

HOW FACTIVE ARE *SEE*, *HEAR*, *FEEL* AND THEIR POLISH EQUIVALENTS?

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The aim of the paper is to test the degree of factivity of the three selected verbs and their Polish equivalents.¹ Thus, the analysis proper will refer to and attempt to develop some of the observations provided by certain linguists and briefly mentioned in the next section. The subsequent parts of this paper will deal with the verbs in question in their 'perceptive' and 'cognitive' uses (the latter term has been coined here due to the lack of any better word which could, to my knowledge, cover the meanings of *see*, *hear*, *feel* denoting 'understanding', 'having got the information', and 'belief' or 'conviction', respectively). The relevant English assertions and their Polish equivalents will be exposed to semantic and syntactic factivity criteria, which will hopefully give some insight into the problem of incorporating the verbs under discussion into the factivity framework. The present sketchy treatment of the issue does not offer any explicit theory; it is simply a set of remarks which may be a stimulus for a further much deeper study.

1. THE PROBLEM

The question of the truth value of propositions is of vital importance for linguists, and semanticists in particular. Much has already been written on this subject, but it was the work of Kiparsky and Kiparsky (1971) which

¹ The three verbs have been chosen out of the five because of their peculiar two-fold syntactic and semantic characteristics. Besides their perception meaning, requiring either a participial or infinitival clause to complement them, *see*, *hear*, *feel* can also denote 'understanding', 'having got the information' and 'belief' or 'conviction', respectively. In this sense they usually take typical factive complements of the structure *that S*, which are rarely found with *smell* and *taste*.

shed some new light upon the classification of verbs and their complements. According to the semantic and syntactic criteria postulated by the authors, they could be labelled either factive or non-factive. These criteria seem worth mentioning here since the subsequent studies of factivity are to a large extent based on the Kiparskys' observations. We shall not, however, discuss the noun *fact*, which was claimed to be present in the underlying structure of those verbs, a solution later criticized and abandoned by, for instance, Karttunen (1971b : 23).² Moreover, the conditions under which a verb may be termed factive will be of great help to our analysis as they will clarify the semantic/syntactic relations holding between the relevant verbs and their complements (cf. Kiparsky and Kiparsky 1971 : 346—8).

1.1. A logical (semantic) criterion

The speaker presupposes that the embedded clause expresses a true proposition and makes an assertion about the proposition. All predicates behaving syntactically as factive have this semantic property and almost none of these which behave syntactically as non-factives do. Thus, factivity depends on presuppositions, not assertions, and presuppositions asserted to be true must be distinguished from those presupposed to be true.³

1.2. Syntactic criteria

a) For factives extraposition is optional and for non-factives it is obligatory:

1. That there are porcupines in our basement makes sense to me
2. It makes sense to me that there are porcupines in our basement
- 3.*That there are porcupines in our basement seems to me
4. It seems to me that there are porcupines in our basement

b) Only non-factives allow turning the initial NP of the subordinate clause into the subject of the main clause and converting the remainder of the subordinate clause into an infinitival phrase:

5. He is likely to accomplish even more
- 6.*He is relevant to accomplish even more.
7. There seems to have been a snowstorm.
- 8.*There is tragic to have been a snowstorm.

c) Only factive verbs allow the full range of gerundial constructions and adjectival nominalizations in *-ness* to stand in place of the *that*-clause:

9. His being found guilty is tragic.
10. The whiteness of the whale makes sense to me.

² This criticized syntactic criterion will be abandoned in our analysis, too, since its contribution to the present subject is rather dubious. Cf. the oddity of the assertions with *see*:

- ?I saw the fact that John drank a lot.
?I saw the fact of John's drinking a lot.

³ On the role of presupposition with factive predicates, cf. Morgan (1969 : 167) and Leech (1974 : 306—7).

11.*His being found guilty is sure.

12.*The whiteness of the whale turns out.

As has already been mentioned, the discussion of factive verbs was followed by other authors. For instance Karttunen (1970; 1971a; 1971b) provided a more thorough analysis of predicates taking sentential complements, thus winding up with a much more detailed classification encompassing besides factive verbs proper also implicative, negative implicative, if— and only if-verbs.⁴ The criteria justifying this subdivision consisted of checking the truth value of the verb complement under various transformational operations a given proposition was exposed to, e.g., question, negation, modality, counterfactual conditional, etc. On the basis of those measures Karttunen (1970 : 335) noticed that *see*, *hear*, *feel*, while denoting perception, commit the speaker to the truth of their complement S only in affirmative statements, whereas in negations they are non-committal in this respect. Consequently, they are associated with one part of presupposition and they merely express the sufficient condition for S to be true:

13. $\forall(S) \supset S$, where v = verb

S = sentential complement

' $\forall(S)$ is a sufficient condition for S'

Since the negation test fails with these verbs, hence the other, i.e., the necessary condition for S: $\sim \forall(S) \supset \sim(S)$ is not fulfilled. To recapitulate, Karttunen is of the opinion that the verbs in question do not meet the requirements qualifying them as full factives, i.e., they do not presuppose the truth of their complements, thus the implication holds only in one direction. Being one-way implicative they are labelled if-verbs.

