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Abstract This article demonstrates that the most common prosodic realization of focus can be subsumed typologically under the notion of alignment: a focused constituent is preferably aligned prosodically with the right or left edge of a prosodic domain the size of either a prosodic phrase or an intonation phrase. Languages have different strategies to fulfill alignment, some of which are illustrated in this paper: syntactic movement, cleft constructions, insertion of a prosodic boundary, and enhancement of existing boundaries. Additionally, morpheme insertion and pitch accent plus deaccenting can also be understood as ways of achieving alignment. None of these strategies is obligatory in any language. For a focus to be aligned is just a preference, not a necessary property, and higher-ranked constraints often block the fulfillment of alignment. A stronger focus, like a contrastive one, is more prone to be aligned than a weaker one, like an informational focus. Prominence, which has often been claimed to be the universal prosodic property of focus (see Truckenbrodt 2005 and Büring 2010 among others), may co-occur with alignment, as in the case of a right-aligned nuclear stress, but crucially, alignment is not equivalent to prominence. Rather, alignment is understood as a mean to separate constituents with different information structural roles in different prosodic domains, to 'package' them individually.

Keywords Focus · Prosodic structure · Syntax-phonology · Typology · Alignment

1 Introduction: alignment and prominence

This article proposes that focus universally tends to be aligned prosodically with the right or left edge of a prosodic domain. In aligning a focused and a prosodic constituent, morpho-syntax is also involved, since edges of prosodic constituents often

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fall together with edges of syntactic constituents (Chen 1987; Gussenhoven 1983, 1992; McCarthy and Prince 1993; Selkirk 1986, 1995, 2009; Truckenbrodt 1995, 1999, 2007, among many others). Alignment is thus understood as correspondence between the edge of a syntactic and/or phonological constituent and the focused part of the sentence. The relevance of prominence is also acknowledged in the expression of focus, but it is argued that alignment and prominence are separate prosodic correlates, and that alignment is more frequent than prominence.

Consider the following example. In an SVO sentence denoting a simple action, in which an agent and a patient are involved, like *Sara paints houses*, the referents can bear different information structural roles. In a context in which it is known that somebody paints houses, and in which it has been asked who that person is, *Sara* is narrowly focused in the answer, as it denotes the new information in the context. The claim made in this paper is that, in such a situation, it is universally preferable to align *Sara* with the edge of a prosodic constituent. Similarly, if *houses* is the focus, for example in a context where it is asked what Sara paints, the answer *houses* is preferably aligned. In this latter case, nothing happens in the grammar of English, since *houses* is perfectly aligned with the right edge of an intonation phrase, at least in the unmarked word order. In the first case however, *Sara* is not right-aligned with an intonation phrase by default. Something has to happen in the grammar to improve the alignment of this constituent or to render this constituent prominent.

As will be shown in detail below, languages differ as to which prosodic constituent is involved in the alignment, though probably most languages tend to align focused constituents with an intonation phrase (henceforth 'ι-phrase', abbreviated as ι), as English does. However, because of their rigid syntax, some languages have to be content with alignment at a lower level (prosodic phrase, here ɸ-phrase, abbreviated as ɸ).

It is often claimed that prosodic 'prominence' is the only prosodic correlate of focus (see for instance Büring 2010; Gussenhoven 2008; Jackendoff 1972; Reinhart 1995; Truckenbrodt 1995, and Zubizaretta 1998 for this assertion). In fact, the claims made in this article owe much to Truckenbrodt's (1995) theoretical work and to Büring's (2010) review of the cross-linguistic facts concerning the grammar of focus, inserted in Truckenbrodt's theoretical framework. The present work builds upon their assumptions, but it additionally introduces a distinction between alignment and prominence that neither of them do. In their approaches, constituents are aligned in order to obtain prominence: once they are aligned, they become prominent. For them thus, alignment is not a purpose per se, but only a means to an end. See also Sect. 6.1 for more details on Truckenbrodt's approach, and Sect. 7.3 for a discussion of Büring's proposal.

This view of focus as prominence is well motivated for English and German, among other languages. Indeed the notion of prominence in Jackendoff's terms is equivalent to a pitch accent. In English, the last accent of a sentence is called 'nuclear' as it is felt to be more prominent than the others. It is the default nuclear stress position, often standing for several focus structures embedded into each other (Chomsky 1971; Selkirk 1995). It is then economical to align the focus with this position. For other languages, however, the obligatory equivalence between alignment and prominence may not be convincing, as we will see below.

