Przemysław Pawelec
University of Wrocław

In Search of Polish Equivalents to Modern Phonological Terms in English: *Constraint* in Optimality Theory

The aim of this paper is to discuss the problems involved in finding the Polish equivalent for the term *constraint*, the key concept of Optimality Theory. The paper is part of work on the project outlined in Pawelec (2002), whose purpose is to update Polish phonological terminology.

1. Sources

There are very few sources that present modern Polish phonological terminology: Gołąb, Heinz, Polański (1968), Laskowski (1975), Anderson (1982), *Encyklopedia językoznawstwa ogólnego* (1999, hereafter: EJO) with phonology entries written by Roman Laskowski, and Szpyra-Kozłowska (2002). However, the terminology pertaining to Optimality Theory is absent in most of them, as the theory itself is new: its beginning is dated for 1993, when Prince and Smolensky's influential work *Optimality Theory: Constraint Interaction in Generative Grammar* started circulating (Prince and Smolensky 1993, published later as Prince and Smolensky 2004). Thus, the only generally available source that brings some OT terminology into Polish is Szpyra-Kozłowska (2002). Apart from this, the Optimality-theoretic terminology appears in Polish only occasionally, in reviews of master theses and doctoral dissertations, which are usually not available to the general public.

2. The problem of translation

One of the biggest problems with bringing the OT terminology into Polish is caused by the name of the key concept of OT: *constraint*. At first view the choice may seem obvious: a standard dictionary equivalent of the English word *constraint* in Polish is *ograniczenie* (*Wielki słownik angielsko-polski* 2002: 247, hereafter: WSAP), so this is the word that can be, and often has been, used as the equivalent of *constraint* in Optimality Theory. At a closer look, however, it turns out to have two disadvantages: first, it does not collocate well in combinations with other terms, and second, as a five-syllable word it is not a very convenient term to use (compare the case of the 'official' term *spółgłoska zwarto-szczelinowa* 'affricate' which in classroom discourse and in discussions among phonologists is usually replaced by much shorter '*afrykata*').

The main problem in choosing the Polish equivalent for *constraint* in OT is that as often as on its own, it is used in compounds (either as the head or as the modifier), where it has to agree with the other part of the complex form. The following are some of the most important compound terms with *constraint* in OT.

(1) a. *constraint* as the head
     faithfulness constraint
     markedness constraint
        context-free markedness constraint
        context-sensitive markedness constraint
     well-formedness constraint

  b. *constraint* as the modifier
     constraint ranking
     constraint violation
     constraint satisfaction

Some of the words that make up compounds with *constraint* in (1) are already present in Polish linguistic terminology. Let us review them one by one.

The terms *marked* and *unmarked* have well-established equivalents: *nacechowany* and *nienacechowany*.[1] As to *markedness*, Kazimierz Polański in EJO uses *nacechowaność*,[2] although it seems that *nacechowanie* is the more common form (e.g., it is the only form used in the sense of *markedness* in Szpyra-Kozłowska (2002)). The terms *context-free* and *context-sensitive* have for a long time had *bezkontekstowy* and *kontekstowy* as their Polish equivalents.[3] The dic-

---

[1] See, e.g., Gołąb, Heinz, Polański (1968: 363): the entry: **Nacechowany człon opozycji**.

[2] Kazimierz Polański in EJO: *nacechowany, nienacechowany*, but *nacechowaność* (the entry: **Nacechowaność** in EJO: 384; therein specific reference to *the theory of markedness* as *teoria nacechowaności*).

[3] See, e.g., Gołąb, Heinz, Polański (1968): the entries: **Bezkontekstowe gramatyki** (p. 79) and **kontekstowe gramatyki** (p. 299); EJO: 487: **Reguły bezkontekstowe** and EJO: 164: the entry

tionary equivalent for *well-formed* is *poprawny gramatycznie* (or just: *poprawny*) and *well-formedness* is *poprawność gramatyczna* (or: *poprawność*).[4] The term *ranking* can be rendered as *ranking*.[5] As to the equivalents of *faithfulness*, *violation* and *satisfaction*, these are less obvious.

