Conversion or zero affixation in Parallel Architecture

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Abstract

The question of whether conversion *or* zero affixation *is better as a name for the phenomenon that produces a new word without changing the form is addressed here against the background of Parallel Architecture (PA) as proposed by Jackendoff (2002). In PA, parallel linked phonological, syntactic and conceptual representations are assigned to linguistic expressions. As pointed out, there is a crucial difference between expressions stored in a speaker's mental lexicon (competence) and expressions constructed by using the mental lexicon (interpreted performance). In order to account for this difference, ten Hacken (2019) introduces a separate word formation component. Rules in this component have the purpose of naming, i.e. extending the mental lexicon. A number of examples of conversion or zero affixation in Dutch are discussed. As a result three types of zero affixation rule are identified, two of which qualify for word formation. The label* conversion *is reserved for the word formation rules. In a comparison with Jackendoff & Audring's (2020) Relational Morphology, the advantages of a separate word formation component triggered by naming are indicated, in particular the natural position of onomasiological coercion as an explanation of the kind and degree of semantic specification found in lexical entries compared to word formation rules.*

Keywords: *mental lexicon, word formation, naming, onomasiological coercion, transposition*

1 Introduction

The phenomenon of conversion or zero affixation consists in the formation of a new word without changing the form of the word. The question in the choice of *conversion* or *zero affixation* as a name is whether we are dealing with a process that does not change the form or with an affix that does not have a phonological reflexion. Here I will address this question against the background of Parallel Architecture (PA). Examples will be taken from Dutch. Section 2 introduces the basic assumptions of PA. Section 3 presents an example of conversion or zero affixation and discusses the different types of contrast represented by affixation. In section 4, I discuss the nature of word formation and contrast the conception of word formation in Jackendoff & Audring (2020) with an alternative approach developed in ten Hacken (2019). Section 5 develops an account of different types of conversion based on the assumptions in ten Hacken (2019). Section 6 summarizes the general implications of this discussion for the nature of conversion or zero affixation and for the interpretation of PA as a framework.

2 Parallel Architecture

Parallel Architecture (PA) is a framework of linguistic theory developed by Ray Jackendoff. Jackendoff (2002) gives an overview of the framework. In it, he brings together three strands of research from the 1970s and early 1980s. As a first strand we can see a theory of phrase structure. Although syntax is not the focus of Jackendoff's work, it is central in generative

linguistics. Jackendoff (1977) developed Chomsky's (1970) idea of X-bar theory. The basic idea of X-bar theory is that rewrite rules follow a pattern that relates phrases to corresponding lexical categories. However, whereas Jackendoff (1977) proposes a relatively flat structure that is determined by rules, Chomsky (1981) developed X-bar theory into a principle that replaces individual rules. With binary branching and an increasing range of functional categories, Chomsky's syntactic structures became ever further removed from the realized form of the corresponding sentences. As an alternative to the Chomskyan view, Culicover & Jackendoff (2005) present Simpler Syntax, an elaborated vision of how syntax can be treated in PA.

A second strand is a theory of the lexicon. Jackendoff (1975) elaborates another aspect of Chomsky (1970) and proposes the Full Entry Theory. Rejecting the idea that the lexicon should be a list of morphemes with only non-redundant information about them, a view elaborated by Halle (1973) and giving rise to Halle & Marantz's (1993) Distributed Morphology, Jackendoff (1975) assumes that words are fully specified in the lexicon. Instead of eliminating information about a word that can be derived from a rule, Jackendoff proposes that generalizations about words are formulated in such a way that the information covered by them does not count as a burden on storage to the same extent as idiosyncratic information. Relational Morphology, presented by Jackendoff & Audring (2020), can be seen as a development of this theory of the lexicon.

The third strand is a theory of meaning. This is not based on work by Chomsky. Instead, Jackendoff (1983) proposes the outline of a theory based on insights from the field of cognition. Jackendoff (1990) develops it as a theory of Conceptual Structure. In several articles, some of them republished in Jackendoff (2010), he subsequently elaborated individual aspects of this theory on the basis of specific phenomena.