It is proposed here that alignment and prominence should be treated as two separate phenomena, which can fall together, and often do, but do not necessarily have to. Not all languages associate focus with prominence, but all languages try to align focus prosodically. It will be shown that alignment may be obtained in the absence of prominence. Conversely, prominence can be present without alignment. Of the two, alignment is achieved much more often than prominence, and, for this reason, it is to be considered as the primary correlate of focus.

From a more technical perspective, the assignment of a pitch accent does not automatically imply the insertion of a prosodic boundary. It is important to understand that my approach is compatible with a marked option: focus may prefer to be aligned at one edge of a prosodic domain while some kind of prominence is found at the other edge. It does not categorically ban the existence of such a language. For instance Nɬeʔkepmxcin, discussed in Sect. 4.2.2 can be considered such a language. And in French, the *accent d'insistance*, corresponding to a narrow focus, may be located to the left of a *syntagme phonologique* but a focus or an *accent logique* is arguably aligned to the right (see Sect. 4.1.2).

The new 'focus as alignment' model (FA) proposed in this paper makes different theoretical assumptions from Truckenbrodt's and Büring's 'focus as prominence' model (FP). First, FA posits that alignment and prominence are distinct. In this case, 'prominence' needs a definition that is independent of alignment, and conversely, the definition of alignment is independent of prominence. A prominent constituent is realized with acoustic correlates that increase its perceptibility: such a constituent is prominent if it has higher pitch, greater intensity, longer duration or the like. In sum, in order for a word to be prominent, it has to be associated with acoustic prominence, as in the original definition of Jackendoff (1972). Alignment is defined in (9) in Sect. 2: a constituent is aligned with another constituent if their edges fall together. In short, if a focused constituent is just aligned, with no other acoustic cue, FA is the right approach. By the same logic, FP is the right way to explain focus if acoustic prominence is added to the focus, and if alignment is realized with acoustic prominence. But in fact, in FP, prominence is defined as an abstract metrical element that is automatically associated to an aligned element (see Selkirk 2000:238; Büring 2010:180 and below for a more detailed discussion). With such a definition, alignment and prominence cannot be separated. Circularity cannot be avoided, and the claim cannot be falsified, since being aligned is synonymous with being prominent.

Second, if focus is aligned per default—as a consequence of canonical word order—non-realization of focus is predicted by FA, but not necessarily by FP, because prominence may be obtained by correlates other than alignment. FA predicts that focus is often left unmarked when it is aligned per default, since focus as alignment is then fulfilled. In the FA model, if alignment is fulfilled by default, word order is left untouched, no special or higher pitch accent is required, phrasing is also not manipulated and no special morpheme is inserted. And indeed, in every language, focus is sometimes realized with marked grammatical reflexes, and sometimes it is left unmarked. However, a focus that is not aligned per default needs something special in order for the hearer to be able to perceive it as such. It is claimed here that this something special is often alignment, and sometimes prominence. By contrast, FP needs alignment to correspond to pitch accent or to another kind of phonetic promi-

nence. Even if alignment is sometimes claimed to be enough to fulfill prominence, prominence should also be obtained independently of alignment.

These clear differences between the two proposals will be used to evaluate the models in Sect. 7.

In positing that a focus tends to be aligned with a prosodic constituent, there is no need to appeal to syntactic positions with information structural content, like Focus-Phrase, or to positions in the phonological string which are claimed to be intrinsically prominent, like the initial or the preverbal one. There is also no syntactic operation which explicitly targets 'focus,' 'givenness' or 'topic'; see Rizzi (1997) and many others for a different point of view. Languages have at their disposal several possible linearizations per set of constituents, and these linearizations are constrained by syntax and phonology (see also López 2009 for a similar view, but in a different and more elaborate syntactic approach). It is thus the syntax that allows for positions to be occupied by constituents which may or may not carry certain information structural roles. These roles are defined in the semantics or pragmatics, and are reflected in grammar in different ways. From all possible linearizations and all possible accent patterns of a sentence, the speaker chooses the one that best corresponds to the informational status of the sentence she utters. Some word orders are unmarked, and some are marked, in the sense that they are rarely chosen and that they differ from the canonical word order. The canonical word order is the one selected when the sentence is uttered in an all-new context. On the basis of their knowledge of grammatical linearizations, speakers choose a marked word order (or a marked accent pattern) in special contexts, depending on the needs of the information structure, among other factors influencing the choice of word orders. In other words, syntax proper delivers an array of linearizations which can be chosen by speakers depending on the context of utterance. In the remainder of this paper, I will speak of syntactic 'movement' of focused or given constituents relative to the unmarked word order of a sentence, although no theoretical claims are made about what is the best syntactic model to explain the deviations in word order. The main concern of the paper is to show that a focus prefers to be aligned with the edge of a prosodic constituent. Such an alignment may correspond to the canonical word order or deviate from it. Alignment is not compulsory, though, and higher constraints may render alignment impossible or less preferred. Higher constraints interfering with alignment may only be compatible with a rigid canonical word order. We will see examples of such interferences below.