The term *faithfulness*, introduced to phonology by OT, has, just like *constraint*, no established equivalent, but it seems reasonable to use *wierność* here, in agreement with its standard dictionary equivalent (WSAP: 424). There have been attempts to use *tożsamość*[6] or *identyczność*[7] for OT *faithfulness*, but it seems that these are better suited as the equivalents of the term *identity*, used for describing the properties of Faithfulness,[8] and in the names of particular faithfulness constraints, which are in English distinct from the general term *faithfulness*.[9]

The terms *constraint violation* and *constraint satisfaction*, along with the phrases '*to violate a constraint*' and '*to satisfy a constraint*', are used for describing the situations where a candidate for an output form does not agree (*violation*) or agrees (*satisfaction*) with a constraint. Szpyra-Kozłowska (2002: 210 ff) uses more than one equivalent for each of them. Here are some examples (in the quotations below I replace Szpyra-Kozłowska's Polish term for *constraint* with Z).

(2) a. *to violate a constraint*
         (forma) pogwałca Z; Z jest pogwałcana
         rażące naruszenie Z; ciągi (...) naruszają tylko po jednej Z
         Z jest łamana

     b. *to satisfy a constraint*
         (forma) jest zgodna z Z
         Z jest przestrzegana
         Z jest respektowana

The nominal forms are: *pogwałcenie, naruszenie* and *łamanie* for *violation* and *zgodność z*, *przestrzeganie* and *respektowanie* for *satisfaction*.

Let us now return to the problems involved in using *ograniczenie* for *constraint*. If OT *constraint* is rendered as *ograniczenie*, then with *wierność* as the

---

Fonologia generatywna by Roman Laskowski: 'Reguły fonologiczne mogą być regułami bezkontekstowymi, zwykle jednak są to reguły kontekstowe.'

[4] WSAP: 1342; the entry: **well-formed** *adj* (...) 2) *Ling [expression]* poprawny gramatycznie.

[5] See Szpyra-Kozłowska (2002: 211).

[6] Jerzy Rubach, personal communication.

[7] Szpyra-Kozłowska (2002: 212).

[8] McCarthy, J., Prince, A. (1994: 2): 'the dimensions of evaluation (...): Faithfulness ≈ "identity between input and output."'

[9] For example **IDENT-IO**(voice) ('Identity of input and output for voice' ['Identyczność (tożsamość) wejścia i wyjścia pod względem dźwięczności']), Kager (1999: 14).

equivalent of *faithfulness* the obvious candidate for the equivalent of *faithfulness constraint* is *ograniczenie wierności*. This, however, is rather unfortunate, because it suggests something which limits or reduces faithfulness, whereas in reality exactly opposite is true: a *faithfulness constraint* is a kind of constraint which requires that the output is identical (as regards some particular feature) with the input, i.e. that it is 'faithful' to the input. In other words, it is a constraint **connected** with faithfulness, but not a constraint **on** faithfulness. The term *ograniczenie wierności* suggests the opposite.

On the other hand, it fits in with the other important compound term, *markedness constraint*. The name *ograniczenie nacechowania* suggests something that reduces markedness, which is correct (markedness constraints are those that require that output forms are as unmarked as possible, even at the cost of being unfaithful to the input).

3. Szpyra-Kozłowska (2002): *zasada*

Szpyra-Kozłowska (2002) adopts *zasada* as the equivalent of *constraint* (actually, in the book both *ograniczenie* and *zasada* are used[10]). This solution has one advantage over *ograniczenie*: it combines well with *wierność*; *zasada wierności* (for *faithfulness constraint*) is not nearly as misleading as *ograniczenie wierności*. With its three syllables, *zasada* is also shorter than the five-syllable word *ograniczenie*. It has, however, two other drawbacks, which make it a rather unfortunate choice: it does not combine well with the Polish equivalent of *markedness*, and it introduces ambiguity by confusing two distinct terms: *constraint* and *principle*.

Note that although *zasada wierności* is an acceptable equivalent of *faithfulness constraint*, the matching equivalent of *markedness constraint*, *zasada nacechowania* (or *zasada nacechowaności*, to use Polański's term, EJO: 384), is misleading again: it suggests a kind of principle which makes markedness obligatory, or at least desirable,[11] which is not true.