Bringing together these three strands, Jackendoff (2002: 125) presents PA as the model in Figure 1.
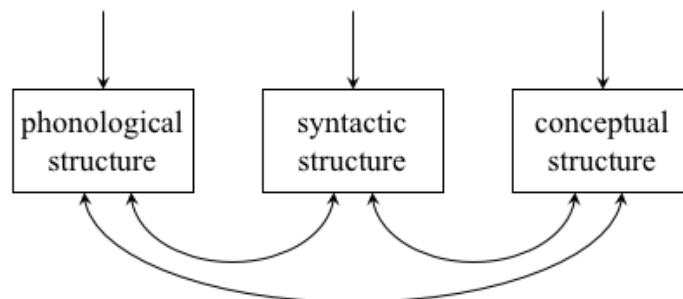

Figure 1: Parallel Architecture, after Jackendoff (2002: 125)

The idea in Figure 1 is that every linguistic expression is characterized by a phonological, a syntactic and a conceptual structure. These structures are not derived from each other, but each generated by their own set of rules, the arrows on top of each box. The fact that they are representations of the same expression is rendered by linking rules, the arrows between the boxes. Formally, rules generating a structure and rules linking two structures are not different. A rule is a specification of a partial structure. In a rule, each of the three structures can be addressed. If only one structure is addressed, it is a rule in one of the arrows at the top, if two or three are addressed, it is a linking rule. Lexical entries of the type exemplified in (1) are the simplest kind of linking rules.

(1)　　a.　*fiets*$_i$
　　　　b.　N$_i$
　　　　c.　[$_{Thing}$ BICYCLE]$_i$

In representations of linguistic expressions such as (1), I will give the three structures in the order they appear from left to right in Figure 1. Thus, (1a) is the phonological, (1b) the syntactic and (1c) the conceptual structure. The phonological form of the Dutch word *fiets* ('bicycle') is represented orthographically in (1a). As nothing of what I discuss here hinges on phonological aspects of the representation that are not rendered in orthography, I will generally use the orthographic form. The syntactic information in (1b) is restricted to the specification of the syntactic category. For the conceptual structure in (1c), I follow Jackendoff's convention of using allcaps and representing unanalysed concepts by words of general language. The coindexation between the three structures indicates that they refer to the same expression.

Every linguistic expression can be represented in PA. An example of the representation of a sentence is given in (2).

(2)　　a.　[*Anna*$_i$ *heeft*$_j$ *een*$_k$ *rode*$_l$ *fiets*$_m$]$_p$
　　　　　　'Anna has a red bicycle'
　　　　b.　[$_S$ [$_{NP}$ *Anna*]$_i$ [$_{VP}$ [$_V$ *heeft*]$_j$ [$_{NP}$ [$_{Det}$ *een*]$_k$ [$_{AP}$ *rode*]$_l$ [$_N$ *fiets*]$_m$]$_n$]]$_p$
　　　　c.　[$_{State}$ BE$_{poss}$ ([$_{Thing}$ BICYCLE; [$_{Property}$ RED]$_l$]$_n$, [$_{Location}$ AT$_{poss}$ [$_{Thing}$ ANNA]$_i$])]$_p$

The form of the sentence in Dutch is given in (2a), with the English translation in brackets. The syntactic structure in (2b) follows the general idea of a flat structure, but nothing hinges on the details of the analysis it implies. In (2c), the possessive reading of *have* is represented by means of the spatial predicates BE and AT, subscripted for the possessive field along the lines of Jackendoff (1983: 191–193). The coindexation in (2) indicates for individual parts how they correspond across the structures. Thus *rode* ('red') in phonology corresponds to the AP in syntax and to the Property in conceptual structure. Not every constituent needs to have a corresponding item at each level. Thus, there is no constituent corresponding to the NP *een rode fiets* ('a red bicycle') in (2a).

When we compare (1) and (2), the most striking difference is probably that (2) is much more complex. However, there is also another important difference. Whereas (1) is likely to be a lexical entry in the mental lexicon of every speaker of Dutch, (2) is not. In terms of the well-known distinction between competence and performance by Chomsky (1965: 4), we might say that (1) belongs to competence and (2) belongs to performance. Whether this is an accurate characterization depends on the precise interpretation of *performance*. As argued in ten Hacken (2007: 42–46), Chomsky uses *performance* to refer to the corpus data that serve as a basis for the type of linguistic research advocated by Harris (1951). This is a much poorer source of data than (2). It only includes the acoustic signal (or its orthographic rendering). The full structure in (2) is rather a model of the speaker's representation of the sentence before it is pronounced. We can also see it as the target for the hearer's representation after listening to and understanding the sentence. I will call (2) an instance of *interpreted performance*.