Different strategies are used to fulfill focus alignment, and we will see several of them in detail below. First, in so-called scrambling languages, syntactic constituents may be arranged in different ways inside a single ι-phrase, and these languages may use this property to align focus with the edge of an ι-phrase. Hungarian is an example of such a language. Other languages, like French, Italian or Nɬeʔkepmxcin (Thompson River Salish, see Koch 2008a, 2008b), may have cleft constructions or right- and left-dislocations at their disposal in order to align a focus. These languages reorganize syntactic constituents in a more radical manner, sometimes creating two clauses, and thus two intonation phrases. A further option consists in changing the prosodic structure, so that a focus is aligned with the edge of a prosodic constituent, without changing the syntactic order. This happens, among others, in Japanese (Beckman and Pierrehumbert 1986), in Chicheŵa (Kanerva 1990) and in some Indian languages (see

Keane to appear for Tamil). This option involves insertion of a prosodic boundary, signaled by a special boundary tone or by lengthening of the penultimate syllable, like in many Bantu languages, or any other correlate of prosodic phrasing. Some strategies, found in still other languages, can be considered as alignment but need some adjustments to fit the theory. One case is the addition of a special morpheme, usually called a 'focus marker,' a widely used procedure in Chadic, Kwa and Gur languages, as well as in Cantonese among other languages. In this case, a special morpheme demarcates the beginning or end of a focus. Finally, further languages may choose to signal alignment indirectly in still another way. This happens with pitch accent in situ and postfocal deaccenting or compressing of pitch, which is largely present in languages with lexical stress, like English or German. In this case, it is not the segmental material which is aligned, but the metrical heads associated with focus (Büring 2010; Selkirk 2000; Truckenbrodt 1995). It is important to underline that focus alignment is always fulfilled by an operation existing independently in the language. Several grammatical reflexes that render focus special typically co-exist in individual languages. In other words, focus takes advantage of existing marked structure, be it prosodic, syntactic or morphological, to express the special status of one constituent in a sentence. And this marked structure often fulfills the goal of focus alignment.

The remainder of this paper is organized in the following way. Section 2 provides the theoretical background for the proposal. It starts with a short review of prosodic phrasing and information structural notions. A definition of alignment is also given in this section. In Sect. 3, an experiment is introduced, the results of which are used in the discussion of several languages. The experiment elicited semi-spontaneous utterances and is aimed at comparing the use of word order and prosody in different focus contexts. In Sects. 4 and 5, it will be shown how different realizations of focus can be unified under the notion of alignment. Section 6 concentrates on marginal cases of alignment, which need adjustment of the theory. Section 7 contains a discussion of the focus as alignment thesis advanced in this paper with a comparison with the focus as prominence thesis, and Sect. 8 contains a conclusion.

2 Background

2.1 Prosodic phrasing

A syntactic string is parsed into prosodic domains of different levels (Hayes 1989; Nespor and Vogel 1986; Selkirk 1984, 1986, 1995 and many others). I assume that there are only two categories above the prosodic word: ϕ-phrase (ϕ, prosodic phrase) and ι-phrase (ι, intonation phrase). Sentence (1) fulfills the 'Strict Layer Hypothesis' formulated by Selkirk (1984) and Nespor and Vogel (1986), because all segmental material is parsed in all prosodic categories, and all prosodic domains of level n are parsed exhaustively in prosodic domains of level $n + 1$. Only the prosodic levels from the prosodic word (ω, p-word) on are displayed here.

```
         (                    x      )      ι (ι-phrase)
         ( x      ) (         x      )      ɸ (ɸ-phrase)
         ( x      ) ( x      ) (x     )     ω (p-words)
(1)      Sara    bought lobsters
```

This view of a non-recursive prosodic structure makes wrong assumptions as soon
as the sentences have a syntactically embedded constituent structure, as in (2); see
Wagner (2005, 2010) and Kentner and Féry (2013). Such a sentence needs more than
only one layer of non-recursive ɸ-phrases.