The other drawback is connected with the term itself: *zasada* is not a very good equivalent of *constraint*, because it is already used as the Polish equivalent of *principle*. Using *zasada* as an equivalent of both *principle* and *constraint* obscures the difference between the two. Also, although this is debatable, it seems that the choice of *zasada* for *constraint* obscures the 'constraining' or 'limiting' connotations carried by the original English term.

---

[10] For example 'Jest rzeczą oczywistą, że zasady 1, 2 i 3 (...)'; and in the next paragraph, when referring to the same points: 'w języku polskim obowiązują ograniczenia 2 i 3, (...) zaś łamana jest zasada 1' (Szpyra-Kozłowska 2002: 209).

[11] Compare, e.g., in physics: *zasada zachowania energii* or *zasada wzrostu entropii*, which state, respectively, that the energy is preserved (*conservation of energy*) or that the entropy increases, rather than the opposite.

4. Other solutions

In the discussions which I have had with other phonologists, several other terms have also been offered for consideration: *przymus*, *nakaz*, *wymóg* and *warunek*. There has also been the case of a doctoral candidate's presentation where *ogranicznik* was used in the same sense.[12] I discuss them below.

It seems that the term *ogranicznik* can be dismissed right away: it has the weaknesses of the term *ograniczenie* (*ogranicznik wierności* would be something that reduces faithfulness) plus one more: my consultants agreed that it does not 'sound' well. On the other hand, *przymus*, *nakaz* and *wymóg* have both advantages and disadvantages. The good thing about them is that they are all short and they all refer to the 'mandatory' aspect of *constraint*. The word *przymus* is given as the second Polish equivalent of *constraint* in WSAP and *wymóg* is given as the equivalent of *constraint* in one of the phrases in the entry *constraint* there.[13] They also combine well with *wierność* (*faithfulness*): *przymus wierności*, *wymóg wierności* and *nakaz wierności* all reflect well what is meant by *faithfulness constraint*. Unfortunately, they all fail in the other combination: *przymus nacechowania*, *wymóg nacechowania* and *nakaz nacechowania* are even worse than *zasada nacechowania*, because they unequivocally indicate something that requires markedness, which is exactly opposite to what is meant by *markedness constraint* in English.

Apparently the term *nakaz* could be saved if we agreed to use **two** Polish equivalents for English *constraint*. Depending on the context, it would be rendered as either *nakaz* or *zakaz*.[14] Thus, *faithfulness constraint* would be *nakaz wierności*, while *markedness constraint* would be *zakaz nacechowania*.

At first view it seems that there would also be another advantage in distinguishing between *nakazy* (orders) and *zakazy* (bans) in this way: in Optimality Theory there are *positive constraints* ('something MUST BE present') and *negative constraints* ('something MUST NOT BE present' or 'DON'T DO (something)'). Examples are given below.

(3) a. *positive constraints*
   IDENT-IO (voice)
   'The specification for the feature [voice] of an input segment must be preserved in its output correspondent.'

   (Kager 1999: 14)

---

[12] Jerzy Rubach, personal communication. *Ograniczenie*, *warunek*, *ogranicznik* and *zasada* are already mentioned in Pawelec (2002: 144).

[13] WSAP 2002: 347: '**constraint** *n fml* 1) (*constriction*) ograniczenie *n*, (*compulsion*) przymus *m* **to put a constraint on sth** ograniczyć coś; **legal/formal constraints** wymogi prawne/formalne; **under constraint** pod przymusem *or* presją. 2) (*uneasiness*) skrępowanie *n*.'

[14] **nakaz:** i.a. *order*, *warrant*, *writ* (*Wielki słownik polsko-angielski* 2004: 534); **zakaz:** *ban*, *prohibition* (most phrases in the entry use *ban* as the equivalent of *zakaz*). (*Wielki słownik polsko-angielski* 2004: 1330).

LINEARITY-IO
'The output reflects the precedence structure of the input, and vice versa.'
(Kager 1999: 63)

  b. *negative constraints*

   *VOICED-CODA
Obstruents must not be voiced in coda position.
(Kager 1999: 14)

   *COR
Don't be a coronal.
(Rubach 2005: 15)

With *constraint* having two distinct equivalents, *nakazy* (orders) and *zakazy* (bans), a rule could be adopted that the term *nakazy* (orders) is used for *positive constraints*, while *zakazy* (bans) is used for *negative constraints*. Thus, the constraints in (3) could be translated into Polish as in (4).