3 Conversion or zero affixation as word formation

The distinction between conversion and zero affixation corresponds to a difference in the analysis of contrasts of the type illustrated in (3).

(3)   a.   *Anna heeft een rode fiets.*
            'Anna has a red bicycle.'
    b.   *Anna fietst naar haar werk.*
            'Anna cycles to her work.'

The sentence in (3a) is the one represented in (2). It contains the noun *fiets* represented in (1). In (3b), we have the word *fietst*. This is the third person singular present tense of the verb *fietsen* ('cycle$_V$'). At first sight, there is no conversion or zero affixation here, because the form *fietst* has the suffix *-t* and the full verb *fietsen* has the suffix *-en*. However, these suffixes are inflectional. Dutch has a very modest degree of inflection, though slightly more than English. The inflectional paradigms of the noun *fiets* and the verb *fietsen* are given in (4) and (5).

(4)   a.   *fiets*   (singular)
    b.   *fietsen*   (plural)

(5)   a.   *fiets*   (1 sg. pres.)
    b.   *fietst*   (2 or 3 sg. pres.)
    c.   *fietsen*   (pl. pres.; infinitive)
    d.   *fietste*   (sg. past)
    e.   *fietsten*   (pl. past)
    f.   *gefietst*   (past participle)

Dutch nouns generally have two forms, illustrated in (4). Dutch verbs generally have six forms, illustrated in (5). The rules for the formation of each of these forms are not the same for all nouns and verbs, but apart from semantic constraints (e.g. mass nouns have no plural, weather verbs no first person), it is only a small class of auxiliary verbs that have a different set of forms.[1]

        The examples in (4) and (5) illustrate three types of contrast. The first type is exemplified by the pair in (4a) and (4b). In this case, the contrasting element constitutes a separate concept, independent of the one in (1c). This is shown in (6).

(6)   a.   *Bernard ziet de rode fiets op de brug.*
            'Bernard sees the red bicycle on the bridge.'
    b.   *Bernard ziet de rode fietsen op de brug.*
            'Bernard sees the red bicycles on the bridge.'

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[1] The imperative does not add extra forms. It uses (5a) and, in formal or archaic use, (5b) for the plural. In cases of inversion, (5a) is also used for 2 sg. pres. The present participle, *fietsend* is not used as a verb form, but only as an adjective.

The choice between the singular in (6a) and the plural in (6b) is independent of the selection of *fiets*. Another example of this type is the opposition between the present tense in (5c) and the past tense in (5e). In conceptual structure, the singular-plural contrast is represented by a separate concept.

The second type of contrast is the one we find in (5a) and (5b). In (7), the nature of this contrast becomes visible.

(7)   a. *Anna fietst naar huis.*
         'Anna cycles (to) home.'
    b. *Ik fiets naar huis.*
         'I cycle (to) home.'

The difference between the third person singular in (7a) and the first person singular in (7b) does not correspond to any separate concept, as in the case of (6), but is only a reflection of a property of the subject. Although in conceptual structure this property is represented in the subject, there is no reason to represent it as a property of the action expressed by the verb. Agreement of this type expresses technically redundant information, which will not be represented at conceptual structure.

The third type of contrast is what we observe in the opposition between (4) and (5). Whereas (4) can be rendered by the lexical entry in (1), (5) has a separate lexical entry, along the lines of (8).

(8)   a. *fiets*$_{i,j}$
    b. [$_V$ N$_i$]$_j$
    c. [$_{Event}$ GO ([$_{Thing}$ X]$^\alpha$, [$_{Path}$ Y]); [$_{State}$ USE ([$_{Thing}$ α], [$_{Thing}$ BICYCLE]$_i$)]]$_j$

The entry in (8) gives *fiets* as the form in (8a) and classifies it as a denominal verb without an affix in (b). In (8c) the meaning is expressed as a type of going. X and Y stand for the arguments that can be realized in the sentence. The agent X is a Thing and the second argument Y is a Path. After the semicolon, a modifier specifies that the agent, coindexed with α, uses a bicycle. The index *i* stands for the noun meaning *bicycle* and the index *j* for the verb. In dictionaries, e.g. van Dale (2022), (4) is represented as *fiets* and (5) as *fietsen*. This is because conventionally nouns are represented by their singular form and verbs by their infinitive. In (8), I use the stem of the verb as the representation, because it serves as the base form for all forms in (5).