(2)   (((Anna)ɸ ((and Bill)ɸ (and Claire)ɸ)ɸ (and Dennis)ɸ)ɸ (bought lobsters)ɸ)ι

   The solution adopted here is to allow systematic violation of the Strict Layer Hy-
pothesis. Prosodic words, ɸ-phrases and ι-phrases are then recursive categories, a
view largely represented in the newer literature on prosodic structure for different
languages (Ishihara 2003, 2007; Itô and Mester 2009, 2012; Selkirk 2009, 2011;
Wagner 2005, 2010; Féry 2011). The reader is referred to these works for motiva-
tion of recursion in prosody. Though not much material involving recursive prosodic
structure will be discussed in this article, it should be mentioned that the model of
prosody presented here allows recursion of the higher prosodic domains, from the
prosodic word on, to be precise. Embedded ɸ-phrases and embedded ι-phrases are in
fact very common.

2.2 Givenness, focus and topic

The notions of 'focus' and 'givenness' that are used here lean on the now standard se-
mantic approaches of Krifka (2008), Rooth (1992) and Schwarzschild (1999), which
assume that a focus elicits a set of alternatives, and that a given constituent is entailed
by the preceding discourse. 'Focus' is used rather traditionally as the part of the sen-
tence which introduces alternatives that are relevant for the interpretation of linguistic
expressions; see the definition of focus in (3), adapted from Krifka (2008). Besides
the normal semantic value present in each expression, a 'focus semantic value' is
a facultative additional value, understood as a set of alternatives, that is, a set of
propositions which potentially contrast with the ordinary semantic value. The ordi-
nary semantic value is always contained in this set; see Rooth (1985, 1992).

(3)   Focus
A focus is that part of a sentence which introduces alternatives that are relevant for
the interpretation of linguistic expressions.

   A given constituent is one which has already been introduced into the discourse
by a previous utterance or question, or which is somehow prominent in the common
ground (shared context). The notion of givenness has been assigned a formal sta-
tus by Schwarzschild (1999), who claims that a given constituent is entailed by the
preceding discourse. This use of givenness is restricted to text-givenness (previously
mentioned in the discourse), as opposed to context-givenness (contextually salient).
No distinction will be made in this paper between different kinds of givenness.

(4) Givenness
A given constituent is entailed by the preceding discourse.

Occasionally, a topic constituent will also play a role in the following discussion. Topic is understood here as an aboutness topic (see Jacobs 2001 and Reinhart 1981, among others). An 'aboutness topic' is a referent which the remainder of the sentence is about, possibly contrasting with other referents under discussion, and crucially followed by a focus constituent. The topic element has often been previously introduced into the discourse, but it does not necessarily have to be.

(5) Topic
A topic is a referential object on which the remainder of the sentence is making a proposition.

As will become clear in the discussion of the data in Sects. 5 to 8, a focus is not obligatorily expressed as such in grammar. When it is, it is expressed with a marked structure in the syntactic, prosodic or morphological components, or by a combination thereof. In the following, a distinction is made between different types of foci. A focus can be narrow or broad, thus differing in scope (see Gussenhoven 2008; Krifka 2008 and Ladd 1980), and it can also differ in strength (see Skopeteas and Fanselow 2010a for such a view in syntax). A sentence can be all-new, in which case it has no special information structural status. Syntax and prosody are then most likely unmarked. If a sentence does contain a focused part, the probability that this focus is expressed by a marked grammatical structure increases with the strength of the focus. The most important types of focus for this paper are *new focus*, which is just an information focus, elicited as the answer to a wh-question, and *corrective focus*, in which a constituent in a preceding sentence is replaced by another in the next sentence, the result of which is that the speaker asserts something which may contradict the expectations of the hearer; see Sect. 3 which introduces the experiment *Anima*. However, results from the literature are also used below, and since the literature is not always clear about which kind of focus is meant with notions like 'narrow focus' or 'contrastive focus,' clarification is needed.