(4) a. *nakazy*

   IDENT-IO (dźwięczna)
Specyfikacja cechy [dźwięczna] w segmencie wejściowym musi być zachowana w jego odpowiedniku wyjściowym.

   LINEARNOŚĆ-IO
Wyjście odzwierciedla strukturę następstwa wejścia i vice versa.[15]

  b. zakazy

   *DŹWIĘCZNA-KODA
Obstruenty w kodzie nie mogą być dźwięczne.[16]

   *KOR
Nie bądź głoską koronalną.

The two terms also collocate well in, e.g., *constraint ranking* (*ranking zakazów*) or *constraint violation* (*naruszenie zakazu, pogwałcenie zakazu* or *złamanie zakazu*).

    There are, however, three major disadvantages to this solution: it misses an important generalization, it is inconvenient in use, and it is misleading. I demonstrate that below.

    First, missing a generalization. It is one of the basic tenets of Optimality Theory, known as the principle of Parallelism, that 'all constraints pertaining to some

---

[15] I disregard the question of the equivalents of the terms *input* and *output*, using *wejście* and *wyjście*, respectively.
[16] I disregard the problem of the equivalent of the term *coda*, using *koda* here. For other solutions, see, e.g., EJO: 690: **zestęp sylaby**.

kind of structure interact in a single hierarchy' (Kager 1999: 25).[17] However, with separate names for *positive constraints* (*nakazy*) and *negative constraints* (*zakazy*), there would be no one common name for *constraints* in general, which would obscure this aspect of OT grammar. This is a serious drawback, which renders the proposed terminology rather untenable.

Second, inconvenient in use. In OT analyses it is often necessary to refer to *constraints* in general. With separate terms for two different kinds of constraints and no one common term for *constraint* in general, it would be necessary to constantly use the joint name *nakazy* and *zakazy* whenever constraints in general were discussed, which would be rather cumbersome.

Third, misleading terminology. Note that the distinction between *nakazy* and *zakazy* was introduced above to handle different semantic relationship between the two nouns of the compound in the terms *faithfulness constraint* and *markedness constraint*: in the first case a constraint **ensures** faithfulness, and in the second it **limits** markedness. We noticed that the difference could be reflected by using *nakaz* (*wierności*) for the former but *zakaz* (*nacechowania*) for the latter. At the same time we noticed that the difference between *nakazy* and *zakazy* corresponds well with two types of formulae used for constraints: 'DO (something)', or 'something MUST BE PRESENT' (*positive constraints*) and 'DON'T DO (something)', or 'something MUST NOT BE PRESENT' (*negative constraints*). The former would be *nakazy* (orders) and the latter *zakazy* (bans).

Unfortunately, these two kinds of contrast (*faithfulness constraints* vs. *markedness constraints* and *positive constraints* vs. *negative constraints*) do not always coincide. Contrary to what might seem from the selection of examples in (3) and (4) above, not all faithfulness constraints are positive and not all markedness constraints are negative. Thus, there are *positive faithfulness constraints*, *positive markedness constraints*, *negative faithfulness constraints* and *negative markedness constraints*. Examples are provided below.

(5) a. a positive faithfulness constraint
      IDENT-IO (voice)
      The specification for the feature [voice] of an input segment must be preserved in its output correspondent.

                                                                        (Kager 1999: 14)

   b. a negative faithfulness constraint
      Max-IO
      No deletion.

                    (Kager 1999: 102)

---

[17] See also: McCarthy, J., Prince, A. (1994: 3): '(1) **Principles of Optimality Theory** (...) [point] e. **Parallelism.** Best-satisfaction of the constraint hierarchy is computed over the whole hierarchy and the whole candidate set.'

c. a positive markedness constraint
   ONSET
   Syllables must have onsets.
                    (Kager 1999: 93)

d. a negative markedness constraint
   *VOICED-CODA
   Obstruents must not be voiced in coda position.
                    (Kager 1999: 14)

What is more, sometimes the same constraint is expressed once as negative, once as positive. Compare the following:

(6) a.***VOICED-CODA**
        Obstruents must not be voiced in coda position.
                    (Kager 1999: 14)

        *VOICED-CODA
        Coda obstruents are voiceless.
                    (Kager 1999: 325)

   b. **MAX-IO**
        Input segments must have output correspondents. ('No deletion')
                    (Kager 1999: 102)

In (6a) ***VOICED-CODA** is formulated once as a *negative markedness constraint* ('Obstruents **must not** be voiced in coda position.'), once as a *positive markedness constraint* ('Coda obstruents **are** voiceless.') – and both are given by the same source (Kager 1999). In (6b) the constraint is given at once in two alternative forms, as a *positive faithfulness constraint* ('Input segments must have output correspondents.') and as a *negative faithfulness constraint* ('No deletion') – not only by the same source but even in the same formula.

