 'proof' that assumes part structure of proof (cf. Schroeder-Heister 1991 for proof in logical systems). I will demonstrate that, if single pieces of evidence are sufficient to establish a proof, a truth-conditional object is revealed. The distinction between non-sufficient and sufficient amount of evidence provides a reasonable solution to the phenomenon in question.

Furthermore, the fact that one needs various ways of accounting for the relationship between aspect and truthfulness in different languages is not a problematic issue. We have already seen that the correlation itself is a cross-linguistic phenomenon. Variegated realizations of aspect-dependent truthfulness and its regularity depend for instance on the aspectual system in a language (grammaticalized as in Slavic languages, partly grammaticalized as in Hungarian, marked on modals as in French, etc.) and on the need for fulfillment of possible gaps. In general, it seems that, if a matrix verb is marked for the perfective aspect and embeds a propositional complement, one should expect the complement to be interpreted as true (no matter how 'strong' the inference emerges). This assumption holds especially for languages that enable embedding by both the perfective and the imperfective, i.e. the building of aspectual minimal pairs within the main clause.

In the next subsection, I will provide the last piece of evidence for the perfectivity-factivity dependency.

7.3 Imperfective aspect as a non-factivity trigger in Austronesian languages

I will concentrate on two languages spoken in Vanuatu: Daakaka and Mavea. In Daakaka and Mavea, one of the noncanonical functions of the imperfective markers is the expression of false beliefs and/or counterfactuality. This indicates the correlation between imperfectivity and non-factivity (and supports the binary distribution between the two aspects with respect to factivity); Prince (p.c.), see also Prince et al. (2018).

In the next two subsections, I will present data from the above-mentioned languages.

7.3.1 Daakaka

(360) Nye   na   **bwe**   **dimyane** kyun ka   ebya
          1s   1s   **REAL.CONT**   **want**   just MOD1   wing
          -ur   ka   we   pwer
          -1P.IN.POSS   MOD2   POT   stay
          'I just wish I had wings.'
          ref 4207
          (https://korpling.org/annis3/?id=f891e226-b0a7-4a10-9070-011ed9a6e036,
          04.02.19)
          MOD1=complementizer, CONT=continuous (marks imperfectivity), MOD2=assertive marker; otherwise the clause would be a directive, POT=potential

According to Prince (p.c.), the verb *dimyane* 'want' is inherently imperfective and usually occurs without aspectual marking. In (360), however, it appears that the continuous marker *bwe* indicates the counterfactuality of the embedded clause, or marks the difference between 'want' and 'wish'. In the closely-related neighboring language Dalkalaen, continuous markers appear consistently in past counterfactual clauses (Prince et al. 2018). While both languages have other ways to express counterfactuality, the imperfective seems to contribute to the counterfactual interpretation.

7.3.2 Mavea

Similar observation holds for Mavea, where the imperfective marker *lo-* combines with *duseia* 'think' only in case of false beliefs. Otherwise (and by default), *duseia* appears without *lo-*. There seem to be parallels to the English *think* vs. *thought*, with *duseia* representing the former, and *duseia + lo-* the latter (von Prince, p.c.).

(361) na-   **lo-**   **duseia** na-   -v   or   m̃atan   ma
          1SG-   **IPFV-** **think**   1SG- -say maybe because COMP
          mo-   sisi   mo-   evuia
          3SG-   dark   3SG-   finish
          'I thought maybe because it is dark that's it (I thought a fish had accidentally bumped into my leg, but it turned out to be a shark that attacked me.).'
          ref 06015.087
          (https://korpling.org/annis3/?id=740f51f5-a020-4dbd-b974-3e4083d55e4e,
          04.02.19)

In the following, I will present experimental evidence for the relationship between perfectivity and factivity in Polish.

8 Background for the empirical investigation on the interaction between perfectivity and factivity in Polish

In order to empirically verify the above-mentioned theoretical assumptions about the interaction between perfectivity and factivity in Polish, an acceptability judgement study was conducted.

8.1 Motivation for the acceptability judgement study

Using an acceptability judgement task turned out to be the most reasonable solution for detecting interpretative differences between perfective and imperfective aspect in Polish. Constructing two types of scenarios – a factive and a non-factive one (I will explain the difference between them in a further part of this chapter) provides an opportunity to directly address and investigate the interplay between (non)factivity and (im)perfectivity. The way of building experimental material ensured that the differences in acceptability could only be attributed to the factivity of the scenarios; the actual (im)perfective test sentences were minimal pairs differing only in aspect.

Another way to examine the factivity of the perfective would be to undertake a corpus-based investigation. In particular, one could analyze contexts that license the occurrence of the (im)perfective verb forms. If an embedded proposition is a fact or a statement that is considered to be true (which can be stated either on the basis of world knowledge, e.g.: *know / discover that <u>the earth is round</u>*, or on the basis of an explicit language context, e.g.: *know / discover that <u>Anna stole the cookie</u>*), and if an embedding verb is an attitude predicate, then we would expect the matrix verb to be marked for the perfective aspect. The problem with approaching my research question by means of a corpus-based analysis lies in the subjectivity of interpretation of the contexts and in the lack of clarity when it comes to comparability of results. We would need to specify as to when a context counts as factive. Furthermore, is it necessary to differentiate between instances that acknowledge something as a fact? For example, with respect to the act of proving, there could be a professor, a judge, a policeman, a friend, etc., who might fulfill the function of a verifier. Should we treat them all alike and assume that the entire responsibility for the factivity of the complement sentence lies with *prove* itself? Another problem with a corpus-based investigation concerns receiving enough data in order to draw any statistically significant conclusions. Every context needs to be analyzed manually, which makes it almost impossible to run a meaningful quantitative analysis. Moreover, we do not always know what people were thinking while using certain expressions.

A more suitable research question for a corpus-based analysis would, for instance, be an investigation of collocations: (im)perfective verb form vs. an occurrence of an anaphoric expression (*he guessed*.PFV */ guessed*.IPFV *it that Stefan is the culprit*). Anaphoric expressions make the propositions being interpreted discourse-given, and

discourse-given propositions tend to be taken for granted. For that reason, we would expect the relationship between perfectivity and anaphoricity (rather than between imperfectivity and anaphoricity). A quantitative corpus-based analysis could be conducted in order to verify this hypothesis.

In contrast to what was said about corpus-based investigations, an acceptability judgment experiment allows comparable contexts to be created for the particular semantic classes of verbs (by keeping a verifier/controller constant for example), and to control for many external factors (distractors) that could potentially have an influence on the speakers' judgements. In addition, a corpus does not provide negative evidence; the lack of data in a corpus does not mean that the phenomenon in question does not exist.

In the following, I will discuss four different acceptability judgement tasks and make a decision as to which task should be used in my own experiment.

8.2 Four types of acceptability judgement tasks

8.2.1 Forced-Choice task

There are four main types of design one could use to conduct an acceptability judgement experiment (Sprouse & Almeida 2017, Marty et al. 2018 among others). The first possibility is the Forced-Choice task. Here, participants analyze pairs of test sentences and choose the more acceptable / better alternative. Test sentences tend to appear as vertically arranged pairs. Each variant is followed by a single radio button. For every pair, participants select the radio button next to the sentence they consider more acceptable. The crucial point is that each pair of a particular sentence type / with a specific semantic feature is meant to be as similar as possible (both structurally and lexically) in order to constitute a syntactic / semantic minimal pair differing only in the phenomenon of interest. In a given scenario (for instance where the proposition *Marek is in England* holds), the following test sentences could be used in order to determine the aspect-related differences in factivity (adapted from Marty et al. 2018):

(362)   Forced-Choice, test item:

> *Ania zgadła, że Marek jest w Anglii.*   ○
> 'Ania guessed.PFV that Marek is in England.'[41]
>
> *Ania zgadywała, że Marek jest w Anglii.*   ○
> 'Ania guessed.IPFV that Marek is in England.'

Since I was interested in both qualitative and quantitative differences in the acceptance of (im)perfective forms across (non)factive scenarios, and in consideration of their

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[41] English translations of test items are more literal than translations of examples in the theoretical part, which is due to staying as close to the original as possible.

belonging to different semantic classes, I did not employ the Forced-Choice task in my experiment. It would report on the presence or absence of the effect, but not on distinctions in effect sizes. Furthermore, the Forced-Choice task does not tell us how good the better alternative, and how bad the worse one actually are (is the better variant just a little better or is the worse one completely unacceptable?).

8.2.2 Magnitude Estimation task

The second possibility is the magnitude estimation task, which aims at presenting a single test sentence to the participants. A test sentence is accompanied by a reference sentence, the so-called standard, with a pre-assigned acceptability rating – the modulus. The reference sentence should be in the middle range of acceptability and unrelated to the test sentence. Participants are told to estimate the acceptability of the test sentence as a numerical score being a multiple of the modulus. For example, if the participant considers the test sentence third as acceptable as the given standard (set up as 50 in (363)), the test sentence will be rated as 150 (based on Marty et al. 2018, see also Stevens 1957, Bard et al. 1996):

(363) Magnitude Estimation, item:

> *Ania nie udowadniała, od kiedy Marek jest w Anglii.*   **50**
> 'Ania did not prove.IPFV since when Marek is in England.'

(test item:)   *Ania zgadywała, że Marek jest w Anglii.*   □
> 'Ania guessed.IPFV that Marek is in England.'

Magnitude estimation tasks seem to be most suitable for syntactic or lexical contrasts. Since I am investigating context-bound differences in interpretation, I did not apply this method either.

8.2.3 Yes-No task

The Yes-No task provides the third option for collecting data via an acceptability judgement experiment. Here, each experimental item consists of a single test sentence accompanied by a pair of response options ('yes' and 'no'). Participants choose one of these options to estimate whether the test sentence is acceptable / good or not. Consider example (364):

(364) Yes-No task, test item:

> *Ania zgadywała, że Marek jest w Anglii.*   Yes○   No○
> 'Ania guessed.IPFV that Marek is in England.'

Both the Forced-choice and the Yes-No task could have been used in order to capture qualitative differences in the acceptance of (im)perfective forms across (non)factive scenarios; in (364), a specific context would be needed to make a judgement (for instance a proposition stating that it is a fact that Marek is in Italy). One of the aspectual

alternatives (one member of a respective pair, cf. (364) for an illustration) would be shown in a factive and / or a non-factive environment. In this case, because participants can in principle accept or reject both aspectual variants of a particular verb lexeme, a quantitative comparison of the effect across different verb groups is possible. In this kind of design, filler items complete experimental material, resulting in the creation of lists for many groups of participants in order to reduce processing efforts (a questionnaire would become very long if it contained all items). Due to the fact that the Yes-No task is primarily meant to detect qualitative differences between experimental conditions, I did not implement it in my experiment.

Luckily, there is another option left that makes it possible to conduct a direct quantitative analysis of the results. A modified version of its standard implementation was used in my experiment.

8.2.4   Likert Scale task

In the standard version of the Likert scale task, an experimental item consists of a single test sentence, which occurs together with a series of usually 5 or 7 response possibilities. As a result, a graded response scale arises. Participants are asked to estimate the acceptability of each test sentence (and usually also of the filler items) by marking a particular number on a scale. See example (365), which, presented in a specified context, could build a test item in my experiment.

(365)   Likert Scale, test item:
  Ania zgadywała, że Marek jest w Anglii.
  'Ania guessed.IPFV that Marek is in England.'

  1 2 3 4 5 6 7
  very good ○ ○ ○ ○ ○ ○ ○ very bad

As mentioned above, the Likert scale task served as a basis for the design of my experiment. I will go into the details of the procedure in the next section.

8.3   Motivation for the choice of the design

The choice of the design plays a fundamental role in detecting contrasts between (syntactic or semantic) minimal pairs. It has been observed that acceptability judgement experiments differ with respect to how sensitive they are at detecting such contrasts (cf. Sprouse & Almeida 2017, 2011, Marty et al. 2018 among others).

Sprouse & Almeida (2017) investigated which of the above-mentioned methods could be applied to the widest range of experimental scenarios in theoretical syntax. It was shown that the Forced-Choice task is the most sensitive one when it comes to reporting differences between two experimental conditions. However, it needs to be pointed out that it is also the only task which explicitly aims at contrasting two conditions. Likert

Scale and Magnitude Estimation reached almost the same sensitivity across effect and sample sizes, which suggests that participants treated Magnitude Estimation as a kind of a Likert Scale. The Yes-No task appeared to be the least sensitive method.

If the research question aims at detecting the better / more preferred variant of a particular linguistic phenomenon (sentence type, word order, semantic or pragmatic alternative, etc.), the Forced-Choice task seems to be the most suitable method; it will report on **qualitative differences** between experimental conditions. It will not provide any information on effect sizes though, which is why other tasks should be taken into consideration when planning quantitative research.

Marty et al. (2018) investigated the influence of both the mode of presentation of contrasting conditions (individual vs. joint presentation) and the features of the response scale (binary scales vs. Likert scales vs. continuous sliders) on the accuracy of speakers' judgements. Ten experiments differing with respect to one or two of the above-mentioned criteria have shown that, independently of the response scale used, there is always an advantage in presenting contrastive conditions jointly. Additionally, it is more beneficial to use graded than binary response scales or more precisely graded scales with no predefined labels.

According to Marty et al. (2018), if our research aims at finding quantitative differences between experimental conditions while testing minimal pairs, Likert Scale combined with joint presentation is one of the most promising types of design. Based on Marty et al.'s (2018) and Sprouse & Almeida's (2017) findings, I decided to integrate joint presentation into the Likert Scale in my own experiment.

As already mentioned, there are two crucial factors which need to be taken into consideration before deciding on which kind of acceptability judgement study should be conducted in order to give the most precise evidence for/against the initial hypothesis (cf. Marty et al. 2018).

First, one has to consider whether contrasting conditions (in the case of my investigation the (im)perfective verb forms) should be presented individually (Figure 1) or jointly (Figure 2). The advantage of choosing pairwise presentation lies in making participants aware of what matters for judging sentences as more or less acceptable. In my experiment, where pairwise presentation was used, the participants got an indirect hint that they should pay attention to the verb form. I decided to present contrasting conditions jointly in order to avoid the problem of what the acceptance of (one of) the aspectual variants is to be traced to. There may be many aspect-independent reasons for considering a sentence suitable in a given scenario; for instance, the choice of a lexeme in a matrix verb position, the speakers' attitudes towards the described state of affairs, etc. Furthermore, since the factivity-based contrast between perfective and imperfective verbs of communication seems to be at least an implicature, the presence of another

aspectual form for priming is the only way to identify potential differences in interpretation.

To sum up, in the case of presenting only one aspectual alternative of a given pair, it might not be clear if its acceptance in a particular context is due to aspect; there may be multiple reasons for judging a sentence as more or less acceptable.

<u>Individual presentation</u>	
(Non)factive scenario:	
Sentence to be judged:	
{Marek udowodnił, że Basia kłamie.	**very good ------- very bad}**
'Marek proved.PFV that Basia is lying.'	

Figure 1: Presenting contrasting conditions individually (based on Marty et al. 2018).

<u>Joint presentation</u>	
(Non)factive scenario:	
Sentences to be judged:	
{Marek udowodnił, że Basia kłamie.	**very good ------- very bad}**
'Marek proved.PFV that Basia is lying.'	
{Marek udowadniał, że Basia kłamie.	**very good ------- very bad}**
'Marek proved.IPFV that Basia is lying.'	

Figure 2: Presenting contrasting conditions jointly (based on Marty et al. 2018).

Second, one needs to decide on features of the response scale. There is a choice between binary scales (2 options), discrete 5-/7-point scales (many options) and continuous scales (infinite scales). For the reasons sketched above, a non-binary scale is the most suitable solution for detecting the pairwise contrast I am interested in. Since I cannot see any concrete advantage of using an infinite scale, I decided to employ a standard 7-point scale.[42]

In the next chapter, I will present the acceptability judgement study on the relationship between perfectivity and truthfulness in Polish.

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[42] There have also been problems reported for this response option. For instance, in spite of the possibility of using a non-limited scale, it has been observed that participants use a small set of numbers again and again, cf. Featherston (2008), Weskott & Fanselow (2011), Marty et al. (2018) among others. Furthermore, it even happens that participants do not manage to make a ratio comparison of the acceptability of two sequences at all, cf. Sprouse (2011), Marty et al. (2018).

9 Acceptability judgement study on the relationship between perfectivity and truthfulness in Polish[43]

9.1 Tool: Lime survey

Both constructing the items and conducting the experiment were carried out using LimeSurvey – the online open source survey tool (cf. LimeSurvey Project Team & Schmitz 2012). Every speaker received a unique access key, which enabled her to participate in the experiment. The keys were distributed among family, friends, and friends of friends (they were printed out and given directly to the contributors). The survey could be completed from any place. The only requirements were computer and internet access.

9.2 Participants

55 Polish native speakers participated in the survey. Four participants had to be excluded because they submitted incomplete results. In the end, I analyzed judgements made by 31 female and 20 male speakers between 19 and 60 years old. The participants' educational background is illustrated in Figure 3.

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[43] Ethical approval was not needed for the research conducted in this dissertation. The study was an online-survey that could be carried out anywhere, so no physical contact with participants was required. The whole procedure was anonymized, so it was not possible to assign results to physical persons. Participants were not asked for any personal data at any stage of the experiment (IP addresses were not stored either). No vulnerable groups were investigated; legal age was the participation requirement. The content of the questionnaire involved only neutral language judgements, so the participation did not involve any risk or physical / emotional discomfort. Naturally, every subject who explicitly agreed to participate was informed about the possibility of interrupting her participation at anytime and without any consequences, and explicitly agreed to the results being used for scientific purposes. See again below.
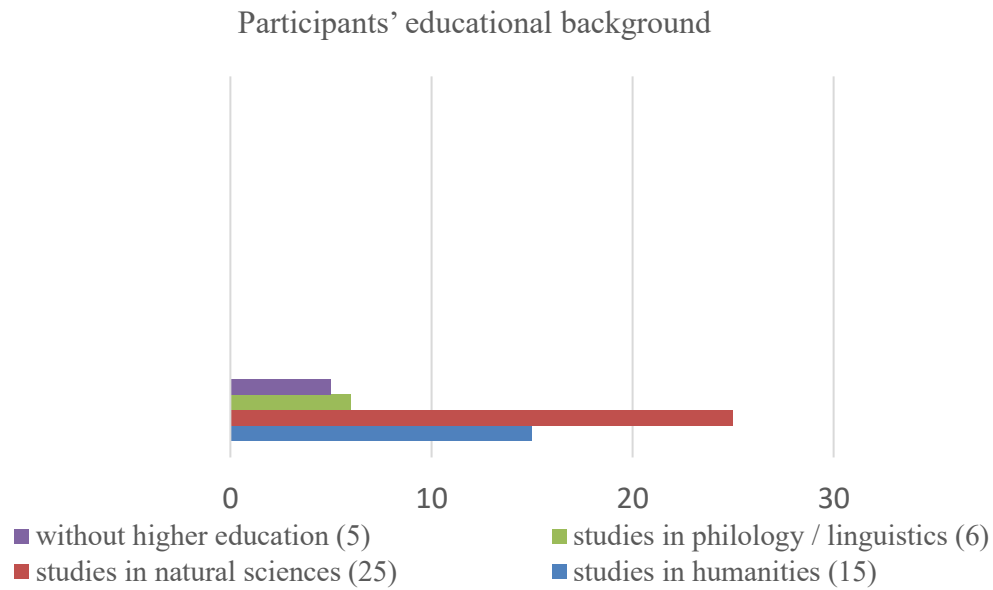
Figure 3: Participants' educational background.

9.3 Investigated verb lexemes

I investigated 15 (im)perfective verb pairs that were assigned to three different semantic groups (30 verbs altogether), see Figure 4. None of them allows for a neutral interpretation regarding aspect, i.e. every twin has either perfective or imperfective meaning. The assignment to a particular group took place on the basis of the expected type of truth-inference triggered by the matrix verb. The first group is the **presupposition group**. Here, the truth-inference survives in question constructions, under negation, and after the insertion of a modal adverbial. The second group is the **entailment group**, with a truth-inference occurring in a positive sentence, but without there being any projection pattern. The third group is the **implicature group**. In this case, the truth-inference was expected to be at least a weak implicature. All lexemes that belong to this group are verbs of communication.

presupposition group	entailment group	implicature group
zgadnąć.PFV – zgadywać.IPFV 'guess'	udowodnić.PFV – udowadniać.IPFV 'prove'	obwieścić.PFV – obwieszczać.IPFV 'announce'
przeczuć.PFV – przeczuwać.IPFV 'sense'	dowieść.PFV – dowodzić.IPFV 'prove'	poinformować.PFV – informować.IPFV 'inform'
wyczuć.PFV – wyczuwać.IPFV 'sense'	wykazać.PFV – wykazywać.IPFV 'reveal'	powiedzieć.PFV – mówić.IPFV 'say'
rozgryźć.PFV – rozgryzać.IPFV 'work out'	pokazać.PFV – pokazywać.IPFV 'show'	zakomunikować.PFV – komunikować.IPFV 'announce'
przewidzieć.PFV – przewidywać.IPFV 'predict'	potwierdzić.PFV – potwierdzać.IPFV 'confirm'	zawiadomić.PFV – zawiadamiać.IPFV 'notify'

Figure 4: List of (im)perfective verb pairs investigated in my experiment.

The choice of verb lexemes was motivated by three factors. First, I aimed at analyzing verbs that fulfilled the requirements of belonging to one of the above-mentioned groups. In the case of presupposition verbs, there is only a small number of possible candidates in general, which is why considering frequency, for instance, as a factor was not a reasonable solution. Second, both the perfective and the imperfective variants of a particular verb lexeme were expected to form a syntactically well-formed unit after being combined with a that-clause, which also limited the number of suitable candidates. Third, the three inference-based groups were meant to constitute more or less semantic-lexically unique classes, which worked perfectly for the entailment group (incremental theme verbs; reveal-type-verbs) and for the implicature group (verbs of communication). The final choice of the experimental material was made on the basis of the Polish dictionary of synonyms "Gdy Ci słowa zabraknie", Broniarek (2005).

In order to improve the accuracy of the analysis, I also investigated the frequency of occurrence of the (im)perfective verb pairs in NKJP. The results are summarized in Figure 5.

	verb pair	number of examples in NKJP
guess	**zgadnąć.PFV**	**1439**
	zgadywać.IPFV	586
sense	przeczuć.PFV	180
	przeczuwać.IPFV	**1320**
sense	wyczuć.PFV	2208
	wyczuwać.IPFV	2308
work out	**rozgryźć.PFV**	**275**
	rozgryzać.IPFV	81
predict	przewidzieć.PFV	10285
	przewidywać.IPFV	**21423**
prove	**udowodnić.PFV**	**9284**
	udowadniać.IPFV	1858
prove	dowieść.PFV	2459
	dowodzić.IPFV	**8059**
reveal	**wykazać.PFV**	**16609**
	wykazywać.IPFV	7912
show	**pokazać.PFV**	**36529**
	pokazywać.IPFV	24824
confirm	**potwierdzić.PFV**	**16485**
	potwierdzać.IPFV	14245
announce	**obwieścić.PFV**	**690**
	obwieszczać.IPFV	393
inform	poinformować.PFV	24513
	informować.IPFV	**28593**
say	powiedzieć.PFV	282514
	mówić.IPFV	**436927**
announce	**zakomunikować.PFV**	**36529**
	komunikować.IPFV	24824
notify	**zawiadomić.PFV**	**4393**
	zawiadamiać.IPFV	1696

Figure 5: Frequency of occurrence of the (im)perfective verb pairs in NKJP (26.04.2019).