A provisory scale of focus strength, including the categories all-new, new/narrow focus and corrective focus described above, as well as additional ones, is shown in (6). I propose that a broad informational focus is the weakest focus (cf. (6a), see É.Kiss 1998 and Gussenhoven 1983), followed by an informational narrow focus, for instance elicited by a wh-question, as in (6b); see again Gussenhoven (1983). If such a narrow focus has an exhaustive interpretation, it is slightly stronger, as in (6c); see É.Kiss (1998). Next, we find association-with-focus (Jackendoff 1972; Krifka 1999), which is a focus in the scope of a focus operator like *also* or *only*, as in (6d). Stronger kinds of focus are parallel foci, as in a comparison in which two or three elements are compared in an implicit or explicit way—for instance in a right-node-raising construction or in a selective focus, as in (6e); see Vallduví and Vilkuna (1998). And the strongest focus of this hierarchy is a corrective focus, illustrated in (6f); see Zimmermann (2008). The probability that a focus is realized with a marked syntactic or prosodic structure increases with the strength of the focus. However, as will become clear below, the probability that a focus will be realized with special grammatical devices decreases if the element to be focused already fulfills alignment

requirements in the unmarked grammar. If *Vienna* in (6) is the element in focus, it is often left unmarked in the grammar, as opposed to the subject *Tom* which is not in the sentence-final position, and which thus does not receive the unmarked nuclear stress by default. This asymmetry has been observed over and over in the literature, and is sometimes called subject/object asymmetry or subject/non-subject asymmetry (see for instance Fiedler et al. 2010).

(6)   a.   All-new sentence (broad information focus)
              {What is happening?}
              Tom is going to VIENNA.
       b.   Informational narrow focus
              {Who is going to Vienna?}
              TOM is going to Vienna.
       c.   Exhaustive/identificational interpretation of a narrow focus
              {Which of your sons is going to Vienna?}
              It is TOM who is going to Vienna.
       d.   Association-with-focus (particles):
              {Are both Alain and Tom going to Vienna?}
              Only TOM is going to Vienna.
       e.   Contrastive focus: parallelism, right-node-raising, selection
              {Where are your sons going to?}
              TOM is going to VIENNA, and ALAIN to BERLIN.
       f.   Contrastive focus: correction
              {Is Alain going to Vienna?}
              No, TOM is going to Vienna/No, it is TOM who is going to Vienna.

The data taken from the literature presented below have not always been checked for the kind of focus they illustrate. It is often the case that the sole distinction being made is between all-new (or broad focus) and narrow focus, where narrow focus occupies a place between informational and corrective focus. When the information is available, the kind of focus will always be clearly indicated.

2.3 Alignment

The idea of aligning syntactic and prosodic categories at their left or right edges in the formal approaches to prosody goes back to Chen (1987) and Selkirk (1986). In Selkirk's (1986) edge-account, a maximal projection is aligned with a prosodic phrase, and a sentence is aligned with an intonation phrase.[1] Itô and Mester (1994),

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[1]Selkirk (2009) uses Match constraints, which require that syntactic constituents be contained entirely in prosodic domains. These constraints predict that both edges of a syntactic domain are aligned with edges of the same prosodic domain. A further aspect of her proposal is that it allows recursion of prosodic domains: a syntactic XP entirely contained inside of a larger XP is matched with a ϕ-phrase entirely contained inside of a larger ϕ-phrase. Match constraints make different predictions from WRAP, a constraint from Truckenbrodt (1999). WRAP always requires that a syntactic constituent be contained in a single prosodic constituent. It does not demand that a smaller embedded syntactic constituent be contained in a prosodic constituent at the same time. Recursion of prosodic phrases corresponding to recursion of syntactic phrases is generally blocked because of the effect of NONRECURSIVITY, a constraint explicitly banning recursion

Selkirk ([2000](#)), Truckenbrodt ([1995](#)) and many others have used the tools introduced by McCarthy and Prince's Generalized Alignment (1993) in the framework of Optimality Theory (Prince and Smolensky [1993](#)) to express the intuitions of the edge-based account.

McCarthy and Prince's original definition of Generalized Alignment is given in ([7](#)).

(7)   Generalized Alignment (McCarthy and Prince [1993](#))
Where Cat_1 and Cat_2 are prosodic, morphological, or syntactic categories and $Edge_1$, $Edge_2 \in \{Right, Left\}$:

ALIGN (Cat_1, $Edge_1$; Cat_2, $Edge_2$) $\Leftrightarrow$
For each Cat_1, there is a Cat_2, such that $Edge_1$ of Cat_1 and $Edge_2$ of Cat_2 coincide.