   This shows clearly that if we adopted the terminological distinction between *nakazy* and *zakazy*, we would have to use it only to distinguish the kinds of semantic relationship that hold between the modifier and the head noun in *faithfulness constraints* (*nakazy wierności*) vs. *markedness constraints* (*zakazy nacechowania*). As for the difference between negative and positive constraints, both *nakazy* and *zakazy* would have to be used for each of these two categories. This, in turn, means that in some cases a formula of the form 'something MUST NOT BE present' would be referred to as *nakaz* (if it were a faithfulness constraint) and in some other cases as *zakaz* (if it were a markedness constraint), while the formula of the form 'something MUST BE present' would also be referred to in some cases as *nakaz* and in other cases as *zakaz*. As a terminological distinction this is rather confusing.

   On the other hand, if we tried to maintain the distinction between *zakazy* as applying to the formulae of the form 'something MUST NOT BE present' and

nakazy as applying to the formulae of the form 'something MUST BE present', we would have to agree that a *positive markedness constraint* is a *nakaz* (as a *positive constraint*) which is a kind of *zakaz* (as a *markedness constraint*) while a *negative faithfulness constraint* is a *zakaz* (as a *negative constraint*) which is a kind of *nakaz* (as a *faithfulness constraint*). This, too, does not seem to be a desirable solution.

Generally, it seems that at the heart of the 'combinatorial' problems of all five candidates for the Polish equivalent of *constraint*, i.e. *ograniczenie*, *zasada*, *przymus, nakaz* and *wymóg*, is the difference between the structure of the terms *faithfulness constraint* and *markedness constraint* in English and the structure of their proposed equivalents in Polish. In English these are compounds, whereas in Polish these are noun phrases where the head noun in the nominative is modified by the NP in the genitive. The semantic relationship between the two nouns of a compound in English remains vague; the only thing that can be said certainly about a *faithfulness constraint*, before its technical meaning is explained, is that it is a kind of *constraint* which is somehow related to *faithfulness*. The same can be said about *markedness constraint*; it must be a kind of *constraint* which is somehow related to *markedness*. There is no requirement, however, that the precise semantic relationship between the modifier and the head noun *constraint* should be the same in both compounds. Consequently, there is nothing counterintuitive about a *faithfulness constraint* turning out to be a *constraint* that **ensures** *faithfulness*, and a *markedness constraint* turning out to be a *constraint* which **prevents** *markedness*. On the other hand, Polish noun phrases discussed above have a much more restricted meaning; in four out of five cases here, i.e. *ograniczenie*, *nakaz*, *wymóg* and *przymus*, they represent nominalisations of a verb phrase where the 'genitive' noun of the noun phrase corresponds to the compliment of the verb. Consequently, the semantic relationship between the modifier and the head noun of the noun phrase is determined by the semantic relationship between the verb and its compliment in the corresponding verb phrase – both for the equivalent of *faithfulness constraint* and for the equivalent of *markedness constraint*. These, however, are different in English; hence in Polish one of the equivalents is always inappropriate.

(7) a. ograniczenie wierności   ogranicza wierność
        nakaz wierności   nakazuje wierność
        wymóg wierności   wymaga wierności
        przymus wierności   przymusza do wierności

    b. ograniczenie nacechowania   ogranicza nacechowanie
        nakaz nacechowania   nakazuje nacechowanie
        wymóg nacechowania   wymaga nacechowania
        przymus nacechowania   przymusza do nacechowania

In the case of *zasada* the rule is less clear, so in this sense it is a more flexible candidate, but generally, the expected meaning of the names of the form *zasada czegoś* is that it is a principle (*zasada*) stating that something is present or applies (e.g., *zasada zachowania energii – energia jest zachowana*).[18] Thus, it is also inappropriate for expressing the relationship between *markedness* and *constraint* in *markedness constraint*, whose function is to eliminate, prevent, or reduce markedness.