The following query was used to identify the lexemes in question:

[base=*verb* & !pos=pcon & !pos=pant & !pos=ger & !pos=pact & !pos=ppas]. **Base** was parametrized by the particular aspectual form in infinitive (for example *zgadnąć*, *zgadywać*, etc.). The function of **base** is to find all forms of a certain lexeme. The value of **base** is a basic form (verbs in infinitive, nouns in first person singular nominative). However, for instance the base *zgadywać* would also return gerunds like *zgadywanie* or participles (imiesłowy) like *zgadujący*, which is why I restricted the query by commands excluding such non-verbal derivates from the analysis; negation is marked by an exclamation mark. As a result, the following constructions were omitted: imiesłów przysłówkowy współczesny (PCON), e.g. *zgadywając*, imiesłów przysłówkowy uprzedni (PANT), e.g. *zgadnąwszy*, odsłownik: gerund (GER), e.g. *zgadywanie*, imiesłów przymiotnikowy czynny (PACT), e.g. *zgadujący*, and imiesłów przymiotnikowy bierny (PPAS), e.g. *zgadywany*. For the corpus description and especially for the IPI PAN search tool that was used in the above study see Przepiórkowski (2004). The aim of analyzing the frequency of the aspectual pairs was to find out which of the two competitors of a respective verbal concept is 'more stable' in the mental lexicon of Polish native speakers. Frequency may have an aspect-independent influence on the acceptance, so its consideration may be useful in explaining experimental results.
I used the balanced NKJP subcorpus with three hundred million segments.

It should be pointed out that there is a slight difference in meaning between *przeczuć* and *wyczuć* 'sense', *udowodnić* and *dowieść* 'prove' and *obwieścić* and *zakomunikować* 'announce'. In the former case, *przeczuć* seems to be more specified, since it requires an intuition-based source of evidence. *Wyczuć*, on the other hand, refers to objective hints that made it possible to sense something (right). This explains why *przeczuć* is less frequent than *wyczuć*, and why one can say: *Moje przeczucie się nie sprawdziło* 'My hunch was not right', but not: *Moje #wyczucie się nie sprawdziło*. In the case of the second-mentioned verb pair, *dowieść* is more archaic than *udowodnić* (and preferred in the literary language), which is why it is less frequent. *Udowodnić* seems to stress incrementality of the underlying process of proving more strongly. It is further the standard form used in legal contexts. In the case of the last-mentioned verb pair, *obwieścić* is more archaic – it occurs for instance in Biblical contexts – hence it is less frequent in the corpus. It also has a negative component of meaning (*Dzisiaj obwieściła, że nie przyjdzie* 'Today she announced that she is not going to come' → The speaker does not like the decision of the sentence subject).

In the following, I will move on to the structure of the survey.

9.4   The structure of the survey

The survey consisted of four parts. First, participants were asked some general questions. They had to agree that they have been sufficiently informed about the experiment in order to proceed (cf. Figure 6 and Figure 7).

Oświadczam, iż została/-em wystarczająco poinformowana/-y o badaniu oraz jego przebiegu. Zapoznała/-em się z treścią informacji na temat badania i nie zgłaszam w tej sprawie żadnych obiekcji. Dobrowolnie wyrażam zgodę na udział w badaniu oraz na wykorzystywanie zanonimizowanych wyników w celach naukowych, jak i na ich dalsze przetwarzanie w formie elektronicznej.

I declare that I have been sufficiently informed about the experiment and its procedure. I am familiar with the information about the experiment, and I do not raise any objections to it. I voluntarily agree to participate, and I am giving my permission to use my anonymized responses for research purposes, and for them to be electronically processed.

Jestem świadoma/-y, iż w każdej chwili mogę przerwać mój udział w badaniu.
I am aware of the fact that I can stop anytime before completing.

Jestem osobą pełnoletnią.
I am of legal age.

○ Potwierdzam.
  I confirm.

Figure 6: Agree-item 1.

Zgadzam się na prezentowanie wyników w formie anonimowej na konferencjach/workshopach naukowych oraz podczas seminariów i wykładów.
I am giving my permission to present the anonymous results during conferences/scientific workshops and during seminars and talks.

○ Zgadzam się.
  I agree.

Figure 7: Agree-item 2.

Afterwards, the participants were asked about their mother tongue (Polish was a requirement). No bilingual speakers participated. Further questions concerned foreign languages spoken, age, gender, and educational background (the options were: studies in philology/linguistics, studies in humanities, studies in natural sciences, no higher education).

Second, the warm-up items appeared (see the next subsection).

Afterwards, participants were presented with two groups of test items (constant randomization groups called **random2** and **random3**). Dividing test items into two groups was aimed at preventing the same verb pair from being presented in a factive and a non-factive scenario one after the other. For instance, if *guess* belongs to the random2 group in a factive context, it is placed in the random3 group in a non-factive context. Some verbs were assigned to the random2 group when presented in a factive scenario, and others when presented in a non-factive scenario (there was no 1:1 relationship between randomization group and the type of the scenario, but the ordering itself was determined by the (non)factivity of the scenarios in relation to the particular

verb). Furthermore, the order of presenting items within the two randomization groups was individually randomized for every participant.

9.5 Two types of items

9.5.1 Warm-up items

Before starting with the actual test items, the participants were presented with two warm-up questions. The warm-up questions were introduced in order to make respondents familiar with the task itself, consider Figure 8 and Figure 9. Figure 8 was also intended to indicate that it is fine to consider both variants equally fine.

W tej części ankiety znajdują się dwa przykłady, które nie należą do eksperymentu głównego. Celem ich wprowadzenia jest zapoznanie Państwa z zadaniem stosowanym w eksperymencie głównym.
In this part of the questionnaire, you will find two item examples, which do not belong to the main experiment. They aim at making you familiar with the task used in the main experiment.

Proszę zaznaczyć w skali między *idealnie* a *bardzo źle*, jak dobrze wyrażenia (a) i (b) odpowiadają treści kontekstu, w jakim są prezentowane. Proszę kierować się jedynie zgodnością w treści. Nie ma limitu czasowego.
Mark on a scale between **ideal** *and* **very bad***, how well the expressions (a) and (b) correspond to the context. Consider compatibility in content only. There is no time limit.*

Dwóch chłopców zjadło w sumie pięć batonów, a dwie dziewczynki zjadły ich w sumie cztery.
Two boys ate five bars of chocolate altogether, and two girls ate four bars of chocolate altogether.

(a) *Chłopcy zjedli w sumie więcej batonów niż dziewczynki.* The boys ate more bars of chocolate altogether than the girls did.

　　idealnie ideal ○ ○ ○ ○ ○ ○ ○ **bardzo źle** very bad

(b) *Dziewczynki zjadły w sumie mniej batonów niż chłopcy.* The girls ate less bars of chocolate altogether than the boys did.

　　idealnie ideal ○ ○ ○ ○ ○ ○ ○ **bardzo źle** very bad

Figure 8: Warm-up item 1.

W tej części ankiety znajdują się dwa przykłady, które nie należą do eksperymentu głównego. Celem ich wprowadzenia jest zapoznanie Państwa z zadaniem stosowanym w eksperymencie głównym.

In this part of a questionnaire, you will find two item examples, which do not belong to the main experiment. They aim at making you familiar with the task used in the main experiment.

Proszę zaznaczyć w skali między *idealnie* a *bardzo źle*, jak dobrze wyrażenia (a) i (b) odpowiadają treści kontekstu, w jakim są prezentowane. Proszę kierować się jedynie zgodnością w treści. Nie ma limitu czasowego.

*Mark on a scale between **ideal** and **very bad**, how well do the expressions (a) and (b) correspond to the context. Consider compatibility in content only. There is no time limit.*

Ania zauważyła, że z kuchni zniknęły wszystkie pączki. Wkrótce stało się jasne, kto za tym stoi. Marek przyznał, że to on je

Ania realized that all donuts disappeared from the kitchen. Soon it became clear who was responsible for that. Marek confessed that it was him who

(a) *jadł*. ate.IPFV *(them)*.

    idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(b) *zjadł*. ate.PFV *(them)*.

    idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 9: Warm-up item 2.

9.5.2 Test items

Regarding the test items, every proper name and every surname (the name of every character) was used only once in the survey. Furthermore, the order of displaying the (im)perfective minimal pairs was pseudo-randomized. The reason for this was to exclude (or at least to minimize) possible habituation effects.

9.6 Two types of scenarios

As mentioned above, every (im)perfective verb pair was presented in a factive and a non-factive scenario. However, the same pair never appeared in the two scenarios one after the other.

The description of the context always started with introducing a proposition that was to be considered a fact (participants were given direct instructions to take its truth for granted). Afterwards, a short story was told. The structure of the story was kept as simple as possible, mostly on the following style: *X did something, and Y did something*. In a factive scenario, the character that did the right thing – something which was in line with the proposition introduced in the beginning – was picked out. In contrast, the character that did the wrong thing – something that did not correspond to the fact described at the top of the page – was selected in the non-factive scenario.

In a nutshell, the perfective was expected to score higher in the factive scenario, while the imperfective was expected to score higher in the non-factive scenario.

9.7 Item examples[44]

9.7.1 *guess* from the presupposition group

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Marek ukradł nasz służbowy komputer.

Consider what follows a fact: Today it became clear that Marek stole our company computer.

Księgowa Majewska i programista Adamczyk niezależnie od siebie wytypowali sprawców.

Tylko programista Adamczyk wskazał właściwą osobę –

Accountant Majewska and programmer Adamczyk independently of each other bet on who the thief was. Only programmer Adamczyk picked out the right person –

(a) *zgadł, że Marek jest winny*. *He guessed.*PFV *that Marek was guilty.*

    idealnie ideal ○ ○ ○ ○ ○ ○ ○ **bardzo źle** very bad

(b) *zgadywał, że Marek jest winny*. *He guessed.*IPFV *that Marek was guilty.*

    idealnie ideal ○ ○ ○ ○ ○ ○ ○ **bardzo źle** very bad

Figure 10: Experimental item for 'guess' in a factive scenario.

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Krzysztof ukradł nasz służbowy komputer.

Consider what follows a fact: Today it became clear that Krzysztof stole our company computer.

W czasie trwania śledztwa programista Król wytypował Izę, a księgowa Zabłocka wytypowała Krzysztofa.

Programista Król był wyraźnie rozczarowany –

During the investigation programmer Król picked out Iza, and accountant Zabłocka Krzysztof. Programmer Król was clearly disappointed –

(a) *zgadł, że Iza jest winna*. *He guessed.*PFV *that Iza was guilty.*

    idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(b) *zgadywał, że Iza jest winna*. *He guessed.*IPFV *that Iza was guilty.*

    idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 11: Experimental item for 'guess' in a non-factive scenario.

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[44] See appendix for the full list.

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9.7.2 *prove* from the entailment group

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Alicja ukradła nasz służbowy komputer.

Consider what follows a fact: Today it became clear that Alicja stole our company computer.

Komisarz Jankowski oraz komisarz Nowak niezależnie od siebie prowadzili śledztwo w tej sprawie.

Komisarz Nowak jako jedyny w sposób niepodważalny udokumentował winę Alicji –

Commissioner Jankowski and commissioner Nowak independently of each other investigated the case. Only commissioner Nowak irrefutably documented that Alicja was to blame –

(c) *udowodnił, że to jej sprawka*. *(He) proved.*PFV *that she was guilty.*

   idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(d) *udowadniał, że to jej sprawka*. *(He) proved.*IPFV *that she was guilty.*

   idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 12: Experimental item for 'prove' in a factive scenario.

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Fryderyk ukradł nasz służbowy komputer.

Consider what follows a fact: Today it became clear that Fryderyk stole our company computer.

W czasie dochodzenia komisarz Malinowski wskazywał na Józefa, a komisarz Stępień na Fryderyka.

Komisarz Malinowski z trudem przyjął swoją porażkę –

During the investigation commissioner Malinowski picked out Józef, and commissioner Stępień Fryderyk. Commissioner Malinowski could hardly accept that he was wrong –

(a) *udowodnił, że Józef jest winny*. *(He) proved.*PFV *that Józef was guilty.*

   idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(b) *udowadniał, że Józef jest winny*. *(He) proved.*IPFV *that Józef was guilty.*

   idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 13: Experimental item for 'prove' in a non-factive scenario.

9.7.3 *say* from the implicature group

Factive scenario

Potraktuj co następuje jako fakt: To pewne, że to Teodor ukradł pieniądze z kasy.
Consider what follows a fact: It's a certainty that Teodor stole the money from the safe.

Dyrektor Karpiński i księgowa Gajda opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie dyrektor Karpiński przekazuje dalej dokładnie sprawdzone informacje.
Director Karpiński and accountant Gajda each said different things about who the potential culprit was, but only director Karpiński is passing on the exactly proved information.
To on
It was him who

(a) *powiedział nam, że Teodor jest winny*. *(He) told*.ᴘꜰᴠ *us that Teodor was guilty.*

 idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(b) *mówił nam, że Teodor jest winny*. *(He) told*.ɪᴘꜰᴠ *us that Teodor was guilty.*

 idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 14: Experimental item for 'say' in a factive scenario.

Non-factive scenario

Potraktuj co następuje jako fakt: To nie Brygida ukradła pieniądze z kasy.
Consider what follows a fact: It was not Brygida who stole the money from the safe.

(a) *Grafik Klimek niby powiedział nam, że Brygida jest winna, wszyscy jednak wiemy, że on ma tendencję do zmyślania*. *Graphic designer Klimek kind of told*.ᴘꜰᴠ *us that it was Brygida's fault, but we all know that he has a tendency to make things up.*

  idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

(b) *Grafik Klimek niby mówił nam, że Brygida jest winna, wszyscy jednak wiemy, że on ma tendencję do zmyślania*. *Graphic designer Klimek kind of told*.ɪᴘꜰᴠ *us that it was Brygida's fault, but we all know that he has a tendency to make things up.*

  idealnie ○ ○ ○ ○ ○ ○ ○ **bardzo źle**

Figure 15: Experimental item for 'say' in a non-factive scenario.

I would like to discuss one crucial point that concerns the way of formulating both the context sentences and the (im)perfective interpretation alternatives. As the above item examples illustrate, there are different types of scenarios for the presupposition and the entailment verbs on the one hand, and for the communication verbs on the other. In the case of verbs of communication, the inference is weak and pragmatic in nature, which means that there is no easy way to empirically test for its existence. Anyhow, the way of testing for it must differ from the way implemented for the two other aforementioned groups of verbs, where the inference is semantically definable. In this experiment, I aimed at detecting the (non)factive meanings of the (im)perfective verbs of

communication based on the reliability-condition. In order to achieve that, I had to modify the experimental material. In the case of perfective communication verbs, the proposition from the embedded clause is expected to be taken for granted due to the reliability of the sentence subject (expressed within the interpretation alternatives). More precisely, the participants should rank the perfective higher than the imperfective in the factive scenario, because the reporting subject is described as reliable (so that we can assume that p is true). In contrast, in the non-factive context, the perfective should be ranked lower than the imperfective, because the subject does not count as reliable, and as a result, she is not expected to tell the truth. Due to the deviation in the structure of the test material, the implicature-based part of the study can be treated as a separate (sub-)experiment.

9.8   Experimental hypotheses

In a factive scenario, the perfective should receive a higher acceptance than the imperfective. However, we do not expect the imperfective to be completely rejected there. The reason for ranking the imperfective lower results from the speaker following Grice's Maxim of Quantity. According to Grice (1975: 45), the category of Quantity relates to the quantity of information that is provided by an utterance, and it is specified by two submaxims. First, one should make one's contribution as informative as necessary for the purpose of the conversation, and second (or at the same time), one should not make her contribution more informative than is required. The imperfective appears less informative than the perfective in a factive scenario, because it does not say anything about the final result of the process described by the proposition from the embedded clause. In other words, it does not provide as much information as is necessary for the fulfillment of the current goal of communication.

In a non-factive scenario, the imperfective should score higher than the perfective. We expect the perfective to be clearly rejected within the presupposition and the entailment verb groups. The question remains as to whether there are any quantitative differences in acceptability between these groups. Furthermore, we do not expect the perfective to be completely ruled out in the case of verbs of communication, because the truth-inference they might trigger is at least a weak implicature.

10 Results

10.1 General findings

Figure 16 demonstrates general results for each verb group.
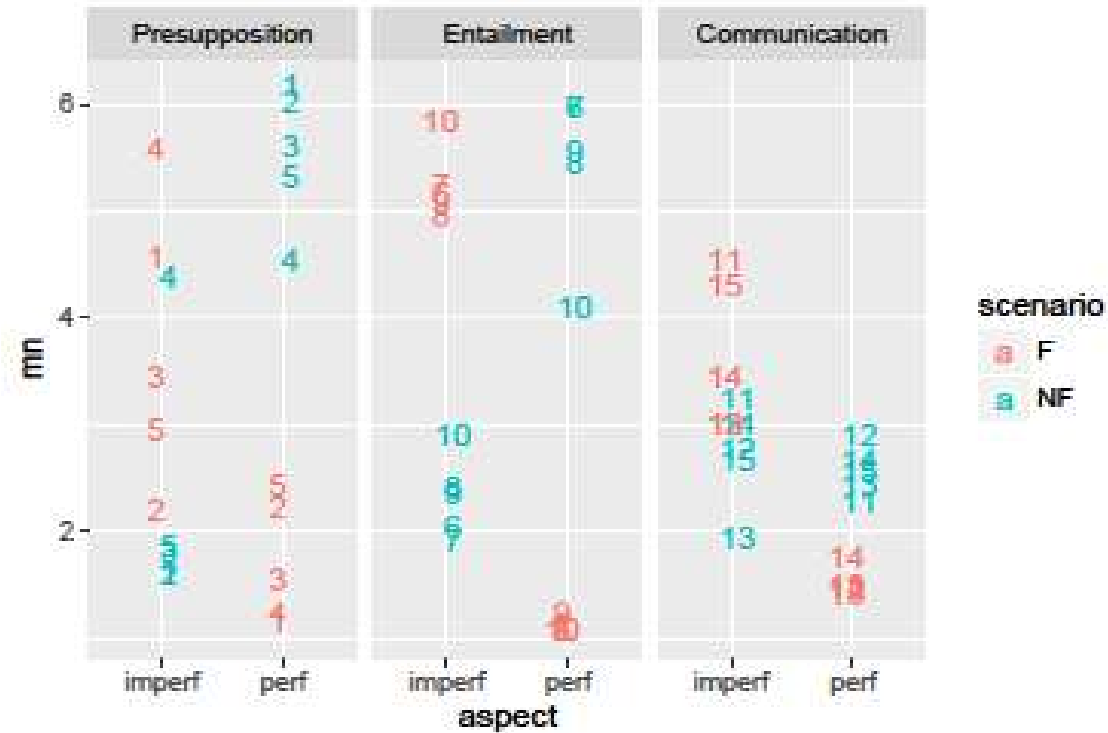

Figure 16: The mean acceptance range of the (im)perfective verb pairs in a factive and a non-factive scenario in the presupposition, entailment and communication group. The numbers represent two aspectual variants of the respective lexemes.

The following verb lexemes are encoded by the respective numbers:

presupposition group		entailment group		implicature group	
1	zgadnąć.PFV – zgadywać.IPFV 'guess'	6	udowodnić.PFV – udowadniać.IPFV 'prove'	11	obwieścić.PFV – obwieszczać.IPFV 'announce'
2	przeczuć.PFV – przeczuwać.IPFV 'sense'	7	dowieść.PFV – dowodzić.IPFV 'prove'	12	poinformować.PFV – informować.IPFV 'inform'
3	wyczuć.PFV – wyczuwać.IPFV 'sense'	8	wykazać.PFV – wykazywać.IPFV 'reveal'	13	powiedzieć.PFV – mówić.IPFV 'say'
4	rozgryźć.PFV – rozgryzać.IPFV 'work out'	9	pokazać.PFV – pokazywać.IPFV 'show'	14	zakomunikować.PFV – komunikować.IPFV 'announce'
5	przewidzieć.PFV – przewidywać.IPFV 'predict'	10	potwierdzić.PFV – potwierdzać.IPFV 'confirm'	15	zawiadomić.PFV – zawiadamiać.IPFV 'notify'

Figure 17: Verb lexemes that are encoded by the particular numbers.

Figure 16 reveals a clear correlation between perfectivity and factivity. The perfective scores higher in a factive than in a non-factive scenario within each verb group. Additionally, the strength of interaction between (im)perfectivity and (non)factivity varied across all groups.

The strongest effect can be observed within the entailment group. Here, the perfective forms of all lexemes received the highest acceptance rates in the factive, and the lowest acceptance rates in the non-factive scenarios. This confirms that perfectivity not only goes along with factivity but also (and even more importantly) it is incompatible with non-factivity. Furthermore, there is a clear interaction between perfective and imperfective aspect across the two scenarios. The imperfective is strongly accepted in a non-factive context, and it tends to be rejected in a factive one.

I would like to emphasize the deviant behavior of the verb pair encoded as 10: *potwierdzać*.IPFV – *potwierdzić*.PFV 'confirm'. There is only a minimal interaction between the two aspectual forms in a non-factive scenario. The expectations for *confirm* were of an explorative character; it seems that this verb belongs in the communication rather than in the entailment group. As will become clear later, it lacks incremental character, which seems to be the main factor responsible for triggering entailment.

Within the presupposition group, there is an interaction between perfectivity and (non)factivity as well (but it is more scattered compared to the entailment group). As expected, the perfective scores better in a factive environment, and it tends to be rejected in a non-factive one. There is also a cross-shaped interaction between the (im)perfective aspect and (non)factivity. The strongest differences in acceptability between the two aspectual forms were found in a non-factive context, where the imperfective was judged as close to ideal, and the perfective was mostly rejected.

Interestingly, the verb pair 4: *rozszyfrowywać*.IPFV – *rozszyfrować*.PFV 'work out' received a middle acceptance rate in a non-factive scenario independently of aspect. As will be discussed in a further part of this section, this might result from differences in accessibility to the metaphorical meaning of 'work out' (literal meaning is 'crack') among speakers. Crucially, the two aspectual forms are complementary distributed in a factive context (with the perfective scoring very high and the imperfective very low), which further confirms the perfectivity-factivity dependency.

As expected, the weakest effect was found within verbs of communication. Here, the perfective is slightly (but systematically) better in a factive than in a non-factive scenario. Furthermore, there is an interaction between (im)perfectivity and factivity, with the perfective scoring better than the imperfective in a factive scenario. In the case of communication verbs, the aspect seems to have a limited access to the content of an embedded proposition. It rather marks the (non-)realization of all parts of the speech act, i.e. whether the hearer received the information or not. This is why, within this verb group, the truthfulness-effect was weaker than for other groups.[45]

Figure 18 summarizes the interaction between (im)perfectivity and (non)factivity in each verb group at a cross-shaped vertex.[46]

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[45] I would like to thank Manfred Krifka for pointing this out.