This definition allows all kinds of categories to be aligned with each other, but here we are only concerned with the alignment of a focused constituent with a ɸ-phrase or an ι-phrase. To this effect, the family of constraints in ([8](#)) is subsumed under ALIGN-FOCUS. The constraints listed in ([8](#)) require a focus to be aligned with the left and right edges of a ɸ-phrase or an ι-phrase; see also Koch ([2008a](#), [2008b](#)) for a similar family of constraints.[2]

(8)   ALIGN-FOCUS

    a.   ALIGN-FOCUS R, ι-PHRASE R (ALIGN-FOC-ι-R):
        Align a focus with the right boundary of an intonation phrase.

    b.   ALIGN-FOCUS L, ι-PHRASE L (ALIGN-FOC-ι-L):
        Align a focus with the left boundary of an intonation phrase.

    c.   ALIGN-FOCUS R, ɸ-PHRASE R (ALIGN-FOC-ɸ-R):
        Align a focus with the right boundary of a prosodic phrase.

    d.   ALIGN-FOCUS L, ɸ-PHRASE L (ALIGN-FOC-ɸ-L):
        Align a focus with the left boundary of a prosodic phrase.

In the following, only the individual constraints will be illustrated, but the more general constraint ALIGN-FOCUS will be used in the discussion, or when it is not necessary to specify which of the four constraints is used. It is proposed that the four constraints are organized in two natural and universal markedness hierarchies, given in ([9](#)). In principle, all languages tend to align focus with the edge of an ι-phrase, but syntactic and prosodic constraints may block fulfillment in some cases. In such an eventuality, a focus may be content to be aligned with the edge of a ɸ-phrase. In other words, the rankings in (9) are irreversible: alignment with an ι-phrase is always higher ranking than alignment with a ɸ-phrase.

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of prosodic structure. Nevertheless recursion can be obtained if ALIGN is ranked higher than WRAP and WRAP is still active by being ranked lower than NONRECURSIVITY (see Truckenbrodt for Kimatuumbi). In Selkirk's approach (as in mine here), recursion is the default outcome, whereas in Truckenbrodt's WRAP approach, it is the marked case.

[2]McCarthy ([2003](#)) compares gradient alignment constraints with absolute/categorical ones, and shows that gradience can be eliminated from grammar. Following his proposal, all constraints used here are interpreted in an absolute way: if an element is not aligned, it is marked with one violation mark, regardless of the number of elements separating it from the edge.

(9)   Two markedness hierarchies
   a.   ALIGN-FOCUS R, ι-PHRASE R ≫ ALIGN-FOCUS R, ɸ-PHRASE R
   b.   ALIGN-FOCUS L, ι-PHRASE L ≫ ALIGN-FOCUS L, ɸ-PHRASE L

If the focus exponent is in the default nuclear position, its domain is often ambiguous (see Chomsky 1971; Selkirk 1995). It can signal a narrow focus, or a broader one. In the model proposed here, a language which uses pitch accent plus postnuclear deaccenting as a reflex of focus is accounted for in terms of alignment, albeit as a special case (see Sect. 6.1).

Sections 4 to 6 show how different languages fulfill the alignment constraints in (9). To this aim, observations from the literature and results of an experiment are used. Some of the materials used to illustrate the paper's claims are taken from an experiment conducted in Potsdam between 2005 and 2009. This experiment is introduced briefly in the next section, before turning to the discussion of the data and their analysis.

3 Experiment: *Anima*

The experiment reported on here was conducted by means of *Anima*, one of the tasks of QUIS (Questionnaire for Information Structure, Skopeteas et al. 2006). This questionnaire elicits semi-spontaneous spoken material from four informants per language on the basis of different tasks using visual material.

In the task *Anima*, transitive sentences were elicited by means of the following procedure. Four pictures depicting simple actions involving an agent and a patient were presented to the informants; see the example in Fig. 1.

The task was presented as a memorization task. The informants observed the stimuli and memorized the details of the figures and events. After a few seconds, the stimuli were taken away. The informants then replied to four questions relating to the stimuli. They were instructed to give full answers, which were recorded on a DAT recorder. Two conditions were varied in the stimuli. First, the focused constituent asked for: agent or patient. The agent was always human, but the patient was human in half of the cases, and inanimate in the other half. Second, the focus type: new information focus or corrective focus.[3] The questions used in this paper bearing on the last picture of Fig. 1 are listed in (10).