The distinction between the three types of contrast can be summarized as follows. In (6), we have two separately selected concepts that are both realized in conceptual structure, one for the noun and one for the number. In (7), we have a formal contrast that is not separately realized in conceptual structure. In conceptual structure, the person contrast is realized in the representation of the subject, but not in the representation of the verb. In (8), we have a new concept with a new conceptual structure. A sentence such as (3b) does not introduce the noun *fiets*, but a different concept.

Jackendoff & Audring (2020: 96–99) discuss conversion in a section entitled "Conversions and other zero morphology". They give two examples, the singular and plural of *sheep* and the noun and verb *butter*. By grouping these together, they suggest that they are of a similar nature. However, in terms of the typology illustrated in (6) to (8), they represent

different types. In the case of *sheep*, the contrast is like (6) and ∅ represents a separate concept 'plural'. In the case of *butter*, the contrast is like the one between (1) and (8) and the two items name different concepts.

In relation to the question of whether *conversion* or *zero affixation* is the right term, Jackendoff & Audring's (2020: 96) section title is significant. *Conversion* refers to cases such as the contrast between (1) and (8). It produces a name for a new concept in the same way as derivation does. *Zero affixation* applies to a broader range of data. It covers all cases of a zero realization that are parallel to affixation, whether they name new concepts or behave like the examples in (6) and (7).

4 Word formation in PA

Jackendoff & Audring (2020) propose Relational Morphology (RM) as a theory of the lexicon in PA. Whereas morphology is traditionally concerned with the formation and the structure of words, RM reinterprets it as a theory of relations between words. What counts as a word is a theoretical decision. In PA, no principled distinction is made between words and rules. The syntactic rule combining a Determiner and a Noun can have the form of the lexical entry in (9).

(9) a. ∅
     b. [$_{NP}$ Det N]
     c. ∅

When we compare (9) with (1), the differences are only in the type of information that is specified for each of the three structures. (9) does not specify any information for phonological or conceptual structure and gives a structure for syntax. Jackendoff (2002: 167–177) uses the basic similarity between (9) and (1) in the representation of idioms. Idioms have more syntactic structure than (1b), but at the same time more phonological and conceptual information than (9a) and (9c). On this basis, Jackendoff (2002) argues that all of linguistic competence is expressed as lexical entries.

Jackendoff & Audring (2020) exploit this idea further and argue that any generalization about lexical entries is a lexical entry itself. In their discussion of *butter*$_N$ and *butter*$_V$, Jackendoff & Audring (2020: 98) propose a "Zero denominal verb schema", which can be rendered as (10).[2]

(10) a. …$_{i,j}$
      b. [$_V$ N$_i$]$_j$
      c. [F (Z$_i$)]$_j$

In the phonological representation, Jackendoff & Audring (2020) use … to stand for an unspecified form. The difference between (10a) and (9a) is that … provides a possible target for coindexation, but ∅ does not. The syntactic representation in (10b) is the same as that in (8b). In the semantic representation in (10c), F stands for a function that needs to be specified and Z is a variable referring to the meaning of the nominal base.

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[2] The differences between the representation in (10) and in Jackendoff & Audring (2020) are of a purely formal nature. Jackendoff uses different formalisms in his publications depending on the aspect of the expression he aims to highlight.

It is interesting to compare the nature of the lexical entries in (9) and (10). The entry in (9) combines, for instance, *de* and *brug* into the NP *de brug* ('the bridge') in (6) and *haar* and *werk* into the NP *haar werk* ('her work') in (3b). It is also responsible for the combination of *een* and *fiets* in (2). In this case another rule will add the adjective to produce the NP *een rode fiets* ('a red bicycle'). These NPs are generally not lexical entries. Although it is possible in principle that repeated use makes a speaker store an NP, because it is faster to retrieve a stored complex expression than to build it up from its parts, for most speakers of Dutch, most NPs resulting from (9) will not appear in their lexicon, but only in interpreted performance.

The lexical entry in (10) has a completely different function. It is meant to relate the lexical entries for the noun *fiets* in (1) and the verb *fietsen* in (8). Instead of being used directly to build up an expression of interpreted performance, (10) is first of all used in competence. It contains an underspecified function F in (10c), which needs to be made specific in order to use the entry in a particular instance.