[46] It can be seen that communication verbs were ranked lower with complement clauses than other verb groups. This might be due to their complex argument structural properties and possible preferences in particular syntactic environments.
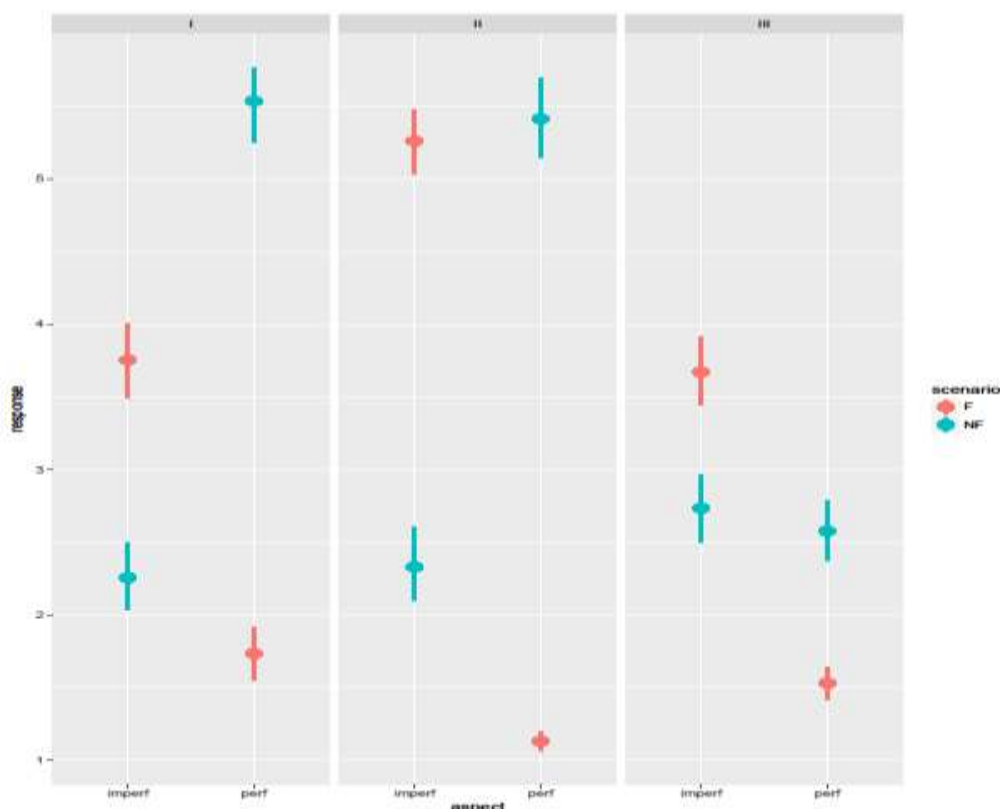
Figure 18: The interaction between (im)perfectivity and (non)factivity at a cross-shaped vertex in each verb group. I: presupposition verbs, II: entailment verbs, III: verbs of communication.

For a more detailed discussion, see section 10.3. In the following, I will present a statistical analysis for each verb group.

10.2 The paired-samples *t*-test

A *t*-test is a statistical hypothesis test that compares two means in order to identify whether there is a significant difference between them (cf. Gries 2009, Urdan 2010 amongst others). The two most commonly used *t*-tests are the independent-samples *t*-test and the paired-samples *t*-test.

The independent-samples *t*-test compares two independent samples on a given variable. For instance, if one wants to compare the average weight of a hundred randomly chosen boys to that of a hundred randomly chosen girls, the independent-samples *t*-test should be conducted. Because the two samples are unrelated and there is no intersection between them, we call the two groups independent. Boys and girls constitute an independent variable with two categories, and weight represents a dependent variable. An independent-samples *t*-test examines whether the average scores on the dependent variable (weight) differ depending on belonging to a particular group (boys vs. girls), cf. Urdan (2010: 93).

The paired-samples *t*-test also aims at comparing two means on a single dependent variable. In contrast to the independent-samples *t*-test, however, it compares the means of a single sample or of two paired / matched samples. For example, following Urdan (2010: 94), in order to compare a sample of boys' Scholastic Aptitude Test (SAT) scores with their fathers' SAT scores, each boy needs to be matched with his father. As a result, each score is matched / paired with a second one. Because of this pairing, the scores are dependent upon each other, and a dependent samples *t*-test needs to be applied. Similarly, in the study conducted in this dissertation, every perfective verb is matched with its imperfective twin. The goal is the detection of possible differences in interpretation between two aspectual forms of a given lexeme (and within certain groups of verbs) depending on the factivity of the scenarios. Crucially, due to the joint presentation procedure, the (im)perfective verb forms function as primers to each other.

More precisely, I compared the differences in acceptability between the (im)perfective aspect ratings within each verb group (two samples: the imperfective and the perfective members of the respective minimal pairs) once in a factive, and once in a non-factive scenario (i.e. the acceptability of the two aspectual forms depend on the factivity of the scenarios). The statistical analysis was calculated in RStudio (cf. RStudio Team 2016), by using the following formulas: > WITH(SUBSET(PRS, SCENARIO == "F"), + T.TEST(MN~ASPECT, PAIRED=T)) and > WITH(SUBSET(PRS, SCENARIO == "NF"), + T.TEST(MN~ASPECT, PAIRED=T)) for presupposition verbs, > WITH(SUBSET(NTL, SCENARIO == "F"), + T.TEST(MN~ASPECT, PAIRED=T)) and > WITH(SUBSET(NTL, SCENARIO == "NF"), + T.TEST(MN~ASPECT, PAIRED=T)) for entailment verbs, as well as > WITH(SUBSET(CMN, SCENARIO == "F"), + T.TEST(MN~ASPECT, PAIRED=T)) and > WITH(SUBSET(CMN, SCENARIO == "NF"), + T.TEST(MN~ASPECT, PAIRED=T)) for verbs of communication.[47]

In accordance with the standard assumptions, I consider the difference between two means significant if $p < 0.05$ (cf. Fisher 1925). If a result turns out to be significant, it provides strong evidence against the null hypothesis that assumes that there is no difference between the means or that any difference observed is due to chance.
The only problem with applying the *t*-test to my data lies in the fact that acceptability judgements are not 'dividable', which is why comparing means can seem questionable at first sight. However, since the *t*-test is a standard procedure for analyzing pairwise contrast, I decided to employ it for my analysis.

10.2.1 Presupposition group

I will begin with the presupposition group. A paired-samples *t*-test revealed, for the factive scenario, a non-significant difference between the perfective and the

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[47] PRS: presupposition group, NTL: entailment group, CMN: communication group.

imperfective aspect ratings ($t = 2.434$, $df = 4$, $p > 0{,}05$)[48]. In contrast, there is a significant difference between the two aspectual forms in the non-factive scenario, with the imperfective scoring higher than the perfective ($t = -4.0665$, $df = 4$, $p < 0{,}05$). These results provide evidence in favor of the initial hypothesis; there is a significant interaction between perfectivity and factivity in a non-factive context, and a clear tendency (even if not statistically significant) for such a correlation in a factive environment.

10.2.2 Entailment group

Within the entailment group, a highly significant difference between the perfective and the imperfective aspect ratings was detected in both scenarios. In a factive context, the imperfective scored lower than the perfective ($t = 24.983$, $df = 4$, $p < 0.001$). In the non-factive scenario, we observed the reverse significant difference ($t = -6.0464$, $df = 4$, $p < 0.01$), with the perfective scoring lower than the imperfective. These results strongly support the experimental hypothesis across all conditions.

10.2.3 Implicature group

For verbs of communication, a significant difference between the perfective and the imperfective aspect ratings was found in a factive scenario ($t = 6.2017$, $df = 4$, $p < 0{,}005$). The difference between the two aspectual forms in a non-factive context is non-significant ($t = 0.64953$, $df = 4$, $p > 0{,}5$). These findings also speak in favor of the perfectivity-factivity dependency.

10.3 Detailed investigations within each group

In this section, I will present a detailed analysis of the verb pairs within each group.

10.3.1 Presupposition group

10.3.1.1 The perfective in a factive scenario

The perfective clearly functions as a truthfulness trigger in the case of presupposition verbs. A general overview of its acceptance in a factive scenario is presented in Figure 19.

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[48] *T*: the actual *t*-value; it indicates the size of a difference relative to the variation in a particular data sample. If *t* is close to 0, it suggests the lack of a significant result. The greater the *t*-value, the greater the evidence in favor of the experimental hypothesis (and against the null hypothesis). The *p*-value establishes, on the basis of the *t*-value, the statistical significance of the effect.

Df: the degrees of freedom; the minimum amount of data needed to calculate a statistical analysis (numbers used to approximate the number of observations in the data set in order to determine a statistical significance), cf. Urdan (2010: 60).
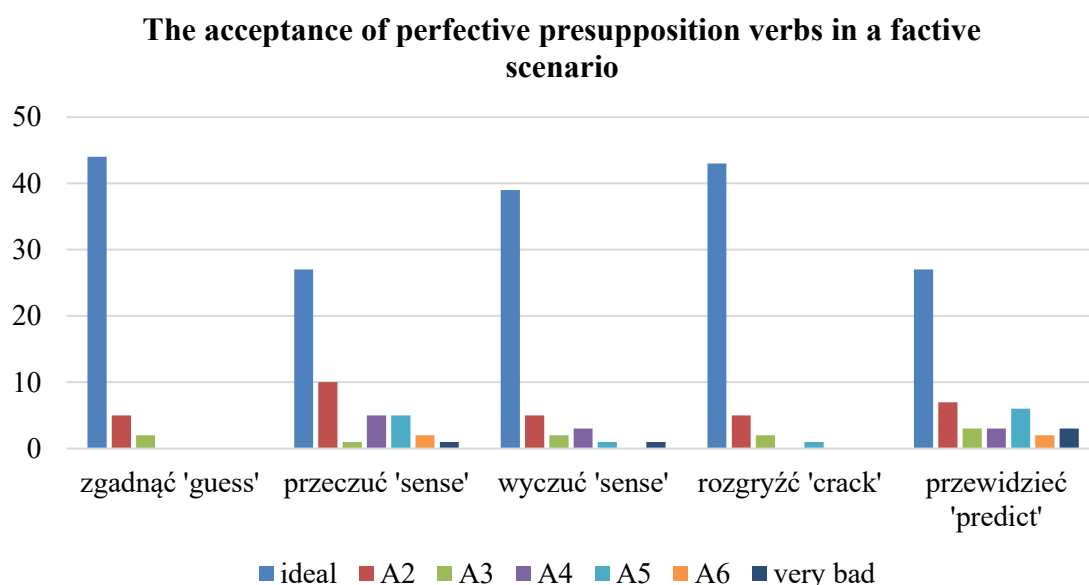
The acceptance of perfective presupposition verbs in a factive scenario

Figure 19: The acceptance of perfective presupposition verbs in a factive scenario.

Zgadnąć was perfectly accepted (by being judged as 'ideal' or A2) by 96% of the participants. The next highest scoring occurred with *rozgryźć*, with a 94% acceptance rate. *Wyczuć* was perfectly accepted by 86% of the participants, and *przeczuć* by 73%. *Przewidzieć* received a 67% acceptance rate.

Interestingly, some speakers did not accept *przeczuć* and *przewidzieć* in a factive scenario (6% judged *przeczuć* as 'very bad' or A6, and 10% clearly rejected *przewidzieć*). The reason for this might lie in a surprisingly high acceptance for the respective imperfective twins.

These observations correlate with the differences in frequency; both *przeczuć* and *przewidzieć* are clearly less frequent than their imperfective twins (*przeczuć*: 180 occurrences, *przeczuwać*: 1320 occurrences; *przewidzieć*: 10285 occurrences, *przewidywać*: 21423 occurrences). In the case of the three remaining verb pairs, either the perfective is more frequent than the imperfective (*zgadnąć* and *rozgryźć*) or there is only a slight difference between the two forms (*wyczuwać* is slightly more frequent than *wyczuć*), cf. Figure 5.

10.3.1.2 The imperfective in a factive scenario

Figure 20 presents a general overview of the results for the imperfective members of the analyzed aspectual pairs in a factive scenario.

The acceptance of imperfective presupposition verbs in a factive scenario
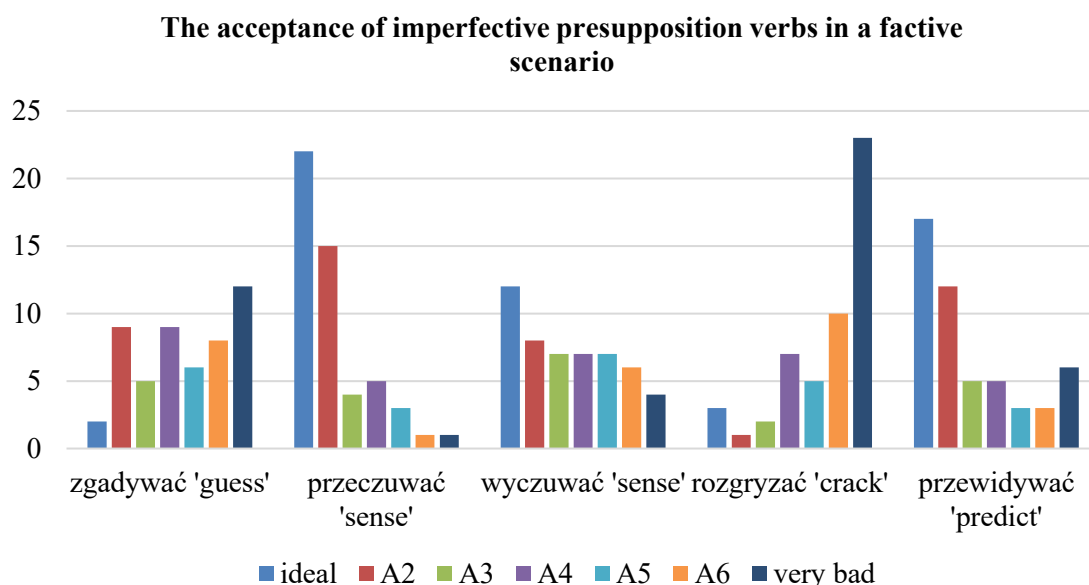
Figure 20: The acceptance of imperfective forms of presupposition verbs in a factive scenario.

As mentioned above, the imperfective *przeczuwać* and *przewidywać* both received a very high acceptance rate in a factive scenario – 72% and 57%, respectively (ratings 'ideal' or A2), which makes them serious competitors for their perfective partners in triggering factivity. Interestingly, these imperfective verbs are ambiguous between a factive and a non-factive interpretation, which, again, might be due to their high frequency (so that the imperfective takes over the function of the perfective). As will become clear later, *przeczuwać* and *przewidywać* are also perfectly acceptable in a non-factive context. It is worth mentioning that even the presence of the perfective primer did not prevent participants from judging the imperfective as (non-)factive (depending on the scenario).

In general and as expected, the imperfective forms received a middle acceptance rate in a factive scenario. Complete rejection rates (A6 or 'very bad') were as follows: 65% for *rozgryzać*, 40% for *zgadywać*, 20% for *wyczuwać*, 18% for *przewidywać*, and 4% for *przeczuwać*.

A relatively high rejection rate for *rozgryzać* (by a correspondingly high acceptance rate for its perfective twin *rozgryźć*) might be determined by three factors. First, *rozgryzać* has the lowest frequency of all investigated verbs, and it is more than three times rarer than its perfective twin *rozgryźć*. Second, *rozgryzać* combined with a *that*-clause produces a syntactically marked structure[49]. Third and lastly, the metaphorical

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[49] There is also an interesting tendency with respect to the occurrence of the imperfective *zgadywać* with a clausal complement. *Zgadywać, że* is rare (but still not really marked) in combination with a *that*-clause, but the construction seems to be especially productive when the matrix verb appears in the present tense. This confirms the neutrality of *zgadywać* in triggering factivity. We can find 49 instances of such usages in NKJP, cf. Pęzik (2012). The construction seems to be a spoken language phenomenon:

interpretation of *rozgryzać* (*be working out/'cracking' who solved the mystery* vs. *be cracking a nut*) is not accessible to every speaker. In contrast, *rozgryźć* seems to be lexicalized in its metaphorical meaning, and even if it also occurs rather with a nominal than with a propositional complement, its influence on the factive interpretation of the subordinate clause was clearly a basis for the speakers' judgements.

10.3.1.3 The perfective in a non-factive scenario

In the following, I will present experimental results for the acceptance of the (im)perfective presupposition verbs in a non-factive scenario. Just as a quick reminder, the perfective was expected to be completely rejected here, whereas the imperfective was supposed to be the default. Figure 21 illustrates the results for the perfective.

The acceptance of perfective presupposition verbs in a non-factive scenario
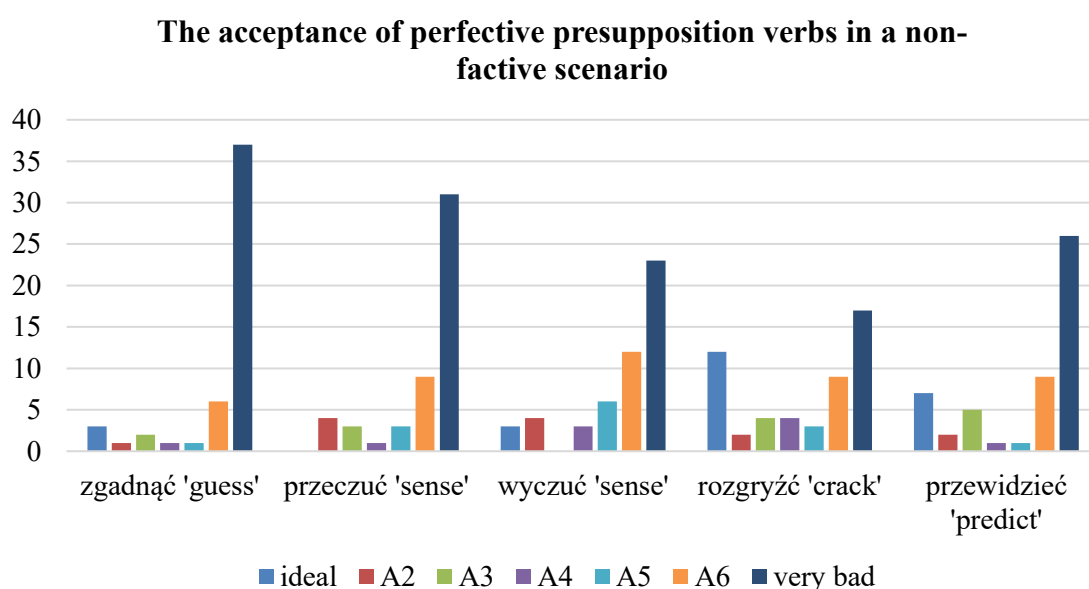
Figure 21: The acceptance of perfective forms of presupposition verbs in a non-factive scenario.

At first, I will concentrate on the results for *zgadnąć, przeczuć, wyczuć*, and *przewidzieć*. All these forms tend to be rejected in a non-factive scenario. *Zgadnąć* received an 85% rejection rate (ratings A6 or 'very bad'), and *przeczuć* 79%. *Wyczuć* and *przewidzieć* were clearly rejected by 69% of the participants, respectively. The results again reveal a special status of *zgadnąć*, which appears to be 'unquestionably' factive. We might consider treating the perfective and the imperfective realizations of 'guess' in Polish as semantically independent lexemes. The perfective *zgadnąć* would be assigned the meaning 'guess rightly', and the imperfective *zgadywać* 'take a guess'. Interestingly, the perfective and the imperfective forms are both achievements (Vendler 1957), which means that they do not stand in a typical **imperfective → activity, perfective → termination/accomplishment** relation; the only difference between

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PELCRA_6203010001731 (23.01.2019/11:21): *Ludzie gdzie żeście się wychowywali (zgaduje że w chlewie)?* 'People, where have you been brought up (I am guessing that in a pigsty?)

zgadywać and *zgadnąć* lies in (non)factivity. This shows that, in the case of the latter form, the meaning of perfectivity boils down to factivity (cf. Zuchewicz & Šimík 2018 for Polish and Czech).

Interesting results were found with the perfective *rozgryźć*. This verb appeared to be a strong factivity trigger in a factive scenario, but did not score unambiguously in a non-factive one. In a non-factive scenario, *rozgryźć* was completely rejected by 51% of the participants (ratings A6 and 'very bad'), but it was also perfectly accepted by 28% (ratings 'ideal' and A2). The reason for this might be that the metaphorical meaning of the perfective 'work out/crack' allows for a factive: 'crack something right/find a right answer', and a non-factive (subjective) interpretation: 'find an answer (for yourself)'. Depending on which meaning is accessible to the speaker, *rozgryźć* can be either factive or non-factive. This is why the judgments seem contradictory at first glance.

10.3.1.4 The imperfective in a non-factive scenario

Figure 22 demonstrates the acceptance of the imperfective counterparts of the analyzed presupposition verbs in a non-factive scenario.

The acceptance of imperfective presupposition verbs in a non-factive scenario
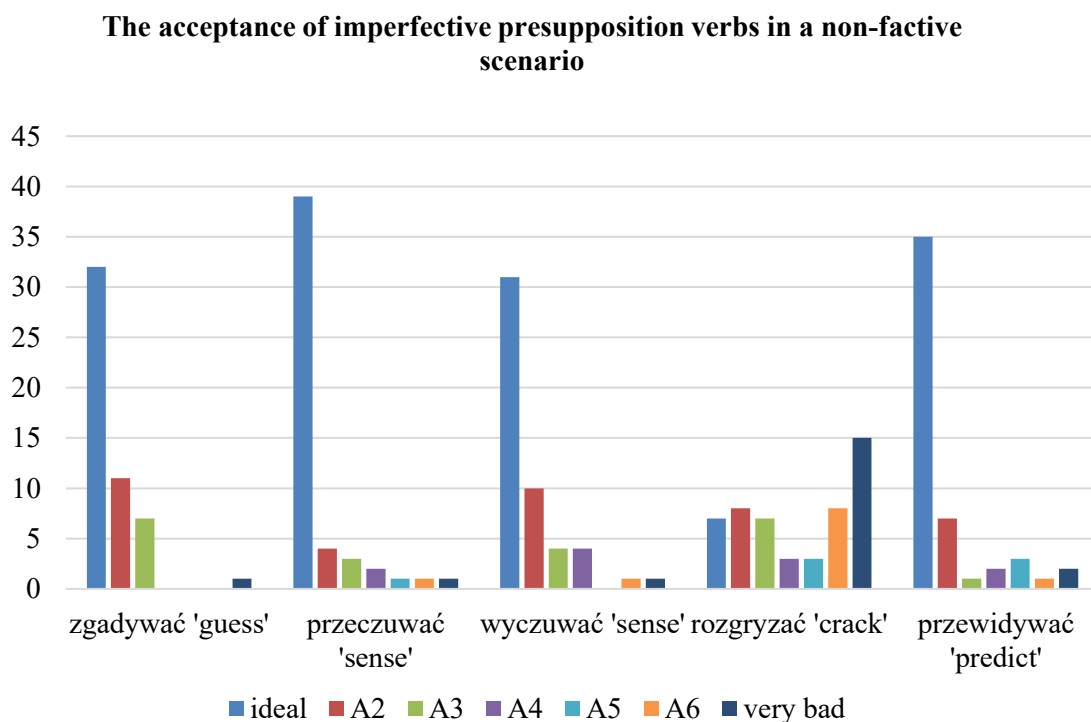
Figure 22: The acceptance of imperfective forms of presupposition verbs in a non-factive scenario.