This type of relation is also termed entailment and was defined by Leech (1974 : 306—7), who followed Karttunen's (1971a) division of predicates into pure factives, implicatives and non-factives. Consequently, *see*, *hear*, *feel* belong according to Leech to the second group and thus differ considerably from pure factives as to the relation holding between them and their complements. As has already been noted, the latter presuppose the truth of their complements, whereas the former only entail it.

The impact of presuppositions on the illocutionary force of a proposition was also dealt with by Jackendoff (1972), who distinguished two types of presuppositions: focal (derived by focus assignment) and inherent (introduced by factive verbs). He claimed that the latter satisfies the widely accepted definition of "information assumed by the speaker to be shared by him and the hearer." (Jackendoff 1972 : 276).⁵

The relevant problems were also analyzed by Givón (1972). In his article

⁴ For a more detailed discussion of the relevant problems, cf. Karttunen (1970).

⁵ The formalization of inherent presuppositions and their status in the underlying structures of factives is dealt with in Jackendoff (1972 : 276—8).

he distinguished two groups of verbs: Aspectual/Modal ordinarily taking infinitival and gerundive complements and Perception/Knowledge verbs followed by *that S* complements. This classification roughly corresponds to Karttunen's (1970) distinction between implicatives and factives, respectively. It is based on the already mentioned entailment vs. presupposition relation holding between verbs and their complements. Having exposed the three perception predicates to a series of syntactic tests, Givón lists *see* and *hear* under the heading Perception/Knowledge, i.e., factive verbs, whereas *feel* is grouped as a definitely non-factive (Givón 1972 : 43–6).⁶

Much more has been said on the subject of factivity and the impact the logical relations of presupposition and entailment have upon the truth value of the verbal complement. These studies include Karttunen's whole series of articles (1970; 1971a; 1971b), Hurford (1973), and Choon-Kyu Oh (1974), to mention just a few. They will not, however, be discussed here as they deal with some other aspects of the notion of factivity which do not concern us directly here.

Thus, the present paper will be confined to the investigation of factivity as exhibited by *see*, *hear*, *feel* in their perceptive and cognitive uses and their respective Polish equivalents. Also, the observations and conclusions arrived at by some linguists will serve as a point of reference in this tentative analysis which, for the clarity of presentation, will be divided into two sections. The first one will be devoted to the perception verbs proper, their most common types of complements, i.e., the participial clause and the infinitival construction, analyzed simultaneously as to their power of affecting the factivity of the main verb. It must be noted here that the selection of the two structures is semantically determined. Hence, to denote duration progressive aspect is needed and the former complement is employed; on the other hand, the latter expresses completion of the action, thus represents perfective aspect.⁷ Moreover, as was mentioned above, participial and infinitival clauses are usually considered the most typical complements of perception verbs. However, other structures are also used, though less frequently. One type involves the passivization of complement S, hence the passivization of 14. and 15. renders 14a. and 15a., respectively (14b is very rarely accepted):

- 14. He saw them beat his team.
- 14a. He saw his team beaten.
- 14b. He saw his team be beaten.
- 15. He saw them beating his team.

⁶ A more detailed justification of factivity label with *see*, *hear* vs. non-factive *feel* can be found in Givón (1972 : 43–7).

⁷ The aspectual/semantic difference between the two types of complements is given a more detailed account in Lewandowska (1976 : 222).

15b. He saw his team being beaten.⁸

The *that S* complement can also be encountered with *see*, *hear*, *feel* in their perceptive sense, cf.

16. I saw that the glass was dirty.

However, it is much more characteristic of the cognitive use of these verbs, cf. below. Since the discussion of all minor types of complements is beyond the scope of this paper, we will assume the criterion of frequency of occurrence to be sufficient for limiting the analysis to the most typical structures, i.e., infinitival and participial clauses (Section 2.1).

The second part of the paper will deal with the three verbs in their 'cognitive' sense (cf. ft. 1). Again, only the most typical complementation will be taken into account, i.e., the *that S* construction, the other structures being disregarded at the moment for the reasons stated above.⁹ Each section will contain a set of English sentences and their Polish equivalents which will be tested for their factivity on the basis of the above-enumerated criteria. In the first place, the logical relations holding between the verb and its complement will be examined and then various syntactic tests will be applied to show how the 3 English verbs and their Polish counterparts can be incorporated into the factivity framework and how they fit there. Secondly, the juxtaposition of the two bodies of data will reveal the relations between the corresponding structures of the two systems as well as the syntactic contrasts in the surface realizations of equivalent propositions. Finally, the present observations may raise some questions for further discussion concerning the problems to be sketched briefly here.

2. THE ANALYSIS

1.2. *See*, *hear*, *feel* as perception verbs.

2.1.1. Let us take into account the logico-semantic criteria of factivity first. Consider the following examples:

- 17. I saw John drinking milk
- 17a. ? Widziałam Jana pijącego mleko
- 17b. Widziałam jak Jan pił mleko.
- 18. Did you see John drinking milk?
- 18a. Czy widziałas jak Jan pił mleko?
- 19. I did not see John drinking milk

⁸ For the discussion of these examples, cf. Palmer (1965 : 168).