(10)   Stimulus:
         Picture of a man pushing a car in front of a well
       Conditions:
         New Agent: 'In front of the well, <u>who</u> is pushing the car?'
         New Patient: 'In front of the well, <u>what</u> is the man pushing?'
         Correction of Agent: 'In front of the well, is a <u>woman</u> pushing a car?'
         Correction of Patient: 'In front of the well, is the man pushing a <u>bicycle</u>?'

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[3] Two further conditions (selection and confirmation) were also recorded but are not considered here.

Fig. 1 Sheet 1 of *Anima*: woman hitting man, girl hitting boy, man kicking chair, man pushing car

In this way, small datasets were obtained from four native speakers per language, with maximally 16 items per condition.[4] Asymmetries of the focus constituent and of the focus type, like word order and prosodic properties, could be systematically studied and compared across languages. In most cases, the agent was referred to as the subject of the sentence and the patient as the object. When talking about word order, the established terminology SVO or SOV will be used. When not specified otherwise, the agent is then the subject, and the patient is the object.

The results of *Anima* are reported for the languages mentioned below when available. For the other languages, materials from the literature are discussed and, for Georgian, results from another experiment are used.

4 Focus alignment with an ι-phrase

4.1 Alignment with the right of an ι-phrase: Italian and French

4.1.1 Italian

Italian aligns focus with the right edge of an ι-phrase. Following Truckenbrodt's (1995) proposal, Samek-Lodovici (2005) proposes that a focused constituent is located at the right edge of an intonation phrase as a consequence of a constraint

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[4]Altogether, 18 languages have been tested with *Anima*. The experimenter was in most cases a native speaker who is trained as a linguist. The languages not addressed in this paper are Greek, Yucatec Maya, Mawng, Quebec French, American English, Mandarin Chinese, Dutch, Prinmi, Arabic, North Sotho, and Aja. The data are available online (http://www.sfb632.uni-potsdam.de/~d1/annis/).

STRESS-FOCUS. According to him, alignment is a by-product of fulfillment of this constraint. Since stress is assigned at the right edge of an ɩ-phrase, a focus is aligned in order to have stress fall on the focus. Canonical word order in Italian is SVO with final nuclear accent, as shown in (11a). If the subject is narrowly focused, and the remainder of the sentence is given, as in (11b), the subject *Gianni* is in the postverbal position. If *Gianni* is preverbal and the entire sentence is included in one ɩ-phrase, as in (11c), the sentence is infelicitous as an answer to the question *Who has laughed?*

(11)   a.   {What happened?}
            (Gianni ha RISO$_F$)$_ɩ$
            'John has laughed.'

       b.   {Who has laughed?}
            (Ha riso GIANNI$_F$)$_ɩ$
            'John has laughed.'

       c.   {Who has laughed?}
            $^{??}$[(GIANNI$_F$ ha riso)$_ɩ$
            'John has laughed.'

In (12a), from Samek-Lodovici (2005:703), the focused constituent *a Roma* 'to Rome' is also aligned to the right edge of the sentence, and thus with the right edge of the ɩ-phrase comprising the whole sentence. Again, the sentence consists of a single ɩ-phrase. In (12b), there is a non-focused constituent after the focused one in the same sentence, but this constituent is right-dislocated and separated from the main ɩ-phrase both intonationally and syntactically. I refer the reader to Samek-Lodovici (2005) for discussion.[5] Samek-Lodovici does not propose a prosodic phrasing for extraposed constituents. I suggest treating them as extra-sentential (ES) elements, as proposed by Gussenhoven (2004:291) for English. In this typology, the extraposed constituent in (12b) is encliticized to the main ɩ-phrase because it is set off from the main clause by a boundary.

(12)   {Where did you go with Mario?}
       a.   ((Sono andato con Mario)$_\phi$ (a ROMA$_F$)$_\phi$)$_ɩ$
              am   gone with Mario   to Rome
            'I went to Rome with Mario.'
       b.   ((Sono andato a ROMA$_F$)$_ɩ$ (con Mario)$_\phi$)$_ɩ$
              am   gone   to Rome   with Mario
            'I went to Rome, with Mario.'