Figure 22 clearly shows that the imperfective goes with a non-factive scenario (and that it is hardly ever rejected there). Because of anomalous results for *rozgryzać*, I will analyze this verb separately[50].

The highest acceptance rates (choosing 'ideal' or A2) are distributed as follows: 85% for *zgadywać* (compared to 2% for complete rejection by judging it as 'very bad' or A6), 84% for *przeczuwać* (4% for complete rejection), 83% for *przewidywać* (6% for complete rejection), and 81% for *wyczuwać* (4% for complete rejection).

The imperfective *rozgryzać* received inconsistent judgements. 30% of the participants gave it the highest acceptance, whereas 45% completely rejected it. The high rejection rate might result from the marked syntactic frame (again, for many participants the form itself seemed to be the basis for assessment). In contrast, participants who concentrated on the semantic contrast with a perfective primer did accept its imperfective twin. Furthermore, the fact that *rozgryzać* was completely rejected by 65% of the participants in the factive scenario proves that, despite its oddness in combination with a *that*-clause and a low frequency, it is still less marked when used non-factively.

To sum up, we saw that perfective presupposition verbs are indeed factive in that they received very high acceptance rates in a factive scenario. As expected, their imperfective counterparts received middle acceptance rates in a factive environment; however, *przeczuwać* 'to sense' and *przewidywać* 'to predict' turned out to be ambiguous between a factive and a non-factive interpretation. Furthermore, the perfective tended to be rejected in a non-factive context. Interestingly, although *rozgryźć* 'to work out/crack' turned out to be a strong factivity-trigger in a factive scenario, it was also compatible with a non-factive one. All imperfective variants of presupposition verbs except *rozgryzać* 'to work out/crack' clearly favor non-factive environments.

10.3.2 Entailment group

10.3.2.1 The perfective in a factive scenario

In this section I will present the experimental results for entailment verbs. As in the case of the presupposition group, I will start with the comparison between the perfective and the imperfective aspect in a factive scenario.

Figure 23 illustrates the results for the perfective.

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[50] I would like to briefly justify the fact that I did not remove the verb pair *rozgryzać – rozgryźć* 'work out/crack' from the main analysis. On the one hand, while planning my experiment, I still expected these lexemes to pattern with other presupposition verbs. On the other hand, I was aware of the syntactic oddness of *rozgryzać, że*, and of the non-systematic accessibility of the metaphorical interpretation of 'crack' in general. In the end, the results for this verb pair were intended to be explorative in character. A crucial observation concerns the fact that the perfective *rozgryźć* received a very high acceptance rate in a factive scenario, which confirms the correlation between perfectivity and factivity.

The acceptance of perfective entailment verbs in a factive scenario
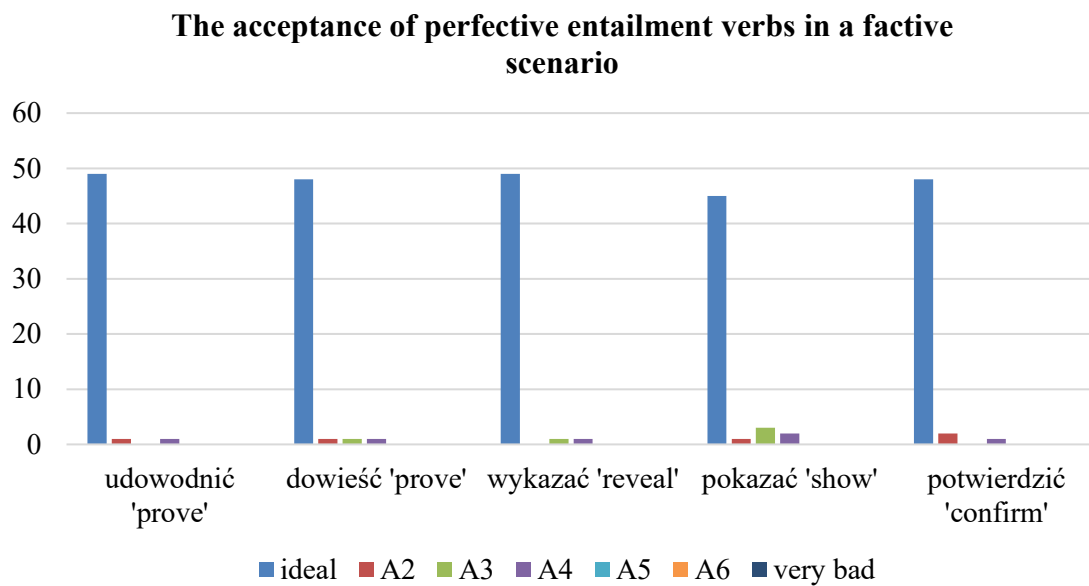
Figure 23: The acceptance of perfective forms of entailment verbs in a factive scenario.

Figure 23 shows that there is an even stronger correlation between perfectivity and factivity (here realized as veridicality) in the case of entailment verbs than in the case of presupposition verbs. This suggests that it is not the type / 'strength' of the truth-inference itself (presupposition, entailment or implicature), but rather some event-structural properties of the matrix predicate that determine the exact direction of the perfectivity-factivity dependency. As already pointed out, it seems that incrementality (Dowty 1991, Krifka 1992) plays a crucial role here. I will come back to this issue in a further part of the paper.

The acceptance rates ('ideal' or A2) for the perfective verbs of revealing/verbs of proving are as follows: 98% for *udowodnić* and *potwierdzić*, respectively (0% rejection), 96% for *dowieść* and *wykazać*, respectively (0% rejection), and 90% for *pokazać* (also 0% rejection). We can see that, independently of the verb lexeme used, the perfective is always an ideal candidate for the factive scenario. It is worth mentioning that even the clause-embedding *pokazać* 'show' was judged as factive.

10.3.2.2 The imperfective in a factive scenario

The imperfective counterparts of the analyzed reveal-type predicates also scored as expected, see Figure 24.

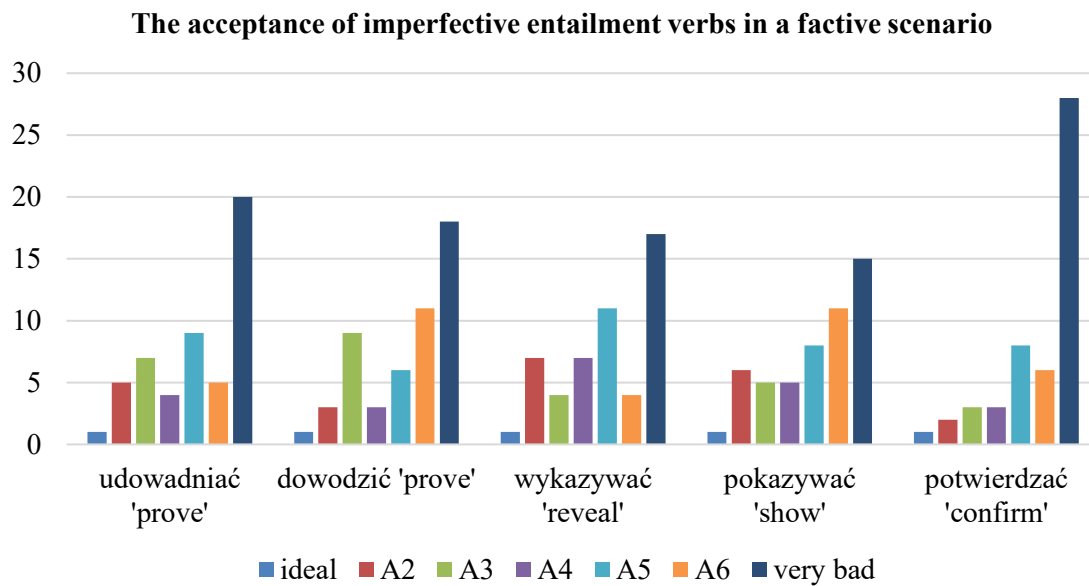**The acceptance of imperfective entailment verbs in a factive scenario**

Figure 24: The acceptance of imperfective forms of entailment verbs in a factive scenario.

All imperfective verbs tend to be rejected in a factive scenario (judgements A6 or 'very bad'): *potwierdzać* by 67% of the participants, *dowodzić* by 57%, *pokazywać* by 51%, *udowadniać* by 49%, and *wykazywać* by 41%. However, there were also some participants who maximally accepted the imperfective (by choosing 'ideal' or A2): 16% for *wykazywać*, 14% for *pokazywać*, 12% for *udowadniać*, 8% for *dowodzić*, and 6% for *potwierdzać*. The remaining participants judged it as average (by choosing A3, A4 or A5). These findings suggest that the imperfective forms of verbs of revealing in Polish are neither ideal nor very bad in a factive scenario. As has already been pointed out, this might be due to the fact that they are less informative in this context than their perfective counterparts. The degree of rejection seems to be determined by the degree of sensitivity towards the effect of the Maxim of Quantity, which varies from person to person.

10.3.2.3 The perfective in a non-factive scenario

In this section I will demonstrate the results for entailment verbs in a non-factive scenario. Consider Figure 25 for the perfective.

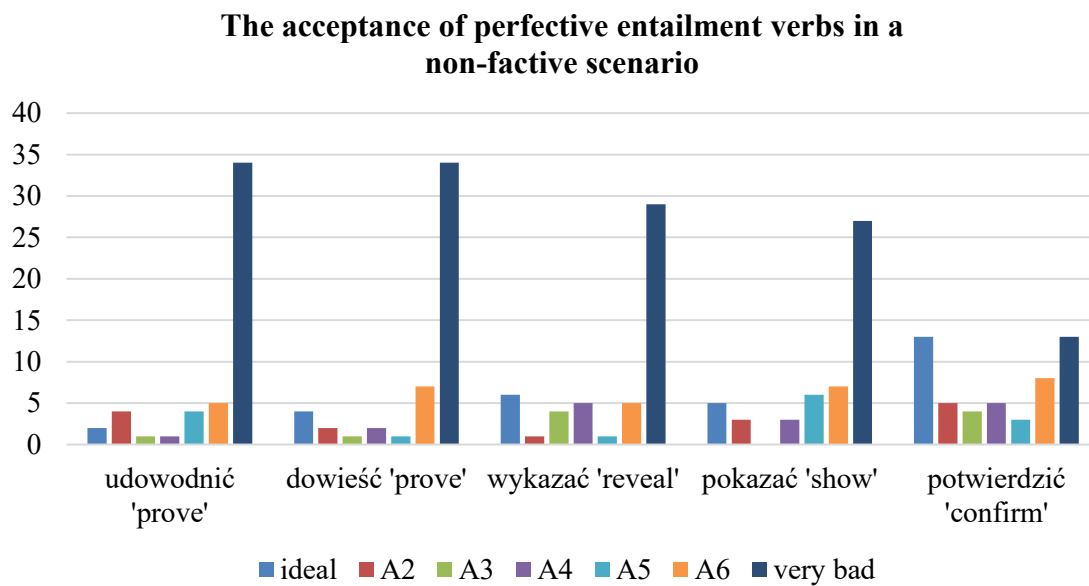## The acceptance of perfective entailment verbs in a non-factive scenario

Figure 25: The acceptance of perfective forms of entailment verbs in a non-factive scenario.

As Figure 25 demonstrates, the participants clearly rejected the perfective forms of entailment verbs in a non-factive scenario. The ratings A6 and 'very bad' were distributed as follows: 81% for *dowieść*, 77% for *udowodnić*, 67% for *wykazać* and *pokazać*, respectively, and 41% for *potwierdzić*.

There are interesting differences in acceptability between the standard verbs of proving (*dowieść* and *udowodnić*), other reveal-type predicates (*wykazać* and *pokazać*), and *potwierdzić* (a weakly veridical verb without the evidence-based character of the closure of the verbal process). Putting it more precisely, all these verbs seem to be incremental theme verbs at first sight, but they differ in the semantic nature of the result of the incremental process. If partial evidence that leads to the truth of *p* comes from the proving process (investigation), we can observe the highest rejection rate of the perfective in a non-factive context. For instance, the incrementality of *to prove that Max is in Tokyo* can be described as follows: we have four pieces of evidence which, taken together, count as **a sufficient evidence** to the effect that Max is in Tokyo: partial evidence 1: *Max is not in Paris*, partial evidence 2: *Max switched off his French phone*, partial evidence 3: *Max switched on his Japanese phone*, partial evidence 4: *Max bought tickets to Tokyo last week*.

In contrast, in the case of other reveal-type predicates, **the amount of evidence available is enough to take the truth of *p* for granted, but it is more likely for a counterexample to appear, since single events are weaker than proving events**. This explains why, in a non-factive scenario, the rejection rate of *wykazać* and *pokazać* was lower than the rejection rate of *dowieść* and *udowodnić*, although all four lexemes received a comparable acceptance rate in a factive scenario.

Finally, the lowest rejection rate, which was observed for *potwierdzić*, might result from the **subjective (or non-verifiable) nature of evidence (or the lack of evidence)**. For

instance, *to confirm that Max is in Tokyo* does not have to involve any kind of investigation/logical reasoning. One can confirm something which is wrong, while being aware of the fact that it is wrong:

(366)   Jan confirmed that Anna was in Spain, although she was in Austria, and he knew about that {about the fact that Anna was in Austria}.

It is impossible to do that with *prove* though:

(367)   #Jan proved that Anna was in Spain, although she was not there, and he knew about that {about the fact that she was not there}.

It seems reasonable to introduce a more fine-grained factivity scale within perfective incremental theme verbs, based on the nature of the incremental process itself.

The question arises as to what extent *potwierdzić* should be treated as an incremental theme verb at all. As example (368) demonstrates, it does not necessarily build on any partial actions, and it can refer to a punctual event:

(368)   Jan just confirmed that Anna got fired, without having proved it at all.

Furthermore, *confirm* (and the Polish aspectual pair *potwierdzić – potwierdzać*), in contrast to the reveal-type predicates, presuppose that *p* is/was part of the common ground. 'Confirm' neither presupposes nor entails that *p* is true though. Consider the following examples.

(369)   #Jan just confirmed that Anna got fired, without having heard it before.

(370)   Jan just proved that Anna got fired, without having heard it before.

In other words, propositions embedded under *confirm* count as discourse-given. Discourse-givenness can, but need not give rise to factivity or veridicality (cf. the influence of correlates on the veridical interpretation of a complement sentence: Schwabe 2013, Schwabe & Fittler 2014 for German, Egré 2008 for English, but also the lack of that effect in Hungarian: Cuba & Ürögdi 2010).

The givenness-presupposition of 'confirm' might also be the reason for the relatively low acceptance rate for the imperfective *potwierdzać* in a non-factive environment (see the next subsection). The verb might be preferred in an iterative scenario, which was excluded via the context description.

To conclude, the fact that *potwierdzić* scores and behaves differently from all reveal-type predicates speaks against its incremental character. For that reason, a post-hoc analysis of incremental theme verbs was conducted (see section 11). In particular, 'confirm' was added to the communication group. This step can be motivated by the

fact that the basis for derivation of this aspectual pair is the simple verb *twierdzić* 'to claim.IPFV' / 'to assert.IPFV' (with its perfective counterpart *s-twierdzić*). This suggests that *po-twierdzić / po-twierdzać* are still instances of verbs of communication / inherited some features of these verbs.

Since in every case except for the pair *dowieść – dowodzić* the perfective is more frequent than its imperfective counterpart, frequency seems not to have had an influence on the speakers' judgements.

In the following, I will present the results for the imperfective entailment verbs in a non-factive scenario.

10.3.2.4 The imperfective in a non-factive scenario

The acceptance of imperfective entailment verbs in a non-factive scenario
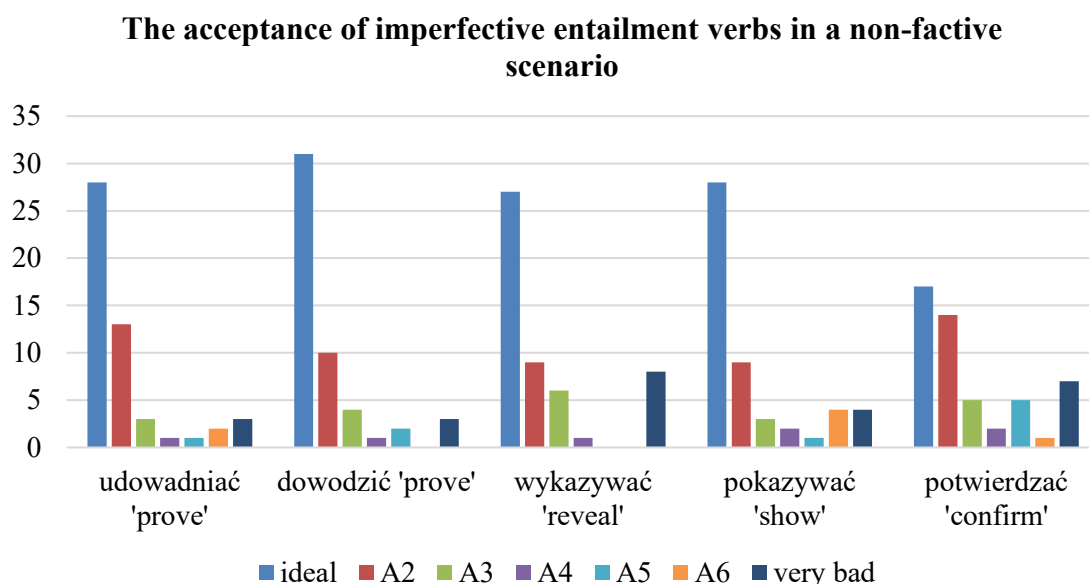
Figure 26: The acceptance of imperfective forms of entailment verbs in a non-factive scenario.

All imperfective entailment verbs received very high acceptance rates in a non-factive scenario. The ratings 'ideal' or A2 were given to the respective verb lexemes by the following number of participants: 81% for *dowodzić*, 80% for *udowadniać*, 73% for *pokazywać*, 71% for *wykazywać*, and 60% for *potwierdzać*. As was observed for the perfective, also in the case of the imperfective we can see differences between verbs of proving, verbs of revealing, and *confirm*. As mentioned before, the relatively low acceptance rate for *confirm* might be due to the fact that its preferred interpretation is the iterative one (where the action described by a verbal predicate is being repeated, for instance: *to be confirming a hundred times*, *to be confirming since yesterday*). In order to avoid the possibility of using the imperfective in the domain of the perfective, the scenarios suggested the singular character of events. As a result, an iterative interpretation was excluded.

To sum up, perfective incremental theme matrix verbs, in contrast to their imperfective counterparts, are systematically veridical with respect to the meaning of propositions they embed.

Perfective forms of incremental theme verbs are clearly accepted in factive scenarios, and clearly rejected in non-factive ones. Imperfective forms tend to be rejected in factive contexts (they are still not completely ruled out, though), and they are clearly accepted in non-factive contexts.

Again, the fact that, in a non-factive environment, the perfective *confirm* scored differently than the prove-/reveal-type predicates, suggests that it is not perfectivity itself, but rather perfectivity combined with incrementality that yields an entailment pattern. Furthermore, the results of the experiment and the judgements presented in examples (366), (367) and (368) question the incremental character of *confirm*.

10.3.3 Implicature group

10.3.3.1 The perfective in a factive scenario

In this chapter, I am going to discuss the results for the last group – the verbs of communication.

Figure 27 presents the judgements for the perfective in a factive scenario.
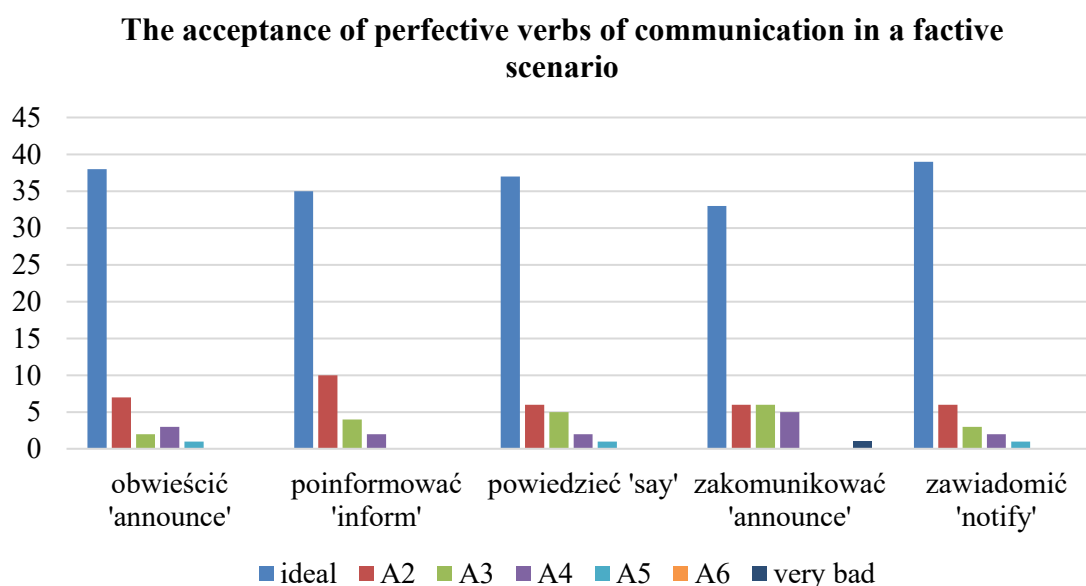

Figure 27: The acceptance of perfective forms of verbs of communication in a factive scenario.

As expected, and as was observed for the previous two groups of verbs, the perfective forms of verbs of communication are perfectly acceptable in a factive scenario. The following number of participants rated them as 'ideal' or A2: 89% in the case of *obwieścić* and *poinformować*, respectively, 88% in the case of *zawiadomić*, 85% in the case of *powiedzieć*, and 77% in the case of *zakomunikować*.

10.3.3.2 The imperfective in a factive scenario

Interestingly, many imperfective twins of the perfective verbs listed in Figure 27 also received high acceptance rates in a factive scenario. The results are summarized in Figure 28.

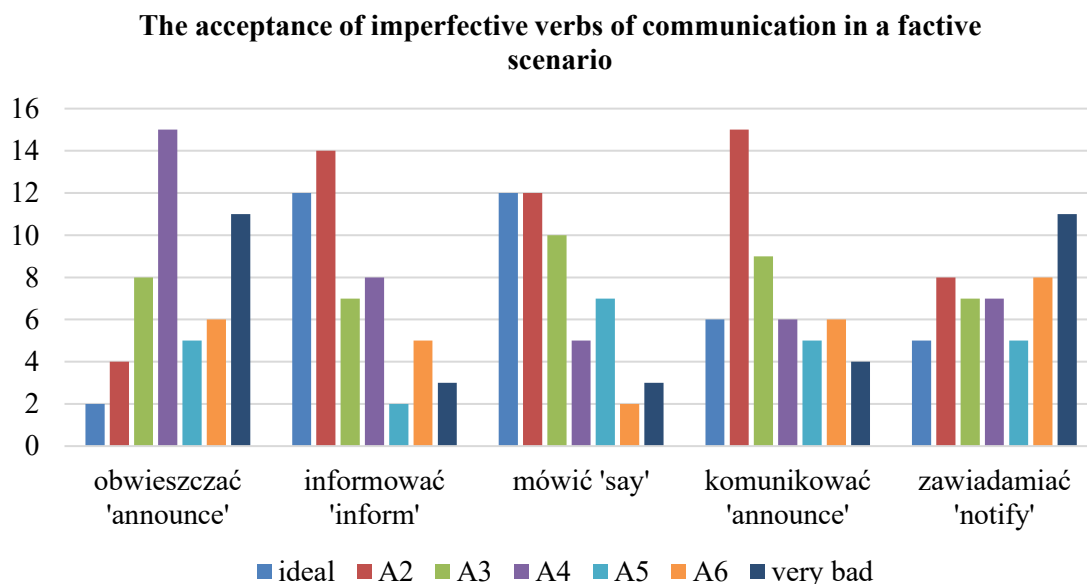**The acceptance of imperfective verbs of communication in a factive scenario**

Figure 28: The acceptance of imperfective forms of verbs of communication in a factive scenario.