We can observe the same contrast when we consider the difference between (2) and (8). In (2), we have the PA representation of a sentence. Although sentences can be stored in a speaker's mental lexicon, for this sentence there is little reason that it is for any Dutch speaker. The sentence can be formed and interpreted compositionally at any time it is necessary. In (8), however, we have the PA representation of a complex word. Although the meaning of the word is motivated, it is not compositional. Only Dutch speakers who have (8) in their mental lexicon can use this word without restriction.

The contrast between (2) and (8) points to a fundamental difference between interpreted performance and the lexicon as a representation of competence. The contrast between (9) and (10) illustrates the fundamental difference between lexical entries used as information to build up interpreted performance and word formation rules used to produce new associations between names and concepts. Ten Hacken (2019) uses this distinction as an argument that word formation in PA should not be included in the structure of Figure 1 together with other lexicon entries, but constitutes a separate component. Whereas the lexicon is used to construct expressions of interpreted performance such as (2), word formation rules change the lexicon, i.e. their function is to adapt a speaker's competence. Whereas interpreted performance is used directly in communication and subject to general pragmatic principles in interpretation, word formation is used in naming and subject to onomasiological coercion. This opposition is elaborated in ten Hacken & Panocová (in press).

The use of the lexicon in the production of expressions in interpreted performance is a matter of combining information from selected lexical entries. This use of the lexicon can be modelled as a purely declarative interpretation of the entries, based on a kind of unification of the information they contain. The use of word formation rules for the creation of new lexical entries as names for concepts cannot be modelled in this way. The application of word formation rules is governed by onomasiological coercion. This means that at the start of naming, the meaning of the name to be chosen is already fixed. It is not determined by the word formation rule. At most, semantic restrictions in word formation rules can influence which word formation process will be selected as the basis for the new name. Therefore, we should not expect that there is a word formation rule that bridges the gap between the entries in (1) and in (8). Rather, onomasiological coercion says that (8c) is determined first and then a plausible word formation rule and base are looked for that can be interpreted as close enough to (8c) to be accepted.

The use of the function F in (10c) deserves more attention in this respect. If (10) were a regular lexical entry, we would need a process of gradually narrowing it down in particular instances, so that it becomes specified as (11) in the case of the verb *fietsen*.

(11) [$_{\text{Event}}$ GO ([$_{\text{Thing}}$ X]$^\alpha$, [$_{\text{Path}}$ Y]); [$_{\text{State}}$ USE ([$_{\text{Thing}}$ α], [$_{\text{Thing}}$ #])]]

The entire expression in (11), except for # marking the position of Z, corresponds to F in (10c). The obvious question is, then, where all the details in the specification in (11) come from. How do we get the functions GO and USE and the relation between them? Onomasiological coercion approaches the entire question from a different angle. There is no need to find the expression in (11), because it is included in the starting point of naming. We already have (8c) when naming is invoked. F in (10c) is not an underspecified function that needs to be determined, but the set of constraints that determine whether (10) is a good word formation rule for this particular naming action.

Whereas new sentences are easily accepted as far as they respect general grammatical constraints, new words are much harder to accept. First of all, there must be a sense in the speech community that a new word is needed for a particular concept. Ten Hacken & Panocová (in press) call this *onomasiological motivation*. Then, a speaker has to come up with a form that is accepted by the speech community for this concept. This acceptance is not a matter of pragmatic forces, but depends on members of the speech community willing to memorize the new word in their mental lexicon.

5 Conversion as word formation in PA

Word formation is one of the three main naming mechanisms in language. The other two are sense extension and borrowing. Word formation is the only rule-based naming mechanism. A word formation rule produces a new lexical entry in a speaker's competence on the basis of one or more existing ones. Here, we will only consider cases with a single input entry. Ten Hacken (2019: 70) proposes a classification of possible word formation rules on the basis of which of the structures in Figure 1 they affect. This classification is summarized in Table 1.