Apparently, from the point of view of semantic clarity, the best result would be obtained if an adjective rather than a noun was used as the modifier. Thus, if *faithfulness constraint* were rendered in Polish as either *ograniczenie wiernościowe*, *zasada wiernościowa* or *przymus, nakaz* or *wymóg wiernościowy* and *markedness constraint*, accordingly, as *ograniczenie nacechowaniowe*, *zasada nacechowaniowa* or *przymus, nakaz* or *wymóg nacechowaniowy*, the actual meaning of the term would not contradict the expected meaning of the phrase. From the pragmatic point of view, however, this does not seem to be a good choice either – the terms *ograniczenie wiernościowe* and *ograniczenie nacechowaniowe* are neither elegant nor convenient to use and, arguably, better suited names should be chosen instead.

Another suggested term is *warunek*. This choice has two advantages: it is relatively short and it forms acceptable collocations. The OT meanings of *warunek wierności* and *warunek nacechowania* do not contradict the expected meaning of the noun phrases. However, it also has its weak points. One of them is the ambiguity brought to terminology by using *warunek* both for *condition* (its traditional equivalent) and for *constraint*. The other one is that the meaning of *constraint* in OT does not quite agree with what is normally understood by *warunek* in Polish. A *warunek* (i.e. a condition) is expected to have the 'IF ... THEN' structure, while OT constraints are unconditional ('something MUST BE present', 'something MUST NOT BE present', or 'DON'T DO something', without conditions); they may be considered 'conditional' only in the sense that they do not apply to structures which are not mentioned in them. In spite of this, however, *warunek* is arguably the most neutral and easy to adopt term that could serve as the equivalent of Optimality-theoretic *constraint* in Polish.

---

[18] Another expected meaning of *zasada czegoś* 'the principle of something' is that it is a principle which makes use of 'something'. This, however, more often applies to *reguła* 'rule', as in *reguła prawej dłoni* 'right-hand rule' or *reguła lewej dłoni* 'Fleming's left hand rule' in physics, where, accordingly, right hand and left hand are used to find out about the direction of a force.

References

Anderson, S.R. 1982. *Wprowadzenie do fonologii*. Translated into Polish by Edmund Gussmann. Wrocław: Ossolineum.

Encyklopedia językoznawstwa ogólnego. 1999. Wydanie drugie poprawione i uzupełnione. Polański, K. (ed.). Wrocław: Ossolineum.

Gołąb, Z., Heinz, A., Polański, K. 1968. *Słownik terminologii językoznawczej*. Warszawa: PWN

Kager, R. 1999. *Optimality Theory*. Cambridge: Cambridge University Press.

Laskowski, R. 1975. *Studia nad morfonologią współczesnego języka polskiego*. Wrocław: Ossolineum.

McCarthy, J., Prince, A. 1994. The Emergence of the Unmarked: Optimality in Prosodic Morphology. *Proceedings of the North East Linguistics Society* 24, 333–379.

Pawelec, P. 2002. "Updating Polish phonological terminology." *Anglica Wratislaviensia* 39, 141–147.

Prince, A., Smolensky, P. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Tech. Rep. 2, Rutgers University Center for Cognitive Science and Computer Science Department, University of Colorado at Boulder.

Prince, A., Smolensky, P. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Blackwell Publishing.

Rubach, J. 2005. "Mid Vowel Fronting in Ukrainian." *Phonology* 22, 1–36.

Szpyra-Kozłowska, J. 2002. *Wprowadzenie do współczesnej fonologii*. Lublin: UMCS.

Wielki słownik angielsko-polski. 2002. Linde-Usiekniewicz, J. (Chief Editor), Lewandowska-Tomaszczyk, B., Fisiak, J., Piotrowski, T. (Academic Consultants). Warszawa: Wydawnictwo Naukowe PWN.

Wielki słownik polsko-angielski. 2004. Linde-Usiekniewicz, J. (Chief Editor), Harris, E., Polański, K., Saloni, Z. (Academic Consultants). Warszawa: Wydawnictwo Naukowe PWN.