Figure 28 shows that the imperfective did not tend to be rejected in a factive scenario. The ratings for the complete rejection (A6 and 'very bad') were distributed as follows: 38% for *zawiadamiać*, 34% for *obwieszczać*, 20% for *komunikować*, 16% for *informować*, and 10% for *mówić*. In contrast, many of the above-mentioned lexemes received a high acceptance rate. The following percentage of participants judged them as 'ideal' or A2: 51% in the case of *informować*, 48% in the case of *mówić*, 41% in the case of *komunikować*, 26% in the case of *zawiadamiać*, and 12% in the case of *obwieszczać*.

Relatively high rejection rates for *obwieszczać* and *zawiadamiać* might also result from their low frequencies (393 occurrences of *obwieszczać* by 690 occurrences of *obwieścić*, and 1696 occurrences of *zawiadamiać* by 4393 occurrences of *zawiadomić*). These are the lowest numbers within the communication group; for comparison, there are 282514 occurrences of *powiedzieć* and 436927 of its imperfective twin *mówić*.

These results suggest that, although the perfective is still a better variant for the factive scenario, the imperfective can be its well-matched competitor.

Crucially, even if the quantitative differences in acceptability between the two aspectual forms of communication verbs were lower than in the case of the entailment group, the perfective members of the respective pairs were always better than their imperfective

counterparts (the difference was significant too). This speaks in favor of the initial hypothesis.

It is worth mentioning that the morphological structure of imperfective communication verbs clearly influences their acceptance in a factive scenario. If the imperfective verb is a basis for aspectual derivation (*informować* and *komunikować*; their perfective counterparts are being created via *po-* and *za-* prefixation, respectively) or a suppletive form (*mówić*), it fits well in the factive environment. However, if it is a derivate (*zawiadamiać* and *obwieszczać*; derived from *zawiadomić* and *obwieścić* via morphonological change, cf. Młynarczyk 2004 for the terminology), its acceptance in a factive context decreases.

In the following, I will compare the results for the (im)perfective communication verbs in a non-factive scenario.

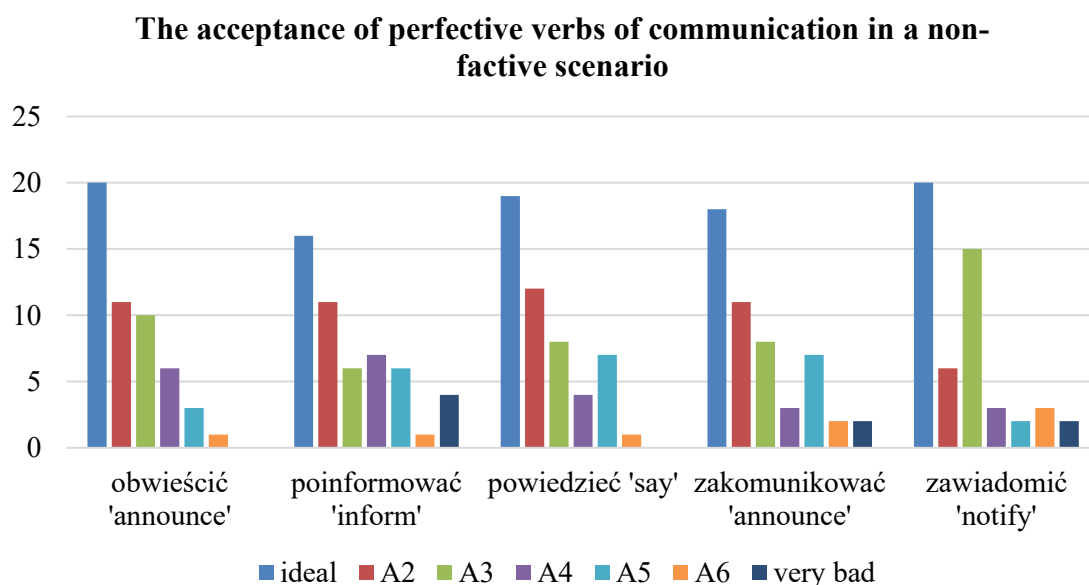10.3.3.3 The perfective in a non-factive scenario

Figure 29: The acceptance of perfective forms of verbs of communication in a non-factive scenario.

Interestingly (and unexpectedly), perfective forms of communication verbs are hardly ever rejected in a non-factive scenario. I will concentrate on their acceptance rates ('ideal' and A2) in order to directly compare them to those of the imperfective counterparts. Rejection rates (A6 and 'very bad') are given in brackets.

In a non-factive scenario, 61% of the participants perfectly accepted *obwieścić* and *powiedzieć*, respectively (only 2% rejection each), 57% *zakomunikować* (8% rejection), 51% *zawiadomić* (10% rejection), and 53% *poinformować* (10% rejection).

10.3.3.4 The imperfective in a non-factive scenario

Figure 30 summarizes the results for the imperfective communication verbs in a non-factive scenario.

The acceptance of imperfective verbs of communication in a non-factive scenario
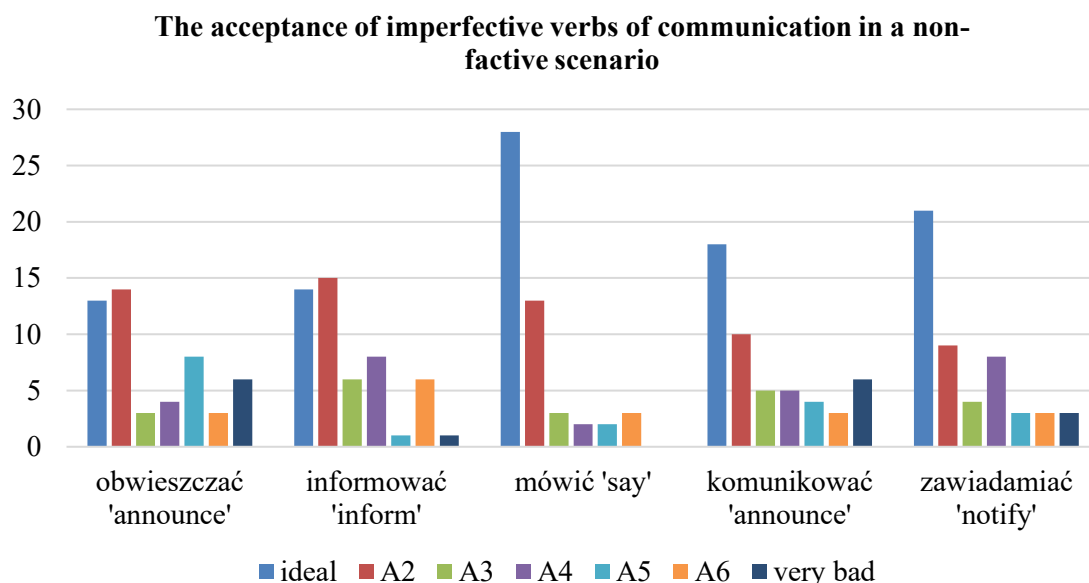

Figure 30: The acceptance of imperfective forms of verbs of communication in a non-factive scenario.

As expected, the imperfective verbs of communication tend to be associated with a non-factive environment. The highest acceptance rates ('ideal' and A2) were distributed as follows: 80% for *mówić*, 59% for *zawiadamiać*, 56% for *informować*, 55% for *komunikować*, and 52% for *obwieszczać*.

Surprisingly, the perfective *obwieścić* is better than the imperfective *obwieszczać* in a non-factive scenario. It seems that *obwieszczać* scored lower due to its archaic form and very low frequency. However, the rejection rate of *obwieszczać* was much higher in a factive than in a non-factive scenario. This shows that, despite the general tendency towards markedness, *obwieszczać* scores better when used in a non-factive context. *Poinformować* and *zakomunikować* behave on a par with their imperfective twins in a non-factive context. The imperfective *mówić* and *zawiadamiać* received a higher acceptance rate in a non-factive scenario than their perfective counterparts. Another reason for higher rejection rates of some imperfective verbs might lie in the speakers' preference towards an iterative interpretation (especially in the case of *zawiadamiać* and *informować*).

To sum up, the perfectivity-factivity dependency within verbs of communication can clearly be seen in a factive scenario. In contrast, the (im)perfective forms are not distributed in a complementary manner in a non-factive environment. This means that the relationship between perfectivity and factivity is weaker in the case of

communication verbs than in the case of the presupposition and the entailment group. Furthermore, the imperfective is more often rejected in a factive than in a non-factive scenario, which confirms its correlation with non-factivity, and the (im)perfectivity – (non)factivity-dependency in general.

10.4 Summary of results

The goal of the experiment was to verify whether there is a systematic relationship between perfectivity and truthfulness. I expected differences in effect sizes depending on the semantic class a matrix verb belongs to. The highest contrast between the perfective and the imperfective with respect to their well-formedness in factive scenarios was expected for the presupposition group, and the lowest for the communication group. However, it turned out that the clearest and strongest effect occurs for incremental theme verbs that are systematically veridical. This reveals the role of internal event-structure in triggering truthfulness. Furthermore, it becomes obvious that a quantized (definite) interpretation of nominal objects of perfective incremental theme verbs translates to their veridical interpretation if the argument is realized as a proposition. This, in turn, suggests a correlation between definiteness and veridicality. Importantly, all perfective incremental theme verbs are bases for aspectual derivation.

Thus, the results indicate that the behaviour of the predicates regarding projection pattern (truth-inference's survival in question constructions, under negation or after the insertion of a modal adverbial) that was the basis for the establishment of the three verb classes is not the primary source of the actual size of the effect; if this was the case, the most significant results should have arisen with presupposition verbs.

In general, regardless of belonging to a particular verb group, the perfective clause-embedding verbs investigated in this dissertation unquestionably favor factive environments. Even more importantly, they are clearly rejected in non-factive scenarios within the presupposition and the entailment groups. Perfective communication verbs are compatible with both a factive and a non-factive context (the judgements are more scattered in the latter case, however). Crucially, if the imperfective is a derivate, its acceptance in a factive scenario decreases. This, in turn, suggests the relationship between morphological formation patterns and factivity. If the perfective is a basis for aspectual derivation, the factivity-based contrast between (im)perfective forms becomes more obvious.

Imperfective clause-embedding verbs in Polish are most compatible with non-factive scenarios. This does not mean, however, that they do not allow for factive readings; for instance, we saw that some imperfective presupposition verbs are ambiguous between a factive and a non-factive interpretation.

Due to the unambiguousness of results for incremental theme verbs and the parallel to the corresponding nominal arguments, I will provide an explanation for the veridicality of this verb class based on its event-structural properties. It seems that the truthfulness of the perfective cannot be explained in isolation (in the sense that there might be an independent motivation for it within each verb group) even if there is a general tendency for the perfective to denote true propositions. This tendency most probably results from completedness / any sort of temporal limitation that constitutes the basic meaning of perfectivity.

Furthermore, the results suggest that CPs exhibit more complex structure than DPs. Whereas the meaning of nominal arguments of incremental theme verbs is easily accessible (it is the DP itself that undergoes an incremental change), we need additional 'invisible' steps in order to access the meanings of CPs that constitute single pieces of evidence in a proof chain (it is more than 'just' a that-clause that gives rise to incrementality). In other words, composing proof seems more complex than composing a DP. A detailed investigation on this topic will be the subject of future research.

In the next chapter, I will present a post-hoc analysis of slightly reorganized verb classes.

10.5   Note on the role of the Aktionsarten in triggering truth-inference of the perfective

As was shown for Polish (im)perfective 'guess', Aktionsarten may influence the realization of the truthfulness feature. Since both *zgadnąć* 'guess.PFV' and *zgadywać* 'guess.IPFV' are achievements, there is no way for the perfective to access / build on the meaning of the imperfective (the perfective cannot mark the closure of an event that is inherently punctual). Thus, the perfective cannot fulfill its default function as completedness marker. It seems that, in this particular case, perfectivity is obligatorily parametrized by factivity. Clause-embedding achievements tend to be factive in general; both perfective factive 'sensing'-verbs – *wyczuć* and *przeczuć* – are state-based achievements (cf. Zuchewicz & Šimík 2018).

Furthermore, it can be observed that inchoativity systematically blocks factivity. As previously shown, *wyczuć* and *przeczuć* 'sense' are factive verbs. Both of them denote a resultative Aktionsart. Crucially, their imperfective stem *czuć* 'feel' can also combine with the prefix *po-*, giving rise to the inchoative meaning of a derivate ('to start feeling'). In this case, the inference that is triggered by the perfective is at least a weak truth-implicature. Consider the following examples, adapted from Zuchewicz & Šimík (2018).

(371) Przez   chwilę   #wyczułam   /   #przeczułam
through   moment   sensed.1SG.PFV.RES   /   sensed.1SG.PFV.RES
/   poczułam,   że   to   Jan   wysyła   mi   kwiaty,   ale
/   felt.1SG.PFV.INCH   that   it   Jan   sends   me   flowers   but
okazało   się,   że   to   Kuba.
turned.out   REFL   that   it   Kuba
'I started feeling that it was Jan who keeps sending me flowers (and the sense lasted a moment), but it turned out that it was Kuba.'
⤳̸ Jan keeps sending me flowers.

(372) Ale   miałam   wyczucie!
but   had   sensing.PFV.RES
'I have totally sensed it right!'

(373) Ale   miałam   przeczucie![51]
but   had   sensing.PFV.RES
'I have totally sensed it (right)!'

(374) # Ale   miałam   poczucie!
    but   had   feeling.PFV.INCH

(375) Miałam   #wyczucie   /   #przeczucie
had   sensing.PFV.RES   /   sensing.PFV.RES
/   poczucie   winy   /   siły.
/   feeling.PFV.INCH   guilt.GEN   /   power.GEN
'I felt guilty / strong.'

Examples (371)–(374) illustrate that only *poczuć* (and its nominal variant *poczucie*) can refer to temporary events, which indicates their non-factivity. Example (375) further demonstrates that non-verifiable subjective states of mind can only be described by *poczucie*.

According to Zuchewicz & Šimík (2018), the same pattern holds for Czech:

(376) Karel   cítil,   že   Marie   je   doma.
Karel   felt.IPFV   that   Marie   is   at.home
'Karel sensed that Marie was at home.'
⤳̸ Marie was at home.

---

[51] However, as already mentioned, one can still say *Dobrze, że moje przeczucie się nie sprawdziło*. 'Fortunately, my hunch was not right.', but one cannot say #*Dobrze, że moje wyczucie się nie sprawdziło*. This suggests that, while the factivity of *wyczucie* is not affected by the process of nominalization, the noun *przeczucie* can have both a factive and a non-factive reading.

(377) Karel   ucítil   na   tři   minuty,   že   Marie   je
Karel   felt.PFV.INCH   for   three   minutes   that   Marie   is
doma.
at.home.
'Karel started sensing that Marie was at home (and the sense lasted three minutes).'
⫸̸ Marie was at home.

(378) Karel   vycítil   (#na   tři   minuty),   že   Marie   je
Karel   felt.PFV.RES   for   three   minutes   that   Marie   is
doma.
at.home.
'Karel sensed at once that Marie was at home.'
⫸ Marie was at home.

(379) Karel   nevycítil,   že   Marie   je   doma.
Karel   NEG.felt.PFV.RES   that   Marie   is   at.home.
'Karel did not sense that Marie was at home.'
⫸ Marie was at home.

The most apparent relationship holds between incremental accomplishments and veridicality. This relationship is explained in greater detail in section 5.2.1.2.

11 Post-hoc analysis: Exchanging members of two verb groups

Within the scope of the post-hoc analysis, the entailment group was restricted to incremental theme verbs; the pair *potwierdzić – potwierdzać* 'confirm' was removed from the data set. 'Confirm' was added to the communication group instead.

11.1 Entailment group restricted to incremental theme verbs

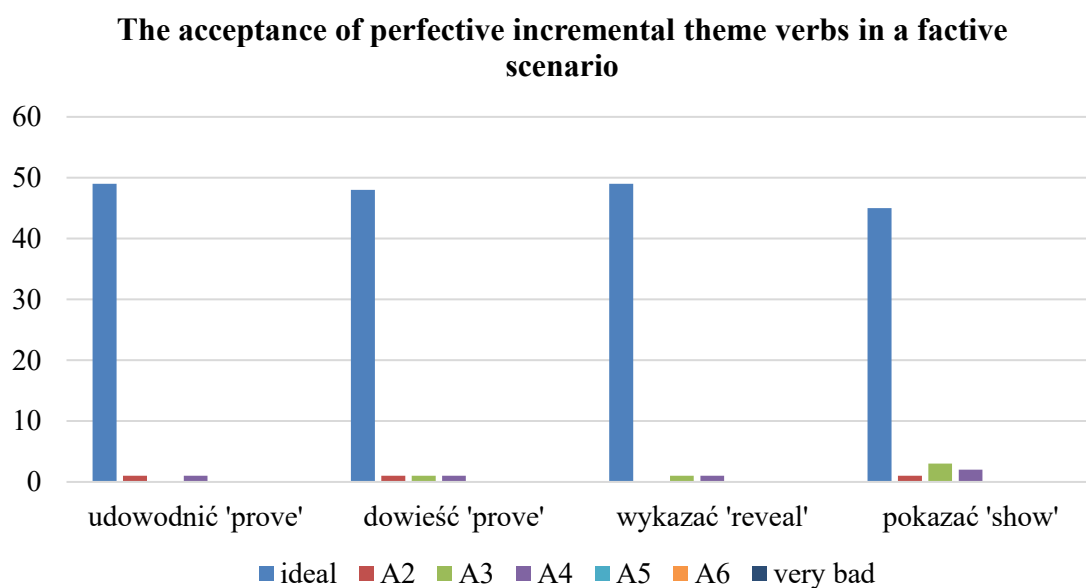### 11.1.1 Perfective incremental theme verbs in a factive scenario

The acceptance of perfective incremental theme verbs in a factive scenario

Figure 31: The acceptance of perfective incremental theme verbs in a factive scenario.

We can see, again, that incremental theme verbs pattern alike in that they are unquestionable veridicality-triggers. The average acceptance rate (ideal + A2) for the four perfective forms in a factive scenario was 95%.

11.1.2 Imperfective incremental theme verbs in a factive scenario

The acceptance of imperfective incremental theme verbs in a factive scenario
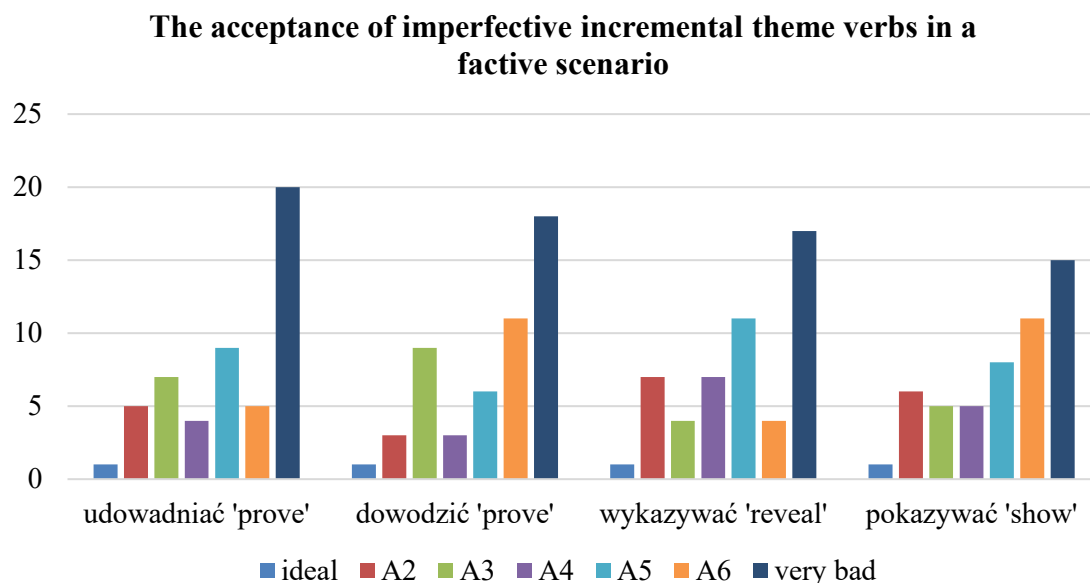

Figure 32: The acceptance of imperfective incremental theme verbs in a factive scenario.

Imperfective incremental theme verbs presented in a factive scenario also pattern alike. The average rejection rate (A6 + very bad) for all lexemes was 50%. In this and the above case, the results for 'confirm' do not differ much from the results for reveal-type predicates.

11.1.3 Perfective incremental theme verbs in a non-factive scenario

The acceptance of perfective incremental theme verbs in a non-factive scenario
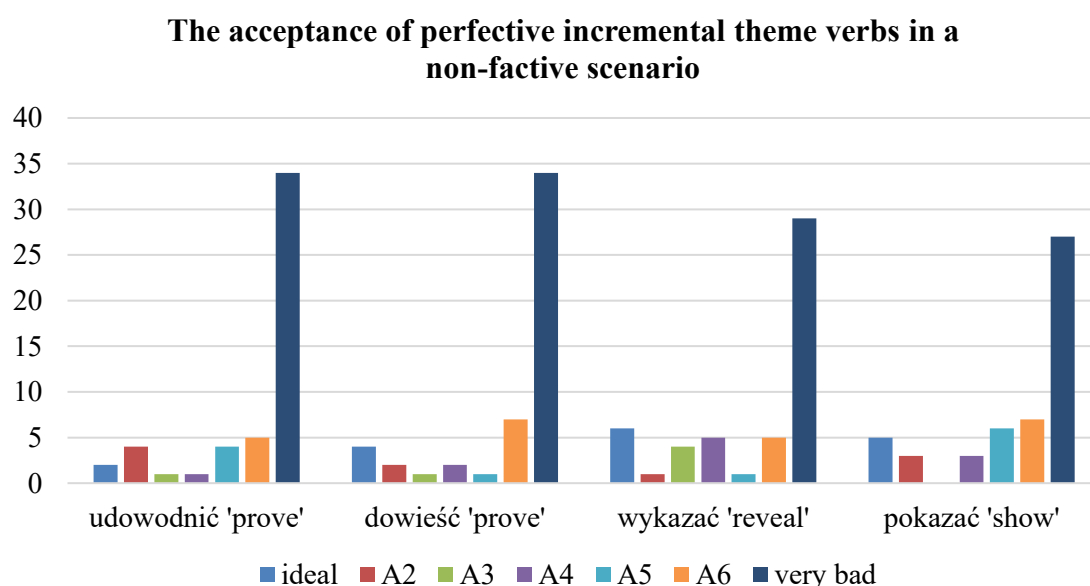

Figure 33: The acceptance of perfective incremental theme verbs in a non-factive scenario.