Table 1: Typology of word formation rules

Type	Phonological	Syntactic	Conceptual
7	1	1	1
6	1	1	0
5	1	0	1
4	1	0	0
3	0	1	1
2	0	1	0
1	0	0	1
0	0	0	0

In Table 1, the Type number corresponds to a reading of the following three columns as a binary number. Zero affixation is marked by a 0 in the column for phonological structure. Of the four types that have this property, Type 0 is not really a rule, because it does not change anything. Type 3 is identified by changing both the syntax and the conceptual structure of its input. An example is the conversion rule deriving the verb *fietsen* ('cycle') in (8) from the noun *fiets* ('bicycle') in (1). Syntactically, this rule changes a noun into a verb and conceptually it changes a Thing into an Event. Compared to Jackendoff & Audring's (2020: 98) entry in (10), a word formation rule specifies input and output. For noun to verb conversion, ten Hacken (2019: 71) gives the rule in (12).

(12)   a. $[Wd]_p$ $\Rightarrow$ $[Wd_p]_q$
          b. N_p $\Rightarrow$ V_q
          c. $[_{Thing} X]_p$ $\Rightarrow$ $[_{Event} PF (\ldots, X_p, \ldots)]_q$

Whereas (10) is formalized as a lexical entry adding information to a structure, (12) is a word formation rule that applies to a lexical entry and produces a new lexical entry. In (12a), it is specified that no phonological change takes place. The same form *Wd* has the index *p* of the input and the index *q* of the output. In (12b), a noun is turned into a verb. In (10b), the nominal base is specified in the syntactic structure, although it does not play any role as part of the resulting verb. There is no sense that the syntactic structure that is part of the interpreted performance of a sentence with the verb *fietsen* in it should have a noun embedded in its representation of *fietsen*. The nominal origin is information of a different level. It pertains to etymology. As far as etymology is represented, it is part of a speaker's competence, not of interpreted performance. In (12c), a more specific characterization of the semantic consequences of the operation is given than in (10c). The input is of the category Thing, the output of the category Event and the function is determined as PF, i.e. the proper function of the Thing in the input.[3]

      While Type 3 is no doubt the most common type of conversion, the systematic classification in Table 1 predicts that there should also be rules of Type 2 and Type 1. In fact, conversion in Dutch is not only found in verbs derived from nouns, but also in the other direction. In (13), we have an example of an event noun derived from a verb.

(13)   a.   *Ceciel overweegt een auto te kopen.*
             'Ceciel considers buying a car.'
             (Lit. 'Ceciel considers a car to buy.')
         b.   *Ceciel overweegt de koop van een auto.*
             'Ceciel considers the purchase of a car.'

In (13a), the verb *kopen* ('buy') is used in the infinitive. In (13b), the noun *koop* ('purchase$_N$') is used instead. The two sentences in (13) have the same meaning. The differences in wording depend only on the choice of the syntactic category of the complement of the verb *overwegen* ('consider'). In (13a), the verbal nature of *kopen* triggers the use of a direct object *een auto* ('a

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[3] The concept of *proper function* (PF) is introduced in PA by Jackendoff (2009: 120). He refers to Millikan (1984: 17), who describes it as "[h]aving a proper function is a matter of having been 'designed for' or being 'supposed to' (impersonal) perform a certain function". It is closely linked to Pustejovsky's (1995: 76) telic quale.

car') and the verb is in final position. In Dutch, verbs are generally at the end of the clause, except for the inflected verb in a main clause, which appears in second position.[4] In (13b), the nominal nature of *koop* requires the object to be marked by the preposition *van* ('of'). Prepositional arguments and modifiers of nouns generally follow the noun. Despite the phonological and syntactic differences, (13a) and (13b) express the same meaning, so that they will have the same conceptual structure. Both the verb *kopen* and the noun *koop* designate an event. In (13a) and (13b), they designate the same event. Therefore, the rule deriving the noun from the verb is a rule of Type 2.

Traditionally, rules that change the syntactic category but do not change the meaning are classified as transposition. Based on ideas from Bally (1922: 119) and Sechehaye (1926: 102–111), ten Hacken (2015: 196) defines *transposition* as in (14).

(14)   Transposition is a process that
      a.   changes the syntactic category of a word,
      b.   does not change its semantic category, and
      c.   does not modify, add or delete any semantic features.

When we compare the definition in (14) with the motivation for having word formation as a separate component in PA, it is obvious that they are not compatible. When a process does not change the semantic category or any semantic features, it is not possible to use it for naming concepts. As *koop* in (13b) refers to the same concept as *kopen* in (13a), it cannot serve as a new association of a name with a concept. The status of *koop* in relation to the verb is more similar to that of inflected forms as in (5). This reasoning applies to all types which have a zero in the last column in Table 1.