⁹ The following marginal cases will be excluded from our analysis: *see to* and *see that*, being neither cognitive nor perceptive; *hear say* and *hear tell* carrying special meanings, *feel* in structures, like:

He felt the plan to be crazy, etc.

- 19a. Nie widziałam jak Jan pił mleko
 20. John was drinking milk
 20a. Jan pił mleko
 17' I saw John drink milk
 17a' Widziałam, że Jan (wy)pił mleko
 18' Did you see John drink milk?
 18a' Czy widziałaś, że Jan (wy)pił mleko?
 19' I did not see John drink milk
 19a' Nie widziałam, $\left\{ \begin{array}{l} \text{że} \\ \text{żeby} \end{array} \right\}$ Jan (wy)pił mleko
 20' John has drunk his milk
 20a' Jan (wy)pił mleko¹⁰
 21. I heard her scolding the baby
 21a. ? Słyszałam ją karcącą dziecko
 21b. Słyszałam, jak karcila dziecko
 22. Did you hear her scolding the baby?
 22a. Czy słyszałaś, jak karcila dziecko?
 23. I did not hear her scolding the baby
 23a. Nie słyszałam, jak karcila dziecko
 24. She was scolding the baby
 24a. Ona karcila dziecko
 21' I heard her scold the baby
 21a' Słyszałam, że ona (s)karcila dziecko
 22' Did you hear her scold the baby?
 22a' Czy słyszałaś, że ona (s)karcila dziecko?
 23' I did not hear her scold the baby
 23a' Nie słyszałam, $\left\{ \begin{array}{l} \text{że} \\ \text{żeby} \end{array} \right\}$ ona (s)karcila dziecko
 24. She has scolded the baby
 24a' Ona (s)karcila dziecko
 25. I felt tears fillig my eyes
 25a. Czulałam łzy wypełniające mi oczy
 25b. Czulałam, jak łzy wypełniały mi oczy¹¹

¹⁰ The problem of aspect in Polish is still a complicated issue in this type of sentences. The author feels completion is better expressed in Polish by perfective aspect, however, two forms are given in this paper since some native speakers of Polish claim that the non-perfective form is equally possible. Note also two conjunctions accompanying the negative sentences. Although both may be used here, *żeby* seems to be preferred to *że*, particularly, if the content of proposition is questionable.

¹¹ *Czuć* has two possible complements equivalent to English *feel* with participial complement, i.e., both the present participle and the subordinate sentence with *jak* conjunction are used as perfectly grammatical. Note the restriction in the case of *widzieć* and *słyszeć* which allow only the latter complement.

26. Did you feel tears filling your eyes?
 26a. Czy czulaś, jak łzy wypełniały ci oczy?
 27. I did not feel tears filling my eyes
 27a. Nie czulałam, jak łzy wypełniały mi oczy
 28. Tears were filling my eyes
 28a. Łzy wypełniały mi oczy
 25' I felt tears fill my eyes
 25a' Czulałam, że łzy wypełni(a)ły mi oczy
 26' Did you feel tears fill your eyes?
 26a' Czy czulaś, że łzy wypełni(a)ły ci oczy?
 27' I did not feel tears fill my eyes
 27a' Nie czulałam, że łzy wypełni(a)ły mi oczy
 28' Tears filled my eyes
 28a' Łzy wypełni(a)ły mi oczy

Affirmative assertions with the three verbs in the main clause commit the speaker to the belief that the proposition expressed by the complement is also true. If we report a process of perceiving an event with one of our senses, i.e., we state that we *see*, *hear* or *feel* something happening, the impression corresponds to real facts, unless we lie or our perceptors work improperly. It must be noted that the syntactic differences together with aspectual and semantic contrasts between the two English sentences with perception verbs will be ignored at present since they do not affect the factive — non-factive relation holding between the verbs and their complements, cf. the meaning postulates 29. and 30. Besides, the relevant syntactic issues will be discussed in a separate section below. Consequently, uttering 17, 21, 25 and their syntactic—semantic variants 17', 21', 25', respectively, we take for granted the truth of their corresponding presuppositions, i.e., 20, 24, 28 as well as 20', 24', 28', so that sufficient condition for the complement S is fulfilled:

29. $v(S) \supset S$, where $v \rightarrow \text{see, hear, feel}$

$$S \rightarrow X \left\{ \begin{array}{l} \text{Part. Cl.} \\ \text{Inf. Constr.} \end{array} \right\} Y$$

Thus, whenever *see*, *hear*, *feel* are complemented by a sentence S realized as either a participial clause or an infinitival clause, (cover symbols X, Y stand here for any element preceding or following these structures), then the sufficient condition for the truth of the complement is fulfilled.