All perfective variants of reveal-type predicates tend to be rejected in a non-factive

context. The average rejection rate was 73%. The rejection rate would have been lower if 'confirm' had been considered a member of this group.

11.1.4 Imperfective incremental theme verbs in a non-factive scenario

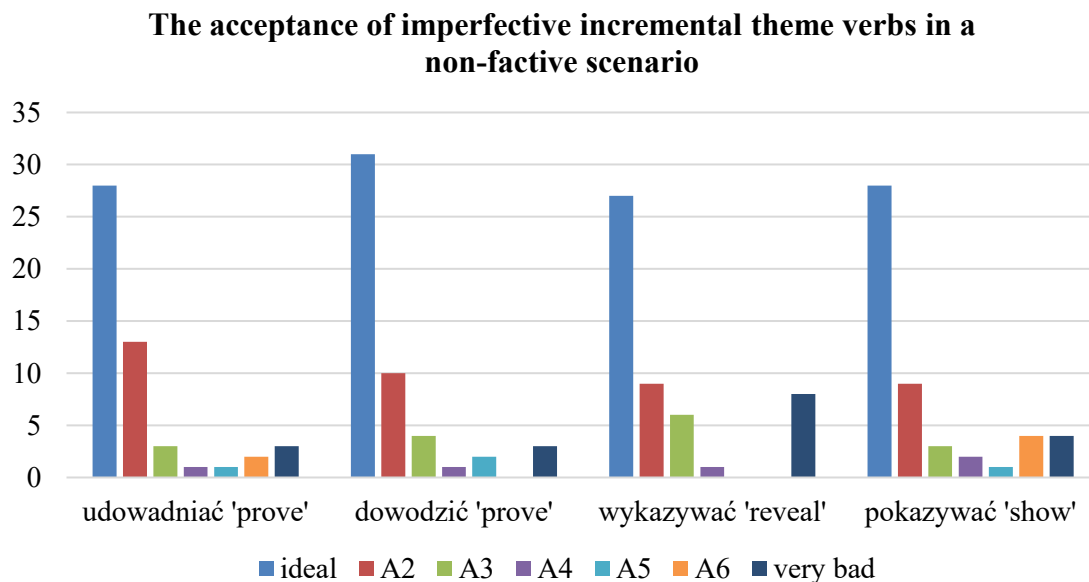**The acceptance of imperfective incremental theme verbs in a non-factive scenario**

Figure 34: The acceptance of imperfective forms of incremental theme verbs in a non-factive scenario.

The results for imperfective incremental theme verbs in a non-factive environment are very consistent too. 76% of the participants gave them maximal acceptance. The results for 'confirm' are below this average (60%). As was mentioned before, the reason for this might lie in the inherent iterativity of *potwierdzać*.

In the following, I will reanalyze verbs of communication by extending this group to include 'confirm'.

11.2 Communication group extended by *confirm*

11.2.1 Perfective communication verbs in a factive scenario

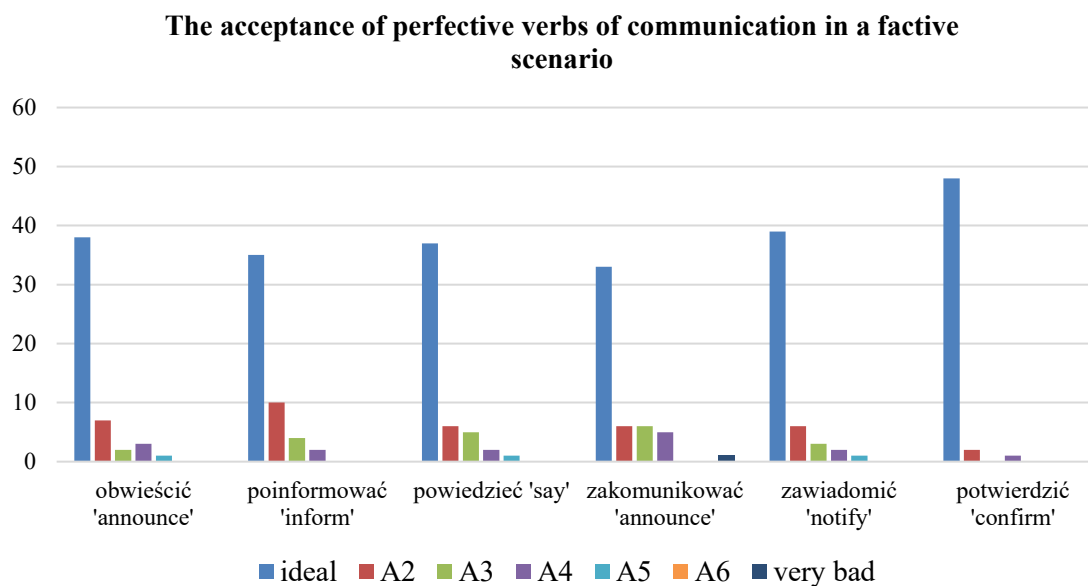**The acceptance of perfective verbs of communication in a factive scenario**

Figure 35: The acceptance of perfective forms of verbs of communication in a factive scenario.

Like other investigated verb groups, perfective verbs of communication also received the highest acceptance rates in a factive scenario. The perfective 'confirm' matches this picture. 87% of the participants ranked perfective communication verbs as ideal.

11.2.2 Imperfective communication verbs in a factive scenario

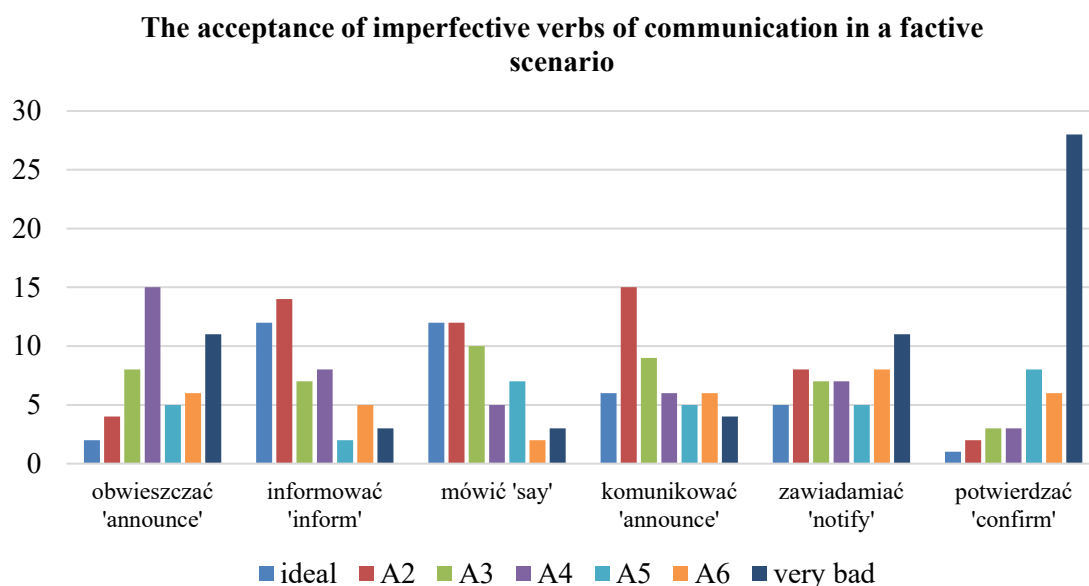**The acceptance of imperfective verbs of communication in a factive scenario**

Figure 36: The acceptance of imperfective forms of verbs of communication in a factive scenario.

As was shown before, imperfective communication verbs are not ruled out in a factive scenario. 'Confirm' patterns differently though; this would suggest the need for the creation a separate group for lexemes that enforce / favor an iterative interpretation of events. In any case, 30% of the participants rejected imperfective forms of verbs of communication in a factive environment. The results for 'confirm' are much above this average (67%).

11.2.3 Perfective communication verbs in a non-factive scenario

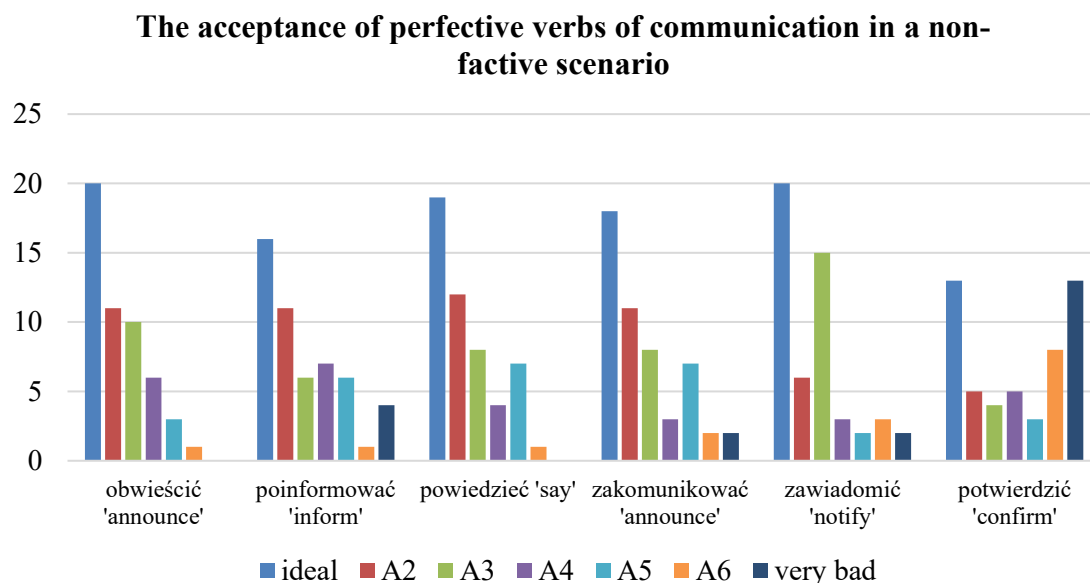**The acceptance of perfective verbs of communication in a non-factive scenario**

Figure 37: The acceptance of perfective forms of verbs of communication in a non-factive scenario.

The above diagram makes it clear, again, that 'confirm' should not be treated as a communication verb. All 'typical' perfective verbs of communication tend to be accepted in a non-factive context. In contrast, the perfective 'confirm' allows for both a factive and a non-factive interpretation (see the main experimental results). Due to this discrepancy, I have decided not to merge the results for this subgroup.

11.2.4 Imperfective communication verbs in a non-factive scenario

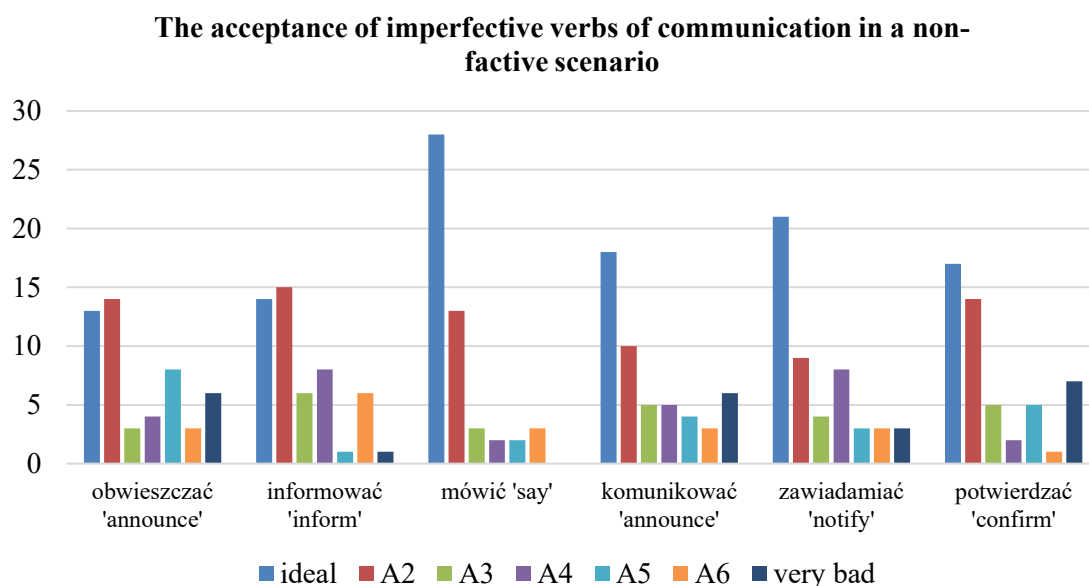**The acceptance of imperfective verbs of communication in a non-factive scenario**

Figure 38: The acceptance of imperfective forms of verbs of communication in a non-factive scenario.

Generally, imperfective verbs of communication are compatible with a non-factive environment, but as was discussed above, lexical properties and frequency might affect the acceptance in particular cases.

The post-hoc analysis revealed that 'confirm' does not behave like other / typical communication verbs in Polish. It seems that it would fit into a group where the difference between the perfective and the imperfective is based on iterativity. The results further show that truth-entailment is restricted to perfective incremental theme verbs, which clearly proves the presence of parallels between the nominal and sentential arguments of these verbs with respect to quantization / veridicality.

In the next section, I will show how to compose a proof.

12 Incrementality revisited

In the following, I will argue that proof has parts. I will draw parallels between 'typical' incremental theme verbs like 'eat (a sandwich)' or 'build (a house)' and clause-embedding reveal-type predicates like 'prove' or 'show'. I will refer to both as incremental theme verbs. Before composing a proof (a justification for assuming incrementality for reveal-type predicates), I will briefly discuss the process of argument creation in natural language. Finally, I will present a unified analysis of incremental theme verbs that take either a nominal or a propositional complement.

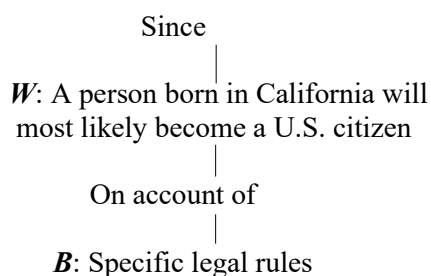## 12.1 Part structures of proof

12.1.1 Background: Argument creation in natural language

Toulmin (1958) and Toulmin (2003) among others investigate the characteristics of legal argumentation processes and propose a scheme for informal argumentation. Toulmin provides a non-formal basis for the assumption that a proposition is interpreted as true if there is a proof for it. He uses the following components for the justification procedure: a datum (D), a warrant (W) and a conclusion (C). In the argumentation process, a datum supports a conclusion. An addressee accepts a datum as a justification / proof for the conclusion if there is a warrant that confirms a valid relation between a datum and a conclusion. Consider the following example.

(380)　(i)　　Anna is a U.S. citizen.
　　　　(ii)　　She was born in California.
　　　　(iii)　　If a person was born in California, she becomes a U.S. citizen.
　　　　(iv)　　A person that was born in the U.S. becomes a citizen at birth. California is a state in the U.S.

In (380), (ii) is a datum for the conclusion (i). Being born in California results in becoming a U.S. citizen. This is due to the warrant (iii); if a person is born in California, she automatically gets U.S. citizenship. A warrant can be supported by further rules (the so-called backing (B) in Toulmin's terminology), cf. (iv). In (380), these rules are specified by law. An argument pattern for (380) is presented in (381).

(381) **D**: Anna was born in California → **C**: So, presumably, Anna is a U.S. citizen.

Since

W: A person born in California will
most likely become a U.S. citizen

On account of

B: Specific legal rules

Adapted from: Toulmin (2003: 97)

Whereas a datum is made explicit, a warrant usually remains implicit because it is presupposed as known. In the case of legal argumentation, backing is based on specific legal rules (factual statements). A different situation is illustrated in (383); here, a warrant is supported by a rule that is a non-mandatory social norm followed by some (but not all) members of a society. For that reason, the addressee can refuse its validity. This is not possible in (380).

(382) (i)   {If you want to recognize him,} Henry will not wear a pink jacket.
       (ii)   He is a boy.
       (iii) If a child is a boy, it does not wear a pink jacket.
       (iv)   It is more common for girls to wear clothes that are pink than for boys.

Since the incremental creation of a proof is based on evidence, it represents a sort of a legal investigation – the addressee cannot refuse a proof. In the following, I will show how to compose a proof in order to access its parts. I will concentrate on the part-structure of proof, because it is crucial for veridicality-based differences in meaning between (im)perfective reveal-type predicates in Polish. Any single piece of evidence that supports a (preliminary) conclusion corresponds to a datum in Toulmin's sense.

12.1.2 Composing a proof

In this section, I will discuss the internal structure of a proof, based on the meaning of (im)perfective reveal-type predicates in Polish. The main contrast between the two aspectual forms lies in implying different amount of evidence for the validity of a that-sentence. The progress of the proving process depends on increasing / strengthening the evidence, i.e. on the incremental creation of evidence. The gradual character of evidence creation justifies calling reveal-type predicates incremental theme verbs and treating them analogously to incremental theme verbs that combine with nouns or nominal arguments denoting entities. In the latter case, the subparts of the object correspond to the subparts of a verbal event. In the former case, single pieces of evidence are linked to particular stages of the proving process.

To begin with, I will clarify the notions of evidence and proof as well as the relationship between them. We can see proofs as sequences of single pieces of evidence. If evidence is sufficient in order to acknowledge a proposition (which in our case is expressed by the that-clause) as true, it is established as a proof. Partial evidence incrementally creates a proof, exactly as the single parts of a house incrementally create a house. Verbs that imply the existence of evidence / partial evidence are for instance 'prove', 'reveal', 'show' (reveal-type predicates in this dissertation). Proof is the sufficient evidence that is available at the time of evaluation. Linking the validity of a proof to the evaluation time is necessary in order to allow for the insertion of a new piece of evidence into the proof-chain. This step is justified by trial scenarios where a person is proven guilty and goes to jail, but is found innocent after years due to the appearance of a new piece of evidence. In these cases, different pieces of evidence yield different proofs, depending on the time of evaluation.

As was mentioned above, proof is an essential component of meaning of reveal-type predicates. A that-sentence embedded under a reveal-type verb denotes a proposition. This proposition is true if there is a proof for it. For instance, to prove that Anna was in Italy means to find a chain / sum of pieces of evidence that yield a proof for Anna's stay in Italy. A proof is only present with the perfective, giving rise to its veridical interpretation. In other words, the perfective, in contrast to the imperfective, implies the existence of a proof (sufficient evidence) for the proposition expressed by the that-clause.

Consider scenario (383) and its illustration in (384). The presence of a proof in the case of the perfective blocks the accessibility of single pieces of evidence, exactly as a complete (built) house / an eaten apple do not allow for accessing parts of the objects. As a result, assertion A automatically reveals conclusion C.

(383) A: Jan proved.PFV that Anna was in Italy.
    a: (evidence such that) Anna booked a flight to Italy.
    b: (evidence such that) Anna was seen in Rome.
    C: Anna was in Italy.

(384)

	a:	b_n[52]:
	Anna booked a flight to Italy.	Anna was seen in Rome.
A: Jan proved.PFV that **(Anna(inItaly))**	C: **Anna(inItaly)**	C: **Anna(inItaly)**
		C: **Anna(inItaly)**[53]

In (384), above the line, single pieces of evidence a and b individually suggest C (marked as ~). Both a and b hold for the assertion A. Under the line, C is the general conclusion for A; b is the final piece of evidence that converts evidence into a proof.

[52] I use $_n$ to indicate that the derivation is closed, i.e. that the crucial piece of evidence has been delivered.

[53] The form of expression is based on Schroeder-Heister (2018: 20).

The length of a proof-chain depends on the dynamics of the proving process and the premises available.

In contrast, since the proving process is still ongoing with the imperfective, the assertion itself does not reveal the conclusion. We can only say what single pieces of evidence suggest – we do not have a proof yet. In other words, the evidence that is available at the evaluation time is not sufficient to establish a proof. Importantly, the quality of single pieces of evidence does not change in the course of the derivation. Only a new piece of evidence could bring a potential counterexample (something that reveals L and not C). It needs to be pointed out that the proof-chain presented here only contains essential evidence (non-eliminable components in a chain). Examples (385) and (386) demonstrate the internal structure of the imperfective 'prove'.

(385)   *A*: Jan proved.IPFV that Anna was in Italy.
         a: (evidence such that) Anna booked a flight to Italy.
         b: (evidence such that) Anna got an Italian SIM-card.
         ...

(386)

	a: Anna booked a flight to Italy.	b: Anna got an Italian SIM-card.	c:
A: Jan proved.IPFV that **(Anna(inItaly))**	*C:* **Anna(inItaly)**	*C:* **Anna(inItaly)**	?

Since single pieces of evidence are not sufficient to establish a proof in the case of the imperfective, the assertion itself does not entail the conclusion in (386); one cannot say more than '*a* is evidence for *C* and *b* is evidence for *C*'. The imperfective leaves the conclusion open.

To sum up, only perfective clause-embedding reveal-type predicates in Polish imply the existence of a proof, i.e. sufficient evidence for the validity of an embedded proposition. Consider the internal structure of the perfective (387), single steps in a proof-chain (388), omitting single steps (389) and elimination of single steps (390) that hold for the perfective.

(387)

$$\text{EVIDENCE} \in \text{PROOF} \ [\![\text{PROOF}]\!] \quad \left\{ \begin{array}{l} C \ \leftarrow \ \text{a (partial evidence a)} \\ C \ \leftarrow \ b_{2/n} \text{ (partial / crucial evidence b)} \end{array} \right.$$

(388) $\overbrace{\text{a}}$ $\overbrace{\text{b}}$
         C C

(389)
$$\begin{array}{ccccc} & a & \dots & b_n & \\ \underline{A \qquad C \qquad \dots \qquad C} \\ & & C & & \end{array}$$

(390)
$$\frac{A}{C}$$

The imperfective, defined as in (391), only allows for establishing conclusions that might be drawn from single steps in a proof-chain (392). As was mentioned above, there could be a new piece of evidence c that does not lead to C, but to something else.

(391)

$$\text{EVIDENCE} \notin \text{PROOF} \quad [\![\text{EVIDENCE}]\!] \quad \begin{bmatrix} C & \leftarrow & a \text{ (partial evidence a)} \\ C & \leftarrow & b \text{ (partial evidence b)} \\ ? & \dots & c \text{ (partial evidence c)} \end{bmatrix}$$

(392)
$$\begin{array}{cccccc} a & b & c & \dots & \triangle \\ \smile & \smile & \smile & & \smile \\ C & C & C & \dots & ? \end{array}$$

In the next section, I will propose a unified analysis for incremental theme verbs that combine with both nouns and clauses.

The question arises whether there is any part structure in the case of the communication and the presupposition group. With the former, one could imagine two levels of partition: first, the mapping between what has been said and a particular time span that relates to the uttered part of information (i.e. a linearized order of the production of single pieces of an utterance with prosodic boundaries between these pieces) and second, speech-act-based partition that refers to the (non-)realization of all parts of the speech-act. Crucially, in both cases, it is not the content of an embedded proposition itself that has parts. With presupposition verbs, assuming partition seems more problematic, since the perfective and the imperfective tend to be achievements. One could think of a part structure for *przeczuwać*.IPFV – *przeczuć*.PFV and *wyczuwać*.IPFV – *wyczuć*.PFV 'sense', where a gradual process of collecting hints leads to sensing something right. However, we have seen that the imperfective variants can have a factive interpretation too, which means that the perfective does not necessarily build on the meaning of the imperfective. From that it follows that a systematic content-based partition can only be stated for reveal-type predicates.