When we distinguish between Type 3 as a part of word formation for *fiets* and *fietsen* in (4) and (5) and Type 2 as excluded from word formation for *koop* and *kopen* in (13), we need a solution for cases where the same form is used in both senses. An example is *druk* in (15).

(15)   a.   *de tijd om het boek te drukken*
          'the (amount of) time (required) to print the book'
          (Lit. 'the time COMP the book to print')
      b.   *de tijd voor de druk van het boek*
          'the time for the printing of the book'
      c.   *de vierde druk van het boek*
          'the fourth edition of the book'
          (Lit. 'the fourth printing of the book')

In (15a), we have a case of the verb *drukken* ('print'), which has the stem *druk*.[5] In (15b), we have the noun *druk*. The contrast between (15a) and (15b) is parallel to the one in (13a) and (13b). In (15a, b), the head is the noun *tijd* ('time'). In (15a), it has a clausal complement with the complementizer *om*. In the gloss, *om* is rendered as COMP. In translations into English, it is

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[4] In imperatives and direct yes/no questions, the verb appears in first position. Extraposition can move NPs or PPs to the end of a sentence, especially if they are long. Such cases are not crucial here.

[5] The verb *drukken* has also other meanings, e.g. *een knop drukken* ('a button press', i.e. press a button). These meanings do not play a role in the analysis here.

usually sufficient to use infinitival *to*. As *drukken* is a verb form, *het boek* can be a direct object. In (15b), *tijd* has a PP-complement with the preposition *voor* ('for'). As *druk* is a noun, *het boek* must be introduced by the preposition *van* ('of').

When we now turn to (15c), we see a different but related use of the noun *druk*. It refers to the production of additional copies of a publication after it was out of print. Especially in the period before print-on-demand, two concepts were distinguished, as expressed in (16).

(16) a. *tweede oplage*
          'second printing'
      b. *tweede druk*
          'second edition'

For an author, the distinction between (16a) and (16b) is important. In the case of (16a), it may be possible to correct typographical errors or update references of publications that were in press, but no substantial changes are possible. In the case of (16b), the text can be revised or expanded. A well-known case in the domain of morphology is Marchand (1969), who adopted (his interpretation of) Lees's (1960) transformational-generative theory to the analysis of compounding in the second edition of his overview of English morphology. It is also not uncommon in (16b) to add a new chapter covering a new topic. This demonstrates that *druk* is used for naming in (15c), as opposed to its transpositional use in (15b). Such oppositions also occur for nouns with an affix. Ten Hacken (2023: 140–144) discusses cases such as *vertaling* ('translation'), derived from *vertalen* ('translate').

For an analysis of the verb *drukken* and the noun *druk* in (15), it is important to see that the two readings of the noun are related by a regular process. In the same way as *vertaling* can refer to the process of translating and to the resulting target text, *druk* can be used for the process in (15b) and its result in (15c). As this is a regular process, we can set up a rule for it. In terms of the typology in Table 1, this rule will be a rule of Type 1. It changes the meaning, as the input is an event, whereas the output is a thing, but it does not change the syntactic category (noun) or the phonological form (*druk*, *vertaling*). What I propose, then, is that the noun *druk* in (15b) is derived from the verb *drukken* as used in (15a) by a transposition rule, a rule of Type 2. The noun *druk* in (15c) is not directly derived from the verb, but from the noun as used in (15b) by means of a rule of Type 1.

At this point, two remarks about Type 1 rules in general and about the application of the rule to *druk* are in order. First of all, the precise meaning of *druk*, including the contrast in (16), is not the result of a word formation rule. The contrast in (16b) illustrates onomasiological coercion. In Dutch, as in English, different words were required to distinguish two concepts with a similar meaning. That *druk* has one of these meanings and not the other is because the relevant section of the speech community, i.e. people who determined the correct meaning of terms in the publishing industry, chose *druk* for this meaning.

Secondly, it is important to distinguish rules of Type 1 from sense extension. A Type 1 rule is a word formation rule. It specifies how the meaning of the output relates to the meaning of the input by means of conceptual categories. In the case of *druk*, the input is an event and the output a thing that comes into being in the course of the event. This is specific in the same way as the rule for the formation of agent or instrument nouns from verbs with *-er* determines the meaning of the resulting noun. It contrasts with sense extension. In sense extension we can use *flessehals* ('bottleneck') for a point in a road system where traffic jams tend to occur. Here

the input and the output are both things and their relation is metaphorical. Although metaphorical relations are not random, they are by no means as clearly constrained as word formation rules and they do not change the semantic category. Metaphor is rather a general cognitive category. In both word formation and sense extension, onomasiological coercion applies, because it is a general property of naming.