However, it is no longer true with questions and negations, cf. 18, 19, 22, 23, 26, 27 and 18', 19', 22', 23', 26', 27'. Apparently, when the assertions with *see*, *hear*, *feel* in their perceptive sense are questioned or negated they are non-committal with respect to the truth value of their presuppositions. Also, our intuitive judgements confirm this observation since, if we have no information about the perception of an event, or if we state that what happened was not seen, heard or felt, then this event cannot be evaluated.

as either true or false. Thus, the necessary condition for the truth of the complement is not satisfied:

30. $\sim v(S) \not\sim S$, where $v \rightarrow \text{see, hear, feel}$

$$S \rightarrow X \left\{ \begin{array}{l} \text{Part. Cl.} \\ \text{Inf. Cl.} \end{array} \right\} Y$$

The present semantic analysis leads to the conclusion that the relation between the verbs discussed and their complements is that of entailment since the conditions for presupposition are not met by them. Therefore, they are not full factives but only implicatives (or conditional factives — cf. Leech 1974: 304).

Turning to the Polish corpus, one may notice the striking relevance of the above remarks concerning the English sentences to their Polish equivalents. Similarly, the affirmative propositions 17b, 21b, 25a, b as well as their structural variants 17a', 21a', 25a', imply the truth of their complements. Note that 17a, 21a imply the direct translation of the English participial clause which sounds odd in Polish, hence a subordinate sentence with *jak* conjunction is used instead, but only in the case of *widzieć* and *słyszeć*, since *czuć* takes both complements, cf. the section devoted to syntax. However, the same structures when questioned or negated do not commit one either to the truth or to the falsity of the presupposed complements, cf. 18a, 19a, 22a, 23a, 26a, 27a and the corresponding sentences 18a', 19a', 22a', 23a', 26a', 27a'. Thus, as in the case of their English equivalents, *widzieć*, *słyszeć*, *czuć* only entail the content of their complement clauses and are grouped under the same label, i.e. that of implicative verbs.

To conclude, the consistency of English and Polish as to the implicative nature of perception predicates is a challenge for linguists. Some more detailed cross-linguistic studies may reveal an unexpected universality in this correlation.

2.1.2. Syntactic criteria.

Before the analysis proper, some general remarks on the syntax of sentences with the three English perception verbs and their Polish equivalents may be worth presenting here:

a) English perception verbs involve two basic types of complements, i.e., infinitival and participial constructions. The choice between the two is determined by some semantic-temporal relations between the verb and its complement, such as duration and completion of the action, respectively.

b) in Polish the completion of the action is expressed by means of a finite clause complement or a nominal derived from a perfective verb. The present corpus, however, is limited to the first case, since nominalization, when applied to the examples discussed, will result in such odd structures, as:

31. *Widziałam Jana wypicie mleka

32. *Słyszałam jej skarcenie dziecka

33. *Czułam wypełnianie moich oczu łzami

Moreover, the final clause complement is conjoined with the main clause by the conjunction *że* which in negative sentences is in the relation of free variation with *żeby* (cf. ft. 10). Finally, denoting completion and being a finite structure, the complement in Polish is normally in the past tense. However, according to some native speakers of Polish, English infinitival construction may sometimes be translated into Polish as a present, non-perfective verbal form, cf.:

17a'. Widziałam, że Jan $\left\{ \begin{array}{l} \text{wypił} \\ \text{pił} \end{array} \right\}$ mleko

Nevertheless, the author believes the first interpretation to be more plausible.

c) the sentences with participles render hardly acceptable structures in Polish if the corresponding active participial construction is employed in case of *widzieć* and *słyszeć*. Instead, a subordinate S with *jak* conjunction is used. *Czuć* allows, however, both complements (cf. 25a, b. and ft. 11).¹²

2.1.2.1. Extraposition transformation

If we look at examples 17, 17', 21, 21', 25, 25', it becomes apparent that their structural descriptions do not allow the application of extraposition. It is the participial and infinitival complements which, in contradistinction to *that*-clauses, block this transformation. Besides, the noun in the main clause is in the subject, not object position. Thus, the syntactic criterion of factivity is irrelevant with the English verbs of perception.

On the other hand, the presence of *że* in front of the infinitival complement clause in Polish sentences may fulfill the conditions for the application of extraposition. However, they again do not meet the criterion that the main clause NP is in the object and not in the subject case as it is in 17a', 21a', 25a'. Consequently, the extraposition transformation is not applicable to the Polish corpus either, and the present criterion must be omitted in our analysis.

2.1.2.2. Subordinate clause NP fronting

If we perform the operation of fronting the initial NP of the complement clause in 17, 21, 25 and 17', 21', 25', it will automatically trigger (as was mentioned above), the conversion of the rest of the sentence into an infinitival clause. These transformations will, however, result in utterly ungrammatical structures:

34. *John to have drunk milk I saw

35. *Jan wypić mleko widziałam

¹² The problem of contrasting English and Polish types of verb complementation is discussed in Lewandowska (1976).