12.2 My unified aspect-driven analysis of Polish incremental theme verbs that take both nominal and propositional complements

The starting point for my analysis builds the core meaning of (im)perfective incremental theme verbs like *(prze)czytać* 'read' or *(z)budować* 'build' in combination with their incremental themes *książka* 'book' or *dom* 'house'. Let us assume the part structure for objects and events as shown in (393).

(393)
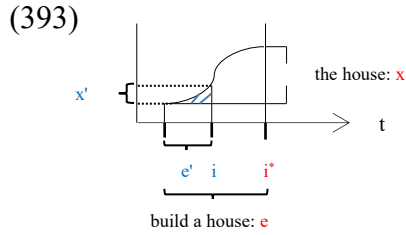
x represents a house that could be built (but does not exist yet), and *x'* stands for some already created parts of that house. According to (393), there is a part of the house *x'* at the evaluation time *i*. The existence of an object at the evaluation time *i** would imply the existence of a house. Parts of the object are mapped to parts of building events and vice versa.

I will introduce the REAL-operator. In its scope, it contains (parts of) objects / events that are realized (built, read, eaten, proven, etc.) at the time of evaluation. Importantly, realization need not mean creation. It refers to any kind of affectedness of the object by the verbal process. Consider (394) – the representation of the situation described in (393). (394) says that a partial building event *e'* was realized at the evaluation time *i*. It captures the meaning of the English sentence *He was building a house (i), but he did not finish yet (i*)* and its Polish equivalent *Jan budował.*IPFV *dom (i), ale jeszcze nie skończył (i*)*.

(394) $\lambda e'\lambda e[\text{build}(e) \wedge e' \sqsubseteq e \wedge \text{REAL}(i)(e')]$[54]

Mapping to objects and mapping to events ensure that the existence of partial events implies the existence of partial objects and vice versa. Since the analysis I propose

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[54] The question arises whether the notion of saying that a partial event is real requires some form of branching time structure. In my opinion, branching time structure is not necessary in order to capture the basic semantics of (im)perfective incremental theme verbs. Imperfective incremental theme verbs imply the realization of partial events, whereas their perfective counterparts block partition / imply the realization of complete events. Branching time structure makes it possible to specify partition more precisely, for instance in cases like: *Yesterday he built one part of the house, and today the other part, but the entire house is still not ready, he is still building it*. This could be a possible extension of my analysis.

applies to incremental theme verbs, mapping to objects and mapping to events are implicit rules that govern the interpretation of the formulas.

In line with Neo-Davidsonian event semantics (Castañeda 1967, Carlson 1984, Parsons 1990, Krifka 1992, Champollion 2016 among others), I am only introducing variables for events; arguments of the verb (both nominal and propositional) are represented as relations to events (here via the PAT-relation). Neo-Davidsonian semantics treats all types of arguments alike, which makes it a perfect approach for analyzing incremental theme verbs that take both nominal and propositional complements.

Starting with (im)perfective incremental theme verbs that take nominal complements, the perfective implies the realization of a complete event e in the world of evaluation w_0, consider (395) for 'read.PFV a book'. (395) is to be read as follows: Lambda e, e is an event of reading that is completely realized in w_0 and a book is a patient of e in w_0. Since the complete event is realized in the case of the perfective, and since a patient argument is linked to the complete event, the entire patient is necessarily realized too. Furthermore, the lack of accessibility of partial events implies the lack of accessibility of partial objects (here single parts of the book).

(395) **in w_0:**
$\lambda e[\text{przeczytać}(w_0)^{55}(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,\text{książka})]$

with existential closure:
$\exists e[\text{przeczytać}(w_0)(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,\text{książka})]$

(396) shows the single steps in the derivation. Step (5) is the final result before the application of the existential closure. The REAL-condition is introduced by aspectual operators that also require its boundedness to the world of evaluation. As was mentioned before, the perfective enforces the realization of a complete event (step 3). The derivation itself (from (1) to (5)) is simple and corresponds to the standard assumptions on aspectual composition: Both the perfective and the imperfective take a VP as an argument by building the aspect phrase (step 4). Aspectual composition does not show the single steps in the proof chain, which is why we have to distinguish between aspectual composition and composing a proof.

(396) **AspP** $(5)= \lambda e[\text{przeczytać}(w_0)(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,\text{książka})]$
$(4)= \lambda P \lambda e[P(w_0)(e) \wedge \text{REAL}(w_0)(e)](\lambda e[\text{przeczytać}(e) \wedge \text{PAT}(e,\text{książka})])$
Asp$_{\text{PFV}}$ $(3)= \lambda P \lambda e[P(w_0)(e) \wedge \text{REAL}(w_0)(e)]$
VP $(2)= \lambda e[\text{przeczytać}(e) \wedge \text{PAT}(e,\text{książka})]$
V $(1)= \lambda P \lambda e[P(e)](\text{przeczytać})$

In contrast, the imperfective only implies the realization of some partial event(s) e' in w_0. (397) is to be read as follows: Lambda e', lambda e, e is a reading event[56] that has a

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[55] I am treating w_0 as a free variable.

partial event *e'* that is realized in w_0 and a book is a patient of *e* in w_0. As was mentioned above, if there is a partial event, there needs to be a corresponding partial object too. Since the patient argument is in the relation to a complete event, and since only parts of that event are realized at the evaluation time, there have to be parts of the object that are affected by the realized parts of the event. Compare (397) and (398) for 'read.IPFV a book'. The realized parts of the object are the parts of the book that are read.[57]

(397) **in w_0:**
$\lambda e'\lambda e[czytać(w_0)(e) \wedge e'\sqsubseteq e \wedge REAL(w_0)(e') \wedge PAT(w_0)(e,książka)]$

with existential closure:
$\exists e'\exists e[czytać(w_0)(e) \wedge e'\sqsubseteq e \wedge REAL(w_0)(e') \wedge PAT(w_0)(e,książka)]$

The only difference in the derivation compared to the perfective is the introduction of the realization of partial events and its boundedness to the world of evaluation (step (3) in (398)).

(398)   **AspP** $(5)= \lambda e'\lambda e[czytać(w_0)(e) \wedge e'\sqsubseteq e \wedge REAL(w_0)(e') \wedge PAT(w_0)(e,książka)]$
                  $(4)= \lambda P\lambda e'\lambda e[P(w_0)(e) \wedge e'\sqsubseteq e \wedge REAL(w_0)(e')](\lambda e[czytać(e) \wedge PAT(e,książka)])$
  Asp_{IPFV} $(3)= \lambda P\lambda e'\lambda e[P(e) \wedge e'\sqsubseteq e \wedge REAL(w_0)(e')]$[58]
  VP $(2)= \lambda e[czytać(e) \wedge PAT(e,książka)]$
  V $(1)= \lambda P\lambda e[P(e)](czytać)$

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[56] Even if an event is still ongoing with the imperfective, I assume that there is an (abstract) proving-ideal that implies a complete realization of that event, i.e. the existence of a proof for an embedded proposition. This proving-ideal is the basis for defining realized parts of events denoted by imperfective reveal-type predicates.

[57] Importantly, the PAT-restriction is not meant to enforce the existence of a direct object in the world of evaluation, which is crucial for gradual effected patients, as in: 'write a book' or 'build a house'. In the case of the imperfective variants, the physical existence only applies to parts of an object. The PAT-condition says that an incremental event needs an incremental theme in order to be instantiated. The REAL-condition specifies to what extent an incremental event has been realized in the world of evaluation, and lexical properties of the VP determine whether the existence of an object depends on the existence of an event or not. For example, in the case of 'write a book', PAT says that 'a book' – to be understood as a particular object – enables the realization of a writing-event and contributes to its natural culmination (an event of writing cannot take place without an object that is being written). PAT further refers to an ideal development of an event; in the above-mentioned example, the completion of the process of writing implies the existence of a book.

[58] The fact that realization of subevents needs to be assumed for imperfective incremental theme verbs results from the unacceptability of sentences like #*Czytał.*IPFV *książkę, ale nawet nie zaczął* 'He was reading a book, but he did not even start {reading it}.' / #*Udowadniał.*IPFV*, że Iza nie pracuje należycie, ale nawet się do tego nie zabrał* 'He was proving that Iza is not working appropriately, but he did not even get down to it.'

The advantage of this analysis is that it does not define how homomorphism from objects to events is to be realized. In other words, it does not enforce the object to be divided into parts. It only enforces a relation between parts of events and parts of objects, but the partition can be stated on a more abstract / indirect level as proposed in the standard analyses for incremental themes. This makes it possible to include propositional complements in the analysis.

As was mentioned above, the incremental character of reveal-type predicates is based on the composing of a proof. The proof consists of single pieces of evidence / proof steps. Composing a proof can be compared to the creation of a new object. For example, we can build a bed from parts bought at Ikea or collected in a forest. Both options can result in the creation of a bed – there are many possible ways of constructing x. Similarly, there are many possible ways of proving p. As was said above, imperfective reveal-type predicates imply the existence of some pieces of evidence that are not sufficient to establish a proof. In contrast, sufficient amounts of evidence are turned into a proof in the case of the perfective counterparts. More precisely, the latter are veridical, because they imply the existence of a proof for the proposition expressed by the subordinate clause.

Imagine a proof-chain as shown in (399).

(399)
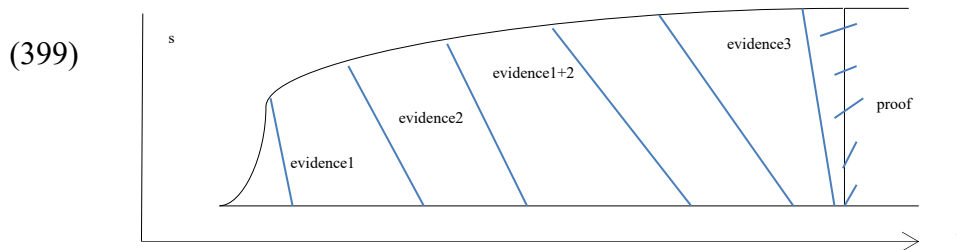
In contrast to a mathematical proof (Schroeder-Heister 1991, Martin-Löf 1998, Schroeder-Heister 2006 among others), the truth of a proposition embedded under a reveal-type predicate does not depend on single steps in a proof-chain, nor do the single pieces of evidence depend on each other (for instance, booking flights to Italy does not depend on buying an Italian SIM-card). Single pieces of evidence are, however, summed in order to make progress in a proof-chain; having two pieces of evidence towards the same conclusion makes evidence stronger that having only one piece of evidence.

Now I will propose semantic representations for clause-embedding reveal-type predicates. Consider (400) and (401) for the perfective variant of 'prove.PFV that p', and (402) and (403) for its imperfective counterpart. (400) and (402) are final results of the derivation, (401) and (403) show single steps. (400) is to be interpreted as follows:

Lambda *e*, *e* is an event of proving that is realized in w_0 and there is a propositional argument *p* (a patient) of *e* in w_0.[59]

(400) **in w_0**:
$\lambda e[\text{udowodnić}(w_0)(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,p^{[60]})]$

with existential closure:
$\exists e[\text{udowodnić}(w_0)(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,p)]^{[61]}$

Single steps of a derivation do not differ from the previous analyses. The only refinement is the nature of the complement.

(401) **AspP**   (5)= $\lambda e[\text{udowodnić}(w_0)(e) \wedge \text{REAL}(w_0)(e) \wedge \text{PAT}(w_0)(e,p)]$
              (4)= $\lambda P \lambda e[P(w_0)(e) \wedge \text{REAL}(w_0)(e)](\lambda e[\text{udowodnić}(e) \wedge \text{PAT}(e,p)])$
  Asp$_{\text{PFV}}$ (3)= $\lambda P \lambda e[P(w_0)(e) \wedge \text{REAL}(w_0)(e)]$
  VP   (2)= $\lambda e[\text{udowodnić}(e) \wedge \text{PAT}(e,p)]$
  V   (1)= $\lambda P \lambda e[P(e)](\text{udowodnić})$

A complete realization of a proving event in the case of the perfective requires a complete realization of the patient argument, since a patient argument is an argument of a complete event. In the case of reveal-type predicates, this means the reveal of a truth-conditional object; there is a proof for the validity of an embedded proposition.

In contrast, only partial events of proving are realized in the case of the imperfective (only some pieces of evidence are available, but there is no proof). (402) is to be interpreted as follows: Lambda *e'*, lambda *e*, *e* is an event of proving that has a partial

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[59] According to my analysis, that-clauses denote propositions. However, clausal complements were lately shown to behave as modifiers (properties of individuals with a propositional content), cf. Moulton (2009) for English among others. Assuming that a CP is a modifier would make it possible to maintain the same type of a direct object argument for all kinds of incremental relations. Despite this technical advantage, in Polish, it seems more reasonable to keep the propositional status of CPs that are object complements of reveal-type predicates. First, testing for 'nouniness' of a CP is much more easy / transparent in English than in Polish. In English, only modifiers can bleed Condition C – stating that R-expressions must be free, cf. Chomsky (1993) – which is why CP-fronting can be used as a diagnostic for establishing the category of a clausal expression. In Polish, however, all CPs can be fronted, regardless of whether they are arguments or not. Second, in my proposal, a that-clause that receives a propositional status reveals a truth-conditional object, i.e. it carries a particular truth-value if embedded by the perfective matrix verb. Since I treat veridicality as a counterpart to total affectedness, the truth-value-based meaning of a that-sentence seems to be its most natural representation. Third, in line with Moulton (2009), I analyze a subject argument of 'prove' (the proof itself) as nouny: single pieces of evidence are individuals with propositional contents (evidence 1 such that…, evidence 2 such that etc.). The formal implementation of this idea will be the subject of future research.

[60] *p* stands for 'propositional complement'.

[61] If the complete event exists in a world of evaluation, this means that the truth-conditional object is completely revealed.

event *e'* that is realized in w_0 and there is a propositional patient argument *p* of *e* in w_0. Since a patient argument is an argument of an entire event, it cannot be completely revealed; only those parts of the patient that correspond to the realized parts of the proving event are realized too. This means that there is a 1:1-mapping between single subevents of proving and single pieces of evidence that are results of these subevents.

(402) **in w_0:**
$\lambda e'\lambda e[\text{udowadniać}(w_o)(e) \wedge e'\sqsubseteq e \wedge \text{REAL}(w_0)(e') \wedge \text{PAT}(W_0)(e,p)]$

with existential closure:
$\exists e'\exists e[\text{udowadniać}(w_o)(e) \wedge e'\sqsubseteq e \wedge \text{REAL}(w_0)(e') \wedge \text{PAT}(W_0)(e,p)]$

(403) is equivalent to the derivation of imperfective incremental theme verbs that take nominal complements. The only difference, again, is the nature of the patient argument.

(403) **AspP** $\underline{(5)= \lambda e'\lambda e[\text{udowadniać}(w_o)(e) \wedge e'\sqsubseteq e \wedge \text{REAL}(w_0)(e') \wedge \text{PAT}(W_0)(e,p)]}$
$(4)= \lambda P\lambda e'\lambda e[P(w_0)(e) \wedge e'\sqsubseteq e \wedge \text{REAL}(w_0)(e')](\lambda e[\text{udowadniać}(e) \wedge \text{PAT}(e,p)])$
Asp$_{\text{IPFV}}$ $(3)= \lambda P\lambda e'\lambda e[P(e) \wedge e'\sqsubseteq e \wedge \text{REAL}(w_0)(e')]$
VP $(2)= \lambda e[\text{udowadniać}(e) \wedge \text{PAT}(e,p)]$
V $(1)= \lambda P\lambda e[P(e)](\text{udowadniać})$

13 Conclusion

In this dissertation, I investigated a systematic interaction between the perfective aspect of clause-embedding predicates in Polish and a truth-related meaning of these predicates, i.e. their factive, veridical or implicature-based interpretations. I have shown that, regardless of the semantic class a matrix clause-embedding verb belongs to, a that-sentence tends to be interpreted as true if it is embedded by the perfective verb, but not if it is embedded by its imperfective counterpart. More precisely, all utterances *X guessed*.PFV / *proved*.PFV / *said*.PFV *that Y is a con man* systematically suggest that Y is a con man. The imperfective alternatives do not influence/determine the truth-value of an embedded proposition, i.e. from the semantic point of view, it is left open whether a that-sentence is true or not. My objects of investigation were (im)perfective minimal pairs, i.e. sentences that only differ in the aspectual marking on the main verb.

I investigated three groups of verbs: the presupposition, the entailment and the implicature group. The members of each group differ with respect to the stability of the truth-inference they trigger. The 'strongest' truth-inference can be observed within the presupposition group. Here, a that-sentence holds true not only in the affirmative environment, but also under negation (*X did not guess*.PFV / *sense*.PFV / *predict*.PFV *that Y is a con man* → Y is a con man) and in question constructions (*Did X guess*.PFV / *sense*.PFV / *predict*.PFV *that Y is a con man*? → Y is a con man). I analyzed the following lexemes: *zgadnąć*.PFV – *zgadywać*.IPFV 'guess', *przeczuć*.PFV – *przeczuwać*.IPFV 'sense', *wyczuć*.PFV – *wyczuwać*.IPFV 'sense', *rozgryźć*.PFV – *rozgryzać*.IPFV 'work out' and *przewidzieć*.PFV – *przewidywać*.IPFV 'predict'. According to the common terminology, I referred to the perfective variants as **factive**. Within the entailment group, a that-sentence holds true in the affirmative environment, but not under matrix verb negation or in question constructions. I investigated the following aspectual pairs: *udowodnić*.PFV – *udowadniać*.IPFV 'prove', *dowieść*.PFV – *dowodzić*.IPFV 'prove', *pokazać*.PFV – *pokazywać*.IPFV 'show', *wykazać*.PFV – *wykazywać*.IPFV 'reveal' and *potwierdzić*.PFV – *potwierdzać*.IPFV 'confirm'. Based on the above-described inference pattern, I called the perfective counterparts **veridical**. Due to the fact that 'confirm' behaved differently than other verbs from the entailment group, I did not treat its perfective variant as an entailment verb in the end. Because all other members of this group share their lexical-semantic features, I called them **reveal-type predicates**. The 'weakest' inference – truth-implicature – was attested for the communication verbs. Here, the inference is non-systematic and pragmatic in nature, which is why it did not build the core part of my thesis. I examined the following communication verbs: *obwieścić*.PFV – *obwieszczać*.IPFV 'announce', *poinformować*.PFV – *informować*.IPFV 'inform', *powiedzieć*.PFV – *mówić*.IPFV 'say', *zakomunikować*.PFV – *komunikować*.IPFV 'announce' and *zawiadomić*.PFV – *zawiadamiać*.IPFV 'notify'.

In order to verify the influence of aspect on the truth-oriented interpretation of clausal complements, I conducted an acceptability judgement study with 51 Polish native speakers. Participants were instructed to mark the acceptability of (im)perfective minimal pairs in (non-)factive scenarios. In factive scenarios, the state of affairs described by a particular aspectual pair matched a situation that was presented as a fact (information that was said to be taken for granted). In non-factive scenarios, the state of affairs described by the aspectual alternatives matched a situation that did not correspond to a 'fact', i.e. that did not hold. The perfective was expected to score higher in factive contexts and lower in non-factive ones. The opposite was supposed to hold for the imperfective. It further seemed reasonable that the strength of the truth-inference would determine the extent to which participants prefer the perfective and reject the imperfective in factive environments, and prefer the imperfective and reject the perfective in non-factive contexts.

The results have shown that there is a general tendency for the perfective aspect to trigger the truth-related meaning of a propositional complement. However, the most significant difference between (im)perfective forms in (non-)factive scenarios was found within the entailment group. Here, the perfective received the highest acceptance rates in the factive context and was clearly rejected in the non-factive scenario. In contrast, the imperfective received the highest acceptance rates in the non-factive environment and tended to be rejected in the factive setting. This means that it is not the strength of the inference itself (its resistance against negation or changing the sentence type) which determines the size of the effect; otherwise the most significant result would have arisen within the presupposition group.

I have shown that veridicality of perfective and neutrality of imperfective reveal-type predicates result from their event-structural properties, i.e. from the incremental character of the processes denoted by these predicates. Imperfective reveal-type predicates relate to ongoing events of proving, showing or revealing, i.e. they imply the existence of partial (non-maximal) evidence for an embedded proposition. Because the evidence is not sufficient in order to establish the truth-value of a that-sentence, an imperfective verb does not receive a veridical interpretation. In contrast, perfective reveal-type predicates imply the presence of maximal evidence for a clausal complement. The perfective semantically builds upon the imperfective by closing the incremental processes of proving, showing or revealing. This closure – the availability of maximal evidence – translates to the presence of a proof for a that-sentence. As soon as there is a proof, a that-sentence holds. As a result, a perfective clause-embedding reveal-type predicate receives its veridical meaning. In brief, incrementality of reveal-type predicates is based on the incremental creation of proof; there is a 1:1-mapping between subevents of proving and single pieces of evidence that were established during these subevents.

Following the above observations, I showed that there are similarities between incremental theme verbs that take nominal (like in 'build.(I)PFV <u>a house</u>') and incremental theme verbs that take clausal complements. I proposed to treat veridicality as a counterpart to total-affectedness of a nominal incremental theme that is an argument of a perfective incremental theme verb. More precisely, I compared a gradual creation of a proof to a gradual creation of an object. I further developed a unified analysis of different types of incremental relations, where incrementality is only defined on the level of events. The advantage of this analysis is that it does not require an object argument to be divided into parts, which was previously proposed for nominal incremental themes. Importantly, in the case of clause-embedding reveal-type predicates, an object argument – a that-clause – cannot be divided into parts the way a nominal object can be. This is because it is not a that-clause that has parts, but a proof for it. Restricting incrementality to the level of events makes it possible to include propositional arguments in the analysis.

My future research plans include the creation of a database of cross-linguistic information about (non-)veridicality of (im)perfective reveal-type predicates. Furthermore, I am interested in incorporating morphological formation patterns into my analysis. I am also planning acceptability judgement studies on the relationship between (im)perfectivity and exhaustivity in Polish. In general, it seems that the answers to wh-questions are less accessible for aspect than embedded propositions. It is further worth investigating whether perfective clause-embedding verbs that were not analyzed in my dissertation – for instance the so-called manner of speech verbs like *wyszeptać*.PFV 'whisper', *wykrzyczeć*.PFV 'shout', *wyśpiewać*.PFV 'sing', *wybełkotać*.PFV 'mumble' or *wymamrotać*.PFV 'mutter' – go along with any kind of truthfulness.

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Abbreviations

1	first person
2	second person
3	third person
a.c.	author's comment (my comment)
ACC	accusative
AG	agent
ATEL	atelic
CL	clitic (pronoun)
COMP	complementizer
DAT	dative
DEM	demonstrative
ERG	ergative
EXP	experiencer
FUT	future
GEN	genitive
INDEF	indefinite
INS	instrumental
IPFV	imperfective
M	masculine
MN	basic syntactic category of numerals
N	noun
NEG	negation
NP	noun phrase
PAR	partitive
PAT	patient
PFV	perfective
PL	plural (number)
PRS	present
PST	past
QVE	quantificational variability effect
REFL	reflexive
SG	singular (number)
STI	stimulus
SUK	gradual (successive) patient
TEL	telic
V	verb
VP	verbal phrase

Single test items

There are five groups of contexts, depending on the semantics of the matrix verb. Each name appears only once in the experiment. Contrasting verb forms were not extra highlighted in the questionnaire; alternatives (a) and (b) were marked in bold.