6 Conclusion

When we consider the analysis of conversion or zero affixation in Dutch, we have to take into account that it is a process relating lexemes. The distinction between conversion and derivation is that, whereas derivation has an overt affix, conversion does not. However, this identity of form should be tested not at the level of individual word forms, but for lexemes. We can see this in (4) and (5), listing the word forms of the lexemes *fiets* ('bicycle$_N$') and *fietsen* ('cycle$_V$').

   The distinction between *conversion* and *zero affixation* as names for a phenomenon reflects first of all a difference in perspective. *Zero affixation* highlights the effect on the form, whereas *conversion* brings it in line with derivation. As such, one might also call the first person singular *fiets* in (5a) a case of zero affixation. *Conversion* can only be used as a characterization of the relationship between the lexemes in (4) and (5).

   In PA, as presented by Jackendoff (2002), a linguistic expression has linked representations of its phonological, in syntactic and conceptual structures. As argued in section 2, this triple of linked representations can be used both to represent entries in the speaker's mental lexicon and what I call *interpreted performance*, i.e. the representation of complex expressions with their form and interpretation. Interpreted performance exists in the speaker's mind before the expression is produced and serves as a target for its interpretation by the hearer.

   The distinction between the mental lexicon and interpreted performance is important, because it explains the difference between word formation and sentence formation. Entries of the mental lexicon have the purpose of contributing to the formation of expressions in interpreted performance, typically sentences. Word formation rules have the purpose of extending a speaker's mental lexicon by creating new associations between a name and a concept. In the choice between *conversion* and *zero affixation*, I prefer *conversion* as the term to be used for the word formation process.

   In sections 3 and 5, I presented three examples of conversion or zero affixation. They are listed in (17).

(17)   a.   *fiets*
            'bicycle'
       b.   *koop*
            'purchase'
       c.   *druk*
            'print'

In (17), the examples can be thought of as nouns or verb stems, as they are the same. In terms of a word formation analysis, we saw that the examples in (17) belong to three different types. In (17a), the verb designates an activity that involves the thing referred to by the noun. This is

a typical word formation relationship. It changes the syntactic category as well as the conceptual category and belongs to Type 3 in the classification in Table 1. In (17b), we have a transposition. There is a change of syntactic category, but the conceptual representation remains unaffected. As I argued, transposition rules do not belong to word formation, because they cannot be used to name new concepts. They belong to Type 2. In (17c), the noun is ambiguous. It can be a transposition or designate a new concept, the result of the action referred to by the verb. In section 5, I argued that in such cases, the noun that is a transposition is formed first. It is the result of a Type 2 rule like the noun in (17b). The result noun is derived from the process noun that is the output of the Type 2 transposition rule. The logical classification in Table 1 predicts rules of this type in Type 1.

Jackendoff & Audring (2020) elaborate a different model of the lexicon within PA, which they call RM. In RM, naming does not play a role. Expressions are assigned structures independently of whether they are part of a speaker's mental lexicon or not. Any expression may be stored when it is useful for language processing. As argued in section 4, RM fails to explain where the details of the conceptual structure of a new word come from. There is a mismatch between the conceptual information in the conversion rule with F in (10c) and the required specification in the entry for the verb *fietsen* in (8c). The specification of F is formulated in (11). In RM, connections are made between lexical entries for words and for rules, but no attempt is made to explain where additional information in the words comes from.

In the model with a separate word formation component proposed by ten Hacken (2019), a solution is offered. Instead of a lexical entry as in (10), we have a word formation rule as in (12). This word formation rule is triggered by naming. In naming, the starting point is a concept. Therefore, there is no need to specify F in (10c) as (11). Instead, the conceptual representation in (8c) is the starting point for naming. The result of naming is an entry with the meaning that triggered the naming process. This is onomasiological coercion.

In this context, we can answer the question of conversion or zero affixation in the sense that conversion is the origin of (17a) and of the result reading of (17c). We can consider all of (17) zero affixation. Conversion belongs to word formation. Zero affixation may or may not belong to it.

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