Hence, what is additionally required here is the passive rule which when also applied to the relevant examples will render the following sentences (note the inapplicability of the two rules to the Polish corpus):

36. *John was seen (by me) to be drinking milk
 36a. *Jan był widziany (przeze mnie) pić mleko
 36b. Widziano Jana jak pił mleko
 37. *John was seen (by me) to have drunk milk
 37a. *Jan był widziany (przeze mnie) wypić mleko
 37b. Widziano Jana, że wypił mleko
 38. ?She was heard (by me) to be scolding the baby
 38a. *Była słyszana (przeze mnie) karcieć dziecko
 38b. Słyszano ją jak karcila dziecko
 39. ?She was heard (by me) to have scolded the baby
 39a. *Była słyszana (przeze mnie) skarcieć dziecko
 39b. Słyszano ją, że skarcila dziecko
 40. ?Tears were felt (by me) to be filling my eyes
 40a. *Łzy były wyczuwane (przeze mnie) wypełniać mi oczy
 40b. Czulałam łzy jak wypełniały mi oczy
 41. ?Tears were felt (by me) to have filled my eyes
 41a. *Łzy były wyczuwane (przeze mnie) wypełnić mi oczy
 41b. Czulałam, że łzy wypełniły mi oczy

The above-presented analysis has revealed a varying degree of acceptability with respect to the structure in question. Thus, asterisks denote total ungrammaticality, cf. the examples with *see*, whereas all the questioned sentences are judged by native speakers as possible but very artificial in a normal discourse. Moreover, they feel 36 and 38 could be used in legal jargon, if the bracketed phrase *to be* were omitted which would not then fit our pattern.

To summarize, all three English perception verbs have passed this negative factivity test which encourages us to proceed with the analysis. If we consider the relevant Polish examples, it is obvious that the three transformations do not work on this body of data, either. If the complement NP is fronted and infinitival phrase constructed out of the rest of the sentence and then the passive rule is applied — ungrammatical sentences result. The only possibility is an impersonal construction with the fronted NP preceded by the impersonal verbal form (hence, contrary to our assumptions). Consequently, this criterion is not fulfilled in Polish, either and the verbs under discussion share one of the syntactic characteristics of factive verbs, i.e., they do not allow turning the initial NP of the subordinate clause into the subject of the main clause and converting the remainder of the subordinate clause into an infinitival phrase.

2.1.2.3. Gerundial constructions

Consider the following examples:

42. *John's having been drinking milk was seen (by me)
 42a. *Jana picie mleka było widziane (przeze mnie)
 43. *John's having drunk milk was seen (by me)
 43a. *Jana wypicie mleka było widziane (przeze mnie)
 44. *Her having been scolding the baby was heard (by me)
 44a. *Jej karcenie dziecka było słyszane (przeze mnie)
 45. *Her having scolded the baby was heard (by me)
 45a. *Jej skarcenie dziecka było słyszane (przeze mnie)
 46. *The having been filling my eyes with tears was felt (by me)
 46a. *Wypełnianie moich oczu łzami było odczuwane (przeze mnie)
 47. *The having filled my eyes with tears was felt (by me)
 47a. *Wypełnienie moich oczu łzami było odczuwane (przeze mnie).¹³

Again, the given syntactic operations have produced ungrammatical sentences in both languages. Thus, this criterion is met neither by English nor by Polish perception verbs and exhausts the above-established factivity tests.

To recapitulate, this two-fold analysis has pointed to a weak correlation between perception and factivity both in English and in Polish. The verbs discussed exhibit total resistance to the relevant syntactic tests, thus proving to be syntactically non-factive. Nor are they full factives when tested for their semantic peculiarities. One-way implication relating them to their complements allows for the label 'implicatives' to be assigned to *see*, *hear*, *feel* and their Polish equivalents. More accurately, they should be referred to as semantically implicative verbs.

2.2. See, hear, feel as cognitive verbs

2.2.1. Semantic analysis

Consider the following sentences:

48. I saw that John hated TG
 48a. Widziałam, że Jan nienawidzi TG
 49. Did you see that John hated TG?
 49a. Czy widziałas, że(by) Jan nienawidzi(ł) TG?
 50. I did not see that John hated TG
 50a. Nie widziałam, że(by) Jan nienawidzi(ł) TG
 51. John hates TG
 51a. Jan nienawidzi TG
 52. I heard that Mary smoked grass
 52a. Słyszałam, że Maria pali trawkę
 53. Did you hear that Mary smoked grass?
 53a. Czy słyszałas, że(by) Maria pali(ła) trawkę?
 54. I did not hear that Mary smoked grass

¹³ Any attempt of fronting complement NP and converting it into a genitive case resulted in absolutely shocking combinations.