Context A

(Verb pair) 1.

<u>Factive scenario</u>

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Marek ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Marek who stole our company computer.
Księgowa Majewska i programista Adamczyk niezależnie od siebie wytypowali sprawców.
Tylko programista Adamczyk wskazał właściwą osobę –
Accountant Majewska and programmer Adamczyk independently of each other bet on who the thief was.
Only programmer Adamczyk picked out the right person –

(a) **zgadł***, że Marek jest winny. He guessed.*PFV *that Marek was guilty.*
idealnie *ideal* O O O O O O O bardzo źle *very bad*
(b) **zgadywał***, że Marek jest winny. He guessed.*IPFV *that Marek was guilty.*
idealnie O O O O O O O bardzo źle

<u>Non-factive scenario</u>

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Krzysztof ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Krzysztof who stole our company computer.
W czasie trwania śledztwa programista Król wytypował Izę, a księgowa Zabłocka wytypowała Krzysztofa.
Programista Król był wyraźnie rozczarowany –
During the investigation programmer Król picked out Iza, and accountant Zabłocka Krzysztof.
Programmer Król was clearly disappointed –

(a) **zgadywał***, że Iza jest winna. He guessed.*IPFV *that Iza was guilty.*
idealnie O O O O O O O bardzo źle
(b) **zgadł***, że Iza jest winna. He guessed.*PFV *that Iza was guilty.*
idealnie O O O O O O O bardzo źle

2.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Grzegorz ukradł nasz służbowy komputer.

Consider what follows a fact: Today it became clear that it was Grzegorz who stole our company computer.

Księgowa Witkowska i programista Pawlak niezależnie od siebie wytypowali sprawców.

Tylko programista Pawlak wskazał właściwą osobę –

Accountant Witkowska and programmer Pawlak independently of each other bet on who the thief was.

Only programmer Pawlak picked out the right person –

(a) ***przeczuł***, *że Grzegorz jest winny*. *He sensed.*PFV *that Grzegorz was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***przeczuwał***, *że Grzegorz jest winny*. *He sensed.*IPFV *that Grzegorz was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Dariusz ukradł nasz służbowy komputer.

Consider what follows a fact: Today it became clear that it was Dariusz who stole our company computer.

W czasie trwania śledztwa programista Nowakowski wytypował Halinę, a księgowa Szewczyk wytypowała Dariusza.

Programista Nowakowski był wyraźnie rozczarowany –

During the investigation programmer Nowakowski picked out Halina, and accountant Szewczyk Dariusz.

Programmer Nowakowski was clearly disappointed –

(a) ***przeczuwał***, *że Halina jest winna*. *He sensed.*IPFV *that Halina was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***przeczuł***, *że Halina jest winna*. *He sensed.*PFV *that Halina was guilty.*

idealnie O O O O O O O bardzo źle

3.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Ireneusz ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Ireneusz who stole our company computer.
Księgowa Baranowska i programista Michalak niezależnie od siebie wytypowali sprawców.
Tylko księgowa Baranowska wskazała właściwą osobę –
Accountant Baranowska and programmer Michalak independently of each other bet on who the thief was.
Only accountant Baranowska picked out the right person –

(a) ***wyczuła***, *że Ireneusz jest winny*. *She sensed.*PFV *that Ireneusz was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***wyczuwała***, *że Ireneusz jest winny*. *She sensed.*IPFV *that Ireneusz was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Janina ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Janina who stole our company computer.
W czasie trwania śledztwa programista Bąk wytypował Janinę, a księgowa Zawadzka wytypowała Zbigniewa.
Księgowa Zawadzka była wyraźnie rozczarowana –
During the investigation programmer Bąk picked out Janina, and accountant Zawadzka Zbigniew.
Accountant Zawadzka was clearly disappointed –

(a) ***wyczuwała***, *że Zbigniew jest winny*. *She sensed.*IPFV *that Zbigniew was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***wyczuła***, *że Zbigniew jest winny*. *She sensed.*PFV *that Zbigniew was guilty.*

idealnie O O O O O O O bardzo źle

4.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Feliks ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Feliks who stole our company computer.
Księgowa Chmielewska i programista Jasiński niezależnie od siebie wytypowali sprawców.
Tylko księgowa Chmielewska wskazała właściwą osobę –
Accountant Chmielewska and programmer Jasiński independently of each other bet on who the thief was.
Only accountant Chmielewska picked out the right person –

(a) ***rozgryzła**, że Feliks jest winny*. *She worked out/cracked.*PFV *that Feliks was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***rozgryzała**, że Feliks jest winny*. *She worked out/ cracked.*IPFV *that Feliks was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Malwina ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Malwina who stole our company computer.

W czasie trwania śledztwa programista Wilk wytypował Malwinę, a księgowa Baj wytypowała Marcela.
Księgowa Baj była wyraźnie rozczarowana –
During the investigation programmer Wilk picked out Malwina, and accountant Baj Marcel.
Accountant Baj was clearly disappointed –

(b) ***rozgryzała**, że Marcel jest winny*. *She worked out/cracked.*IPFV *that Marcel was guilty.*

idealnie O O O O O O O bardzo źle

(a) ***rozgryzła**, że Marcel jest winny*. *She worked out/cracked.*PFV *that Marcel was guilty.*

idealnie O O O O O O O bardzo źle

Context B

5.

Factive scenario

Potraktuj co następuje jako fakt: Wczoraj okazało się, że to Jerzy zabił panią
sprzątaczkę.
Consider what follows a fact: Yesterday it became clear that it was Jerzy who killed our cleaning lady.
Wcześniej dyrektor Pawłowski czuł, że Jerzy kogoś zabije, a grafik Wieczorek, że
Tomasz.
Tylko dyrektor Pawłowski wskazał właściwą osobę –
Earlier, director Pawłowski was sensing that Jerzy might kill someone, and graphic designer Wieczorek
was sensing that Tomasz might do so.
Only director Pawłowski picked out the right person –

(a) **przewidział**, *że Jerzy jest mordercą. He predicted.*PFV *that Jerzy is a murderer.*
idealnie O O O O O O O bardzo źle
(b) **przewidywał**, *że Jerzy jest mordercą. He predicted.*IPFV *that Jerzy is a murderer.*
idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Wczoraj okazało się, że to Bartosz zabił panią
sprzątaczkę.
Consider what follows a fact: Yesterday it became clear that it was Bartosz who killed our cleaning lady.
Wcześniej grafik Jaworski czuł, że Bartosz kogoś zabije, a dyrektor Dudek, że Jacek.
Dyrektor Dudek nie miał racji –
Earlier, graphic designer Jaworski was sensing that Bartosz might kill someone, and director Dudek was
sensing that Jacek might do so.
Director Dudek was wrong –

(a) **przewidywał**, *że Jacek jest mordercą. He predicted.*IPFV *that Jacek is a murderer.*
idealnie O O O O O O O bardzo źle
(b) **przewidział**, *że Jacek jest mordercą. He predicted.*PFV *that Jacek is a murderer.*
idealnie O O O O O O O bardzo źle

Context C (same for 6–9)

6.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Alicja ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Alicja who stole our company computer.
Komisarz Jankowski oraz komisarz Nowak niezależnie od siebie prowadzili śledztwo w tej sprawie.
Komisarz Nowak jako jedyny w sposób niepodważalny udokumentował winę Alicji –
Commissioner Jankowski and commissioner Nowak investigated the case independently of each other.
Only commissioner Nowak irrefutably documented that Alicja was to blame –

(a) ***udowodnił**, że to jej sprawka*. {*He} proved.*PFV *that she was guilty.*
idealnie O O O O O O O bardzo źle
(b) ***udowadniał**, że to jej sprawka*. {*He} proved.*IPFV *that she was guilty.*
idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Fryderyk ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Fryderyk who stole our company computer.
W czasie dochodzenia komisarz Malinowski wskazywał na Józefa, a komisarz Stępień na Fryderyka.
Komisarz Malinowski z trudem przyjął swoją porażkę –
During the investigation commissioner Malinowski suspected Józef, and commissioner Stępień – Fryderyk.
Commissioner Malinowski could hardly accept that he was wrong –

(a) ***udowadniał**, że Józef jest winny*. {*He} proved.*IPFV *that Józef was guilty.*
idealnie O O O O O O O bardzo źle
(a) ***udowodnił**, że Józef jest winny*. {*He} proved.*PFV *that Józef was guilty.*
idealnie O O O O O O O bardzo źle

7.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Aldona ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Aldona who stole our company computer.
Komisarz Krupa oraz komisarz Przybylski niezależnie od siebie prowadzili śledztwo w tej sprawie.
Komisarz Przybylski jako jedyny w sposób niepodważalny udokumentował winę Aldony –
Commissioner Krupa and commissioner Przybylski investigated the case independently of each other.
Only commissioner Przybylski irrefutably documented that Alicja was to blame –

(a) ***dowiódł**, że to jej sprawka*. {*He*} *proved*.PFV *that she was guilty.*
idealnie O O O O O O O bardzo źle
(b) ***dowodził**, że to jej sprawka*. {*He*} *proved*.IPFV *that she was guilty.*
idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Alojzy ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Alojzy who stole our company computer.
W czasie dochodzenia komisarz Kania wskazywał na Ernesta, a komisarz Chojnacki na Alojzego.
Komisarz Kania z trudem przyjął swoją porażkę –
During the investigation commissioner Kania suspected Ernest, and commissioner Chojnacki – Alojzy.
Commissioner Kania could hardly accept that he was wrong –

(a) ***dowodził**, że Ernest jest winny*. {*He*} *proved*.IPFV *that Ernest was guilty.*
idealnie O O O O O O O bardzo źle
(a) ***dowiódł**, że Ernest jest winny*. {*He*} *proved*.PFV *that Ernest was guilty.*
idealnie O O O O O O O bardzo źle

8.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Julita ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Julita who stole our company computer.
Komisarz Jarosz oraz komisarz Kowalik niezależnie od siebie prowadzili śledztwo w tej sprawie.
Komisarz Jarosz jako jedyny w sposób niepodważalny udokumentował winę Julity –
Commissioner Jarosz and commissioner Kowalik investigated the case independently of each other.
Only commissioner Jarosz irrefutably documented that Alicja was to blame –

(a) *wykazywał, że to jej sprawka*. {*He} revealed.*IPFV *that she was guilty.*
idealnie O O O O O O O bardzo źle
(b) *wykazał, że to jej sprawka*. {*He} revealed.*PFV *that she was guilty.*
idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Benedykt ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Benedykt who stole our company computer.
W czasie dochodzenia komisarz Zięba wskazywał na Benedykta, a komisarz Markowski na Nikodema.
Komisarz Markowski z trudem przyjął swoją porażkę –
During the investigation commissioner Zięba suspected Benedykt, and commissioner Markowski – Nikodem.
Commissioner Markowski could hardly accept that he was wrong –

(a) *wykazał, że Nikodem jest winny*. {*He} revealed.*PFV *that Nikodem was guilty.*
idealnie O O O O O O O bardzo źle
(b) *wykazywał, że Nikodem jest winny*. {*He} revealed.*IPFV *that Nikodem was guilty.*
idealnie O O O O O O O bardzo źle

9.

Factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Jagoda ukradła nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Jagoda who stole our company computer.
Komisarz Domański oraz komisarz Ciesielski niezależnie od siebie prowadzili śledztwo w tej sprawie.
Komisarz Domański jako jedyny w sposób niepodważalny udokumentował winę Jagody –
Commissioner Domański and commissioner Ciesielski investigated the case independently of each other.
Only commissioner Domański irrefutably documented that Alicja was to blame –

(a) *pokazywał, że to jej sprawka*. {*He} showed*.IPFV *that she was guilty.*

idealnie O O O O O O O bardzo źle

(b) *pokazał, że to jej sprawka*. {*He} showed*.PFV *that she was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: Dziś stało się jasne, że to Fabian ukradł nasz służbowy komputer.
Consider what follows a fact: Today it became clear that it was Fabian who stole our company computer.
W czasie dochodzenia komisarz Tomczak wskazywał na Fabiana, a komisarz Stasiak na Rudolfa.
Komisarz Stasiak z trudem przyjął swoją porażkę –
During the investigation commissioner Tomczak suspected Fabian, and commissioner Stasiak – Rudolf.
Commissioner Stasiak could hardly accept that he was wrong –

(a) *pokazał, że Rudolf jest winny*. {*He} showed*.PFV *that Rudolf was guilty.*

idealnie O O O O O O O bardzo źle

(b) *pokazywał, że Rudolf jest winny*. {*He} showed*.IPFV *that Rudolf was guilty.*

idealnie O O O O O O O bardzo źle

Context D

10.

<u>Factive scenario</u>

Potraktuj co następuje jako fakt: Wczoraj stało się jasne, że Olga rzeczywiście jest mężatką.
Consider what follows a fact: Yesterday it became clear that Olga is actually married.
Detektyw Kaczmarek i detektyw Grabowski od jakiegoś czasu sugerowali, że dziewczyna mówi prawdę.
Wieczorem detektyw Kaczmarek rozwiał wszelkie wątpliwości –
Detective Kaczmarek and detective Grabowski have been suggesting for some time that the woman was telling the truth.
In the evening, detective Kaczmarek resolved all the doubts.

(a) ***potwierdzał**, że Olga ma męża*. {*He*} *confirmed.*IPFV *that Olga has a husband.*
idealnie O O O O O O O bardzo źle
(b) ***potwierdził**, że Olga ma męża*. {*He*} *confirmed.*PFV *that Olga has a husband.*
idealnie O O O O O O O bardzo źle

<u>Non-factive scenario</u>

Potraktuj co następuje jako fakt: Wczoraj stało się jasne, że Borys rzeczywiście jest kawalerem.
Consider what follows a fact: Yesterday it became clear that Borys is actually a bachelor.
Detektyw Szulc sugerował, że chłopak mówi prawdę, a detektyw Borowski, że kłamie.
Detektyw Borowski, nie mając na to żadnych dowodów,
Detective Szulc was suggesting that the man was telling the truth, whereas detective Borowski that the man was lying.
Detective Borowski, without having any proof,

(a) ***potwierdził**, że Borys ma żonę*. *confirmed.*PFV *that Borys has a wife.*
idealnie O O O O O O O bardzo źle
(b) ***potwierdzał**, że Borys ma żonę*. *confirmed.*IPFV *that Borys has a wife.*
idealnie O O O O O O O bardzo źle

Implicature verbs (11–15)

Context E (same for 11–15)

11.

Factive scenario

Potraktuj co następuje jako fakt: To pewne, że to Patryk ukradł pieniądze z kasy.
Consider what follows a fact: It is certain that it was Patryk who stole the money from the register.
Dyrektor Sikorski i księgowa Dziedzic opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie księgowa Dziedzic przekazuje dalej dokładnie sprawdzone informacje.
To ona
Director Sikorski and accountant Dziedzic each said different things about who the potential culprit was, but only accountant Dziedzic is passing on the exactly proved information.
She

(a) **obwieszczała** *nam, że Patryk jest winny*. *accounced.*IPFV *that Patryk was guilty.*

idealnie O O O O O O O bardzo źle

(b) **obwieściła** *nam, że Patryk jest winny*. *accounced.*PFV *that Patryk was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: To pewne, że to nie Sandra ukradła pieniądze z kasy.
Consider what follows a fact: It is certain that it was not Sandra who stole the money from the register.

(a) *Grafik Pawlik niby* **obwieścił** *nam, że Sandra jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
*Graphic designer Pawlik kind of announced.*PFV *that Sandra was guilty, but we all know that he is usually making things up.*

idealnie O O O O O O O bardzo źle

(b) *Grafik Pawlik niby* **obwieszczał** *nam, że Sandra jest winna*, *wszyscy jednak wiemy, że ma on tendencję do zmyślania*.
*Graphic designer Pawlik kind of announced.*IPFV *that Sandra was guilty, but we all know that he is usually making things up.*

idealnie O O O O O O O bardzo źle

12.

Factive scenario

Potraktuj co następuje jako fakt: To pewne, że to Jędrzej ukradł pieniądze z kasy.
Consider what follows a fact: It is certain that it was Jędrzej who stole the money from the register.

Dyrektor Wawrzyniak i księgowa Kruk opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie księgowa Kruk przekazuje dalej dokładnie sprawdzone informacje.
To ona

Director Wawrzyniak and accountant Kruk each said different explanations about who the potential culprit was, but only accountant Kruk is passing on the exactly proved information.
She

(a) ***informowała*** *nas, że Jędrzej jest winny.* informed.IPFV *us that Jędrzej was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***poinformowała*** *nas, że Jędrzej jest winny.* informed.PFV *us that Jędrzej was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: To pewne, że to nie Laura ukradła pieniądze z kasy.
Consider what follows a fact: It is certain that it was not Laura who stole the money from the register.

(a) *Grafik Urbaniak niby* ***poinformował*** *nas, że Laura jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Urbaniak kind of informed.PFV us that Laura was guilty, but we all know that he is usually making things up.

idealnie O O O O O O O bardzo źle

(b) *Grafik Urbaniak niby* ***informował*** *nas, że Laura jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Urbaniak kind of informed.IPFV us that Laura was guilty, but we all know that he is usually making things up.

idealnie O O O O O O O bardzo źle

13.

Factive scenario

Potraktuj co następuje jako fakt: To pewne, że to Teodor ukradł pieniądze z kasy.
Consider what follows a fact: It is certain that it was Teodor who stole the money from the register.
Dyrektor Karpiński i księgowa Gajda opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie dyrektor Karpiński przekazuje dalej dokładnie sprawdzone informacje.
To on
Director Karpiński and accountant Gajda each said different things about who the potential culprit was, but only director Karpiński is passing on the exactly proved information.
He

(a) ***mówił*** *nam, że Teodor jest winny*. told.IPFV *us that Teodor was guilty.*

idealnie O O O O O O O bardzo źle

(b) ***powiedział*** *nam, że Teodor jest winny*. told.PFV *us that Teodor was guilty.*

idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: To pewne, że to nie Brygida ukradła pieniądze z kasy.
Consider what follows a fact: It is certain that it was not Brygida who stole the money from the register.

(a) *Grafik Klimek niby* ***powiedział*** *nam, że Brygida jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Klimek kind of told.PFV us that Brygida was guilty, but we all know that he is usually making things up.

idealnie O O O O O O O bardzo źle

(b) *Grafik Klimek niby* ***mówił*** *nam, że Brygida jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Klimek kind of told.IPFV us that Brygida was guilty, but we all know that he is usually making things up.

idealnie O O O O O O O bardzo źle

14.

<u>**Factive scenario**</u>

Potraktuj co następuje jako fakt: To pewne, że to Kajetan ukradł pieniądze z kasy.
Consider what follows a fact: It is certain that it was Kajetan who stole the money from the register.
Dyrektor Madej i księgowa Romanowska opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie dyrektor Madej przekazuje dalej dokładnie sprawdzone informacje.
To on
Director Madej and accountant Romanowska each said different things about who the potential culprit was, but only director Madej is passing on the exactly proved information.
He

(a) **komunikował** *nam, że Kajetan jest winny*. announced.IPFV *that Kajetan was guilty.*
idealnie O O O O O O O bardzo źle
(a) **zakomunikował** *nam, że Kajetan jest winny*. announced.PFV *that Kajetan was guilty.*
idealnie O O O O O O O bardzo źle

<u>**Non-factive scenario**</u>

Potraktuj co następuje jako fakt: To pewne, że to nie Arleta ukradła pieniądze z kasy.
Consider what follows a fact: It is certain that it was not Arleta who stole the money from the register.

(a) *Grafik Świątek niby* **zakomunikował** *nam, że Arleta jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Świątek kind of announced.PFV that Arleta was guilty, but we all know that he is usually making things up.
idealnie O O O O O O O bardzo źle
(b) *Grafik Świątek niby* **komunikował** *nam, że Arleta jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
Graphic designer Świątek kind of announced.IPFV that Arleta was guilty, but we all know that he is usually making things up.
idealnie O O O O O O O bardzo źle

15.

Factive scenario

Potraktuj co następuje jako fakt: To pewne, że to Sergiusz ukradł pieniądze z kasy.
Consider what follows a fact: It is certain that it was Sergiusz who stole the money from the register.
Dyrektor Kosiński i księgowa Rogowska opowiadali każde co innego w sprawie potencjalnego sprawcy, ale jedynie księgowa Rogowska przekazuje dalej dokładnie sprawdzone informacje.
To ona
Director Kosiński and accountant Rogowska each said different things about who the potential culprit was, but only accountant Rogowska is passing on the exactly proved information.
She

(a) ***zawiadamiała*** *nas, że Sergiusz jest winny. notified.*IPFV *us that Sergiusz was guilty.*
idealnie O O O O O O O bardzo źle
(b) ***zawiadomiła*** *nas, że Sergiusz jest winny. notified.*PFV *us that Sergiusz was guilty.*
idealnie O O O O O O O bardzo źle

Non-factive scenario

Potraktuj co następuje jako fakt: To pewne, że to nie Judyta ukradła pieniądze z kasy.
Consider what follows a fact: It is certain that it was not Judyta who stole the money from the register.

(a) *Grafik Rybak niby* ***zawiadomił*** *nas, że Judyta jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
*Graphic designer Rybak kind of notified.*PFV *us that Judyta was guilty, but we all know that he is usually making things up.*
idealnie O O O O O O O bardzo źle
(b) *Grafik Rybak niby* ***zawiadamiał*** *nas, że Judyta jest winna, wszyscy jednak wiemy, że ma on tendencję do zmyślania.*
*Graphic designer Rybak kind of notified.*IPFV *us that Judyta was guilty, but we all know that he is usually making things up.*
idealnie O O O O O O O bardzo źle

Name: Zuchewicz, Vorname: Karolina

Selbständigkeitserklärung zur Dissertation

Ich erkläre ausdrücklich, dass es sich bei der von mir eingereichten Dissertation mit dem Titel

On the veridicality of perfective clause-embedding verbs in Polish:
A unified aspect-based analysis of incremental theme verbs with nominal and propositional complements

um eine von mir erstmalig, selbstständig und ohne fremde Hilfe verfasste Arbeit handelt.

Ich erkläre ausdrücklich, dass ich *sämtliche* in der oben genannten Arbeit verwendeten fremden Quellen, auch aus dem Internet (einschließlich Tabellen, Grafiken u. Ä.) als solche kenntlich gemacht habe. Insbesondere bestätige ich, dass ich ausnahmslos sowohl bei wörtlich übernommenen Aussagen bzw. unverändert übernommenen Tabellen, Grafiken u. Ä. (Zitaten) als auch bei in eigenen Worten wiedergegebenen Aussagen bzw. von mir abgewandelten Tabellen, Grafiken u. Ä. anderer Autorinnen und Autoren (Paraphrasen) die Quelle angegeben habe.

Mir ist bewusst, dass Verstöße gegen die Grundsätze der Selbständigkeit als Täuschung betrachtet und nach § 16 der Promotionsordnung der Philosophischen Fakultät II (jetzt: Sprach- und literaturwissenschaftliche Fakultät) vom 27. April 2016 (Amtliches Mitteilungsblatt der Humboldt-Universität zu Berlin Nr. 26/2016) entsprechend geahndet werden.

Datum: 30.10.2019

Karolina Zuchewicz