- 54a. Nie słyszałam, że(by) Maria pali(ła) trawkę
 55. Mary smokes grass
 55a. Maria pali trawkę
 56. I feel that she has burnt the cake
 56a. Czuje, że ona spaliła ciasto
 57. Do you feel that she has burnt the cake?
 57a. Czy czujesz, że(by) ona spaliła ciasto?
 58. I do not feel that she has burnt the cake
 58a. Nie czuję, że(by) ona spaliła ciasto
 59. She has burnt the cake
 59a. Ona spaliła ciasto

Examples 48 and 52 show that the assertions with *see*, *hear* in the main clause commit the speaker to the truth of the presuppositions expressed by their sentential complements (51 and 55, respectively). Thus, if we see or hear that something has happened, it is normally understood to be true, so the sufficient condition for the presupposition is fulfilled:¹⁴

60. $v(S) \supset S$, where $v \rightarrow$ *see*, *hear*
 $S \rightarrow$ *that S*

However, it is no longer true with interrogatives and negatives, cf. 49, 50, 53, 54, the situation being analogous to the meaning postulates of these verbs in their perceptive sense. Since questioning and denying of what was seen or heard affects the presupposition, the necessary condition for the truth of the complement expressing this presupposition does not take place.

The same one-way implication holds true for *widzieć* and *słyszeć*, cf. the corresponding a. examples, which, whenever affirmative presuppose the truth of their complements but do not commit the speaker to the belief that 51a, 55a, 59a are either true or false when questions or negations are formed.

Consequently, it leads us to the conclusion that *see*, *hear* and their Polish equivalents fail the semantic factivity test since the truth value of the propositions they appear in does not remain constant in questions and negations. The relation between them and their complements is that of entailment, as it was with their perceptive homonyms, thus they will also be called implicatives. However, *hear* requires one restriction, (cf. ft. 10), hence its label will be modified to 'weak implicative'.

Feel — on the other hand — is not factive at all, in that it expresses our convictions or beliefs rather than any objective state of affairs. Thus, subjective predictions, like 56, cannot have any impact upon the truth of their

¹⁴ Note the difference in meaning between the perception *hear* and its homonym which denotes 'getting the information' and not 'perceiving'. Hence, the meaning postulates are valid as long as the source of information is not questionable. *See*, on the other hand, can be paraphrased here as 'conclude on the basis of some apparent evidence'.

presuppositions, i.e., we do not infer from 56 that 59 is true. Similarly, the Polish examples lack this relation, so that neither *feel* nor *czuć* followed by *that S* and *że S*, respectively satisfy the criteria of factivity or implication.

To recapitulate, the three verbs under discussion whenever complemented by *that S* lose their perception characteristics, simultaneously exhibiting a diminishing degree of factivity (or rather implication) if we proceed from left to right on the following scale:

61. IMPLICATIVE \rightarrow WEAK IMPLICATIVE \rightarrow NON-IMPLICATIVE.

<i>see</i>	<i>hear</i>	<i>feel</i>
<i>widzieć</i>	<i>słyszeć</i>	<i>czuć</i>

see and *widzieć* are full implicatives; in the case of *hear* and *słyszeć* it is externally conditioned by the reliability of the source of information, whereas *feel* and *czuć* do not imply the truth of their presuppositions at all, thus are non-implicatives.

2.2.2. Syntactic analysis

Having established the degree of factivity characterizing the given English and Polish verbs according to their logico-semantic features the propositions involving them are worth checking against a set of syntactic criteria. This test is to investigate to what extent the structure of these propositions confirms our conclusions of 2.21. No specific syntactic description is needed here, thanks to the uniformity of both corpora as to their form:

62. $\text{Prop}_{\text{cog}} \rightarrow \text{XV}_{\text{cog}} + \text{that (S)}$, where $\text{V}_{\text{cog}} \rightarrow$

see	widzieć
hear	słyszeć
feel	czuć

*a proposition with cognitive verbs (hence the subscript *cog*) is to be rewritten as one of the cognitive verbs followed by a *that*-clause, where X is a variable. It is to be noted that these structures are labelled in Polish 'wypowiedzenie złożone z podrzędnym zdaniem dopełnieniowym', i.e. complex proposition with object subordinate clause, cf., Jodłowski (1976: 185). These introductory remarks have brought us to the analysis proper which will be carried out as above.

2.2.2.1. Extraposition

63. *It was seen (by me) that John hated TG
 63a. *Było widziane (przeze mnie), że Jan nienawidzi TG
 64. It $\left\{ \begin{array}{l} \text{seemed} \\ \text{appeared} \end{array} \right\}$ (to me) that John hated TG
 64a. Wydawało (mi) się, że Jan nienawidzi TG
 64'. It looked (to me) $\left\{ \begin{array}{l} \text{like, as if} \\ \text{that} \end{array} \right\}$ John hated TG
 64a'. Wyglądało (mi) $\left[\begin{array}{l} \text{jakby} \\ \text{na to, że} \end{array} \right]$ Jan $\left[\begin{array}{l} \text{nienawidził} \\ \text{nienawidzi} \end{array} \right]$ TG
 65. *It was heard (by me) that Mary smoked grass

- 65a. *Było słyszane (przeze mnie), że Maria pali trawkę
 66. It sounded (to me) $\left\{ \begin{array}{l} \text{like} \\ \text{as if} \end{array} \right\}$ Mary smoked grass
 66a. *Brzmiało (mi), jakby Maria paliła trawkę
 66b. Słyszalo (mi) się, jakoby Maria paliła trawkę
 67. *It is felt (by me) that she has burnt the cake
 67a. *Jest odczuwane (przeze mnie), że ona spaliła ciasto
 68. It feels like she has burnt the cake
 68a. Czuję się, że ona spaliła ciasto¹⁵

The propositions to be discussed here are derived by means of passive and extraposition transformations applied to the base structures of the form: $XV_{\text{cog}} + \text{that S}$. The English sentences 63, 65, 67 exhibit total ungrammaticality

if *see*, *hear*, *feel* are employed. However, when we use $\left\{ \begin{array}{l} \text{seem} \\ \text{appear} \\ \text{look like} \end{array} \right\}$, *sound like*,

and the active form of *feel*, respectively, then the transformations work neatly resulting in grammatical structures, like 64, 64', 66, 68. It is to be noted that both *like* and *as if* can be used with these suppletive variants, although the British speakers prefer the latter conjunction, considering the former to sound more American.

Similarly in Polish all extraposed sentences with the specified personal object *przeze mnie* 'by me', are also utterly unacceptable, cf. 63a, 65a, 67a. Nevertheless, they still have quite grammatical counterparts when the impersonal construction is used, (cf. ft. 15). At the same time, the Polish equivalents of the English examples with lexical suppletion (64a, 64a', 68a) are perfectly grammatical (note, however, the unacceptability of 66a, with the Polish equivalent of *sound*, i.e. *brzmieć*, where the impersonal construction 66b. must be used). Finally, the above examples show the parallel between the optionality of *to me (mi)* with paraphrases of *see*, *hear* in both corpora as opposed to the lack of a specified subject in impersonal constructions with *feel* and *czuje się*.

To conclude, extraposition works in an analogous way in both languages, rendering grammatical structures only when lexical suppletion with *see* and *widzieć* is involved. Thus, for these verbs the extraposition criterion is simply irrelevant, the reason being that without the necessary suppletive variants it is neither obligatory nor optional — but blocked. Consequently, the ana-

¹⁵ Note, however, the grammaticality of the same verbs in impersonal constructions with no object specified:

It was seen that John hated TG 'it was obvious that...'

Widziano, że Jan nienawidzi TG.

It was heard that Mary smoked grass.

Słyszano, że Maria pali trawkę.

Odczuwano, że ona spaliła ciasto.

lysis conducted above is not adequate for determining the factivity of these verbs in the combination $XV_{\text{cog}} + \text{that S}$. With the second verb under discussion lexical suppletion is again used in English, i.e., *sound* substituted for *hear*, whereas Polish employs impersonal construction, thus in the former case extraposition is irrelevant to the analysis of *hear*, and in the latter it is obligatory. Consequently, neither *hear* nor *słyszeć* meet the criterion of optionality of extraposition.

Finally, in the case of *feel*, no lexical suppletion is required, provided some syntactic and categorial changes are introduced. Namely, *feel* can no longer be passivized, otherwise the sentence is incorrect. Furthermore, *like* is substituted for *that*. Note the parallel between this structure with its Polish equivalent and an extraposed sentence with a full factive verb, the only difference being the lack of a prepositional object with *feel* and *czuć*:

69. It makes sense (to me) that $\left. \begin{array}{l} \text{she has burnt the cake} \\ \text{ona spaliła ciasto} \end{array} \right\}$
 69a. Ma sens (dla mnie), że
 70. It feels like
 70a. Wygląda na to, że

With *feel* and *czuć* extraposition is obligatory, cf. the ungrammaticality of:

71. *Like she has burnt the cake it feels¹⁶
 71a. *Jakby ona spaliła ciasto czuje się
 71b. *Że ona spaliła ciasto wygląda na to

Since with full factives this transformation is optional, neither of these verbs satisfy the second factivity condition.

In summary, it has been noticed that *see*, *hear*, *feel* in the syntactic configurations discussed share the transformational characteristics of their Polish equivalents. Namely, extraposition is either blocked or it is obligatory. On the basis of these observations it may be concluded that in both languages none of the three verbs qualifies as a factive predicate.

2.2.2.2. Subordinate clause NP fronting

If we turn the initial NP of the subordinate clause into the subject of the main clause, the operation will also trigger passivization and the conversion of the remaining part of the sentence into an infinitival phrase, cf. the following sentences:

72. *John was seen (by me) to hate TG
 72a. *Jan był widziany (przeze mnie) nienawidzieć TG
 73. John $\left\{ \begin{array}{l} \text{seemed} \\ \text{appeared} \end{array} \right\}$ to hate TG
 73a. Jan wydawał się nienawidzieć TG¹⁷

¹⁶ Assuming *like* to be the categorial variant of *that* here.

¹⁷ Note a similar synonymous sentence:

Wydawało się, że Jan nienawidzi TG.

which does not, however, contain an infinitival phrase.

- 73'. John looked like he hated TG
 73a'. Jan wyglądał na to, że nienawidzi TG
 74. *Mary was heard (by me) to smoke grass
 74a. *Maria była słyszana (przez mnie) palić trawkę
 75. *Mary sounded to smoke grass
 75a. *Maria brzmiała palić trawkę
 76. Mary sounded like she smoked grass
 76a. *Maria brzmiała jakby paliła trawkę¹⁸
 77. *She is felt to have burnt the cake
 77a. *Jest wyczuwana spalić ciasto

The situation is similar to that of the application of extraposition to our corpus. In this case also the series of rules render ungrammatical structures both in English (cf. 72, 74, 77) and in Polish, cf. the corresponding a. sentences. However, as was the case with extraposition, the same suppletive variants for *see* and *hear*, i.e., *seem*, *appear* or *look like* and *sound like*, respectively, form correct sentences in English, cf. 73, 73', 76. 75 is a somewhat dubious case, with *sound* substituted for *hear*, the *sound like* form being preferred. With *feel*, however, no substitution is possible, hence it cannot be used in this syntactic pattern at all. Again, as was noted above, this may be due to its subjective meaning involving personal opinions and convictions. If passivized, it loses its semantic overtones of a private verb. Thus, there arises a conflict between its semantic and syntactic representations.

What the analysis of the English verbs has shown is that in their pure form they satisfy this negative criterion for being factive as they disallow the operations of subordinate clause subject fronting followed by passivization and conversion of the rest of the sentence into an infinitival clause — transformations characteristic only of non-factive predicates.

The Polish corpus, on the other hand, supplies even stronger evidence. Not only are all the equivalent structures utterly ungrammatical, but even the sentences corresponding to the English ones containing suppletive variants are acceptable only in the case of *wyglądać* and *wydawać się* substituted for *widzieć*, the rest being incorrect (cf. 75a, 76a, 77a). Consequently, it may be concluded that the criterion under discussion supports our claim that factivity may be of some relevance in the interpretation of English cognitive verbs and their Polish equivalents.

¹⁸ According to some native speakers of English sentences 72 and 74 would be acceptable without the propositional phrase specifying the object of perception. Also, 76 means rather that her voice suggests drug addiction, not that we have got the information concerning that fact.

2.2.2.3. Gerundial constructions replacing *that*-clause

Consider the following examples:

78. *John's $\left\{ \begin{array}{l} \text{hating} \\ \text{hatred for} \end{array} \right\}$ TG was seen (by me)
 78a. *Jana nienawiść $\left\{ \begin{array}{l} \text{dla} \\ \text{do} \end{array} \right\}$ TG była widziana (przez mnie)
 79. John's $\left\{ \begin{array}{l} \text{hating} \\ \text{hatred for} \end{array} \right\}$ TG was apparent (to me)
 79a. Jana nienawiść $\left\{ \begin{array}{l} \text{dla} \\ \text{do} \end{array} \right\}$ TG była widoczna (dla mnie)
 80. *Mary's smoking grass was heard about (by me)
 80a. *Marii palenie trawki było słyszane (przez mnie)
 80b. *Palenie trawki przez Marię było mi znane ze słyszenia
 81. *Her having burnt the cake is felt (by me)
 81a. *Jej spalenie ciasta jest wyczuwane (przez mnie)
 81b. ?Spalenie ciasta przez nią było (dla mnie) wyczuwalne

If the sentences discussed in the previous section are exposed to the transformation converting infinitive phrases into gerundive nominals and triggering assignment of genitive case to the subject — ungrammatical constructions like 78, 78a, 80, 80a, 81, 81a result in both corpora. Lexical suppletion works only with *see* and *widzieć*, where a categorial change takes place, i.e., adjective is substituted for passivized verb. With the two remaining verbs, no suppletive variants can be found in English, whereas Polish offers a possibility of paraphrasing the ungrammatical sentences with passivized *słyszeć* and *czuć* (*wyczuwać*) by means of deverbal adjectives (or passive participles according to Polish terminology) to be substituted for the verbs. Note, that these participial forms must be preceded by *być* in the appropriate tense and person. Simultaneously, the genitive case noun modifying the subject of the sentence is moved to the post-NP position and changes its form into a prepositional phrase typical of passive sentences, e.g., *przez Marię* 'by Mary', *przez nią* 'by her'.

These remarks do not, however, affect the overall results of the nominalization and passivization test which when applied to the cognitive verbs proper has failed to prove their factivity either in English or in Polish. The results obtained above when confronted with the previous conclusions deny the correlation holding on the syntactic level between factivity and cognition as represented by *see*, *hear*, *feel* and their Polish equivalents. Thus, again the three verbs are in both languages assigned the label 'syntactically non-factive' whereas they belong to three different semantic categories characterized by decreasing degree of factivity, i.e., implicative, weak (or conditioned) implicative, and non-implicative, respectively.

3. CONCLUSION

In summary, the present investigation of the selected perception verbs and their cognitive homonyms in English and Polish has led to the conclusion that syntactically both types of predicates proved to be non-factive. Semantically, however, the notion of perception always involves implication between the predicate and its presupposition. On the other hand, cognition when expressed by predicates homonymous to those of perception cannot be treated in a uniform way, since there exists a scale which reflects the degree of implication holding between these verbs and their complements. Thus, cognitive *see* can be included among the implicative verbs, for *hear* some restrictions need to be stated, whereas *feel* is definitely a non-implicative verb.

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