There are however cases where the focus cannot be perfectly aligned for syntactic reasons. This is illustrated in (13) with a numeral. The example comes from Samek-Lodovici (2005:704), but see also Frascarelli (2000:38). In (13), the noun *ciliege*

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[5]"Right dislocated phrases are easily recognized because they can be doubled by a clitic, may freely follow locative and temporal adjuncts, are always preceded by an intonational break, and can be preceded by an optional pause (here represented by a comma). Crucially, focus must always precede right dislocated constituents" (Samek-Lodovici 2005:703).

'cherries' must follow the focused numeral: (13b) is not a possible sentence in Italian because numeral and head noun must remain together. As a result, the focus is not perfectly aligned to the right.

(13)   {How many cherries have you given to Mary?}

      a.   ((Ho   dato a Maria)$_\phi$ (TRE$_F$ ciliege)$_\phi$)$_\iota$
          have.1sg given to Mary   three cherries
          'I have given three cherries to Mary'
      b. *Ho   dato a Maria ciliege TRE$_F$
          have.1sg given to Mary cherries three

From here on, Optimality Theory will be used for the presentation of theoretical claims because it suits well the aims of this paper. In an optimality-theoretic formulation of syntax (see Grimshaw 1997; Samek-Lodovici 2005 and many others), prosodic alignment may be a trigger for syntactic movement. Previous work has shown that the effect of prosody on word order can be integrated with syntactic demands in this framework. In particular, symmetric interactions between syntax and prosody can be expressed by ranking the appropriate constraints. In the case at hand, the goal of aligning a focus is expressed in terms of the optimality-theoretic constraints in (8), and violation of these constraints is accounted for by higher-ranking constraints discussed below. Conversely, fulfillment of alignment constraints often results in violation of lower-ranked constraints militating against movement or against insertion of prosodic boundaries, etc. The constraints blocking alignment can be syntactic, prosodic or morphological. The ranking of these constraints decides in favor of or against fulfillment of alignment.

In Samek-Lodovici's optimality-theoretic analysis of Italian, it is not the focus itself which is aligned. Instead, the analysis proceeds in two steps. First, the focus has to be prominent under the effect of STRESS-FOCUS (2005:697, adapted from Truckenbrodt 1995:10), a constraint which requires that focus be realized with the highest pitch accent (or prominence for Truckenbrodt) of its domain. Second, the movement of the focused constituent to the right is induced by the need to locate the nuclear accent to the right of an ι-phrase. This is done with the help of high-ranking HEAD-ι-R, formulated in (14a), adapted from Truckenbrodt (1995:11). Samek-Lodovici's analysis is thus inspired by Truckenbrodt's FP model (1995), where it is proposed that the primary correlate of focus is prominence, and that alignment is just a means to obtain it. For this reason, no constraint directly requires a focus to be aligned with the right edge of an ι-phrase, although the combination of constraints and their ranking triggers this effect.

In the FA model proposed here, focus is directly aligned with the right edge of an ϕ-phrase. This is achieved by ALIGN-FOC-ι-R in (8a), a categorical constraint that requires the focus constituent to be aligned with the right boundary of an ϕ-phrase. This constraint ranks higher than CANONICALWORDORDER, formulated in (14b). This constraint militates against any deviation from the canonical word order of constituents, thus against all marked syntactic structures, and is comparable to STAY from Grimshaw (1997). I assume that, at least in the short sentences considered in this paper, sentences preferably emerge in their canonical word order, which is the

word order of an all-new sentence. In Italian, it is SVO. Thus in T1, the tableau illustrating my proposal, ALIGN-FOC-ι-R directly addresses focus. It is through its effect that focus is located to the right of the ι-phrase. The fact that nuclear stress is rightward is a general fact in Italian, and it is expressed by HEAD-ι-R. In other words, ALIGN is special for focus, but HEAD-ι-R is not. In Italian, both accent and focus are independently aligned with the right edge of the intonational phrase, thus an additional constraint requiring prominence for focus is not needed. As shown by Swerts et al. (2002) and also by Ladd (2008), Italian does not deaccent given material in the same way as German, Dutch and English (see below for deaccenting in German).[6] So deaccenting in Italian may not be an available option (see Footnote 8 for French, which may hold for Italian as well). By locating the focus to the right, postnuclear deaccenting is trivially fulfilled.

(14)   a.   HEAD-ι-R (H-ι-R): Align the right boundary of every intonation phrase
              with its head.
        b.   CANONICALWORDORDER (CWO): Realize the canonical word order.

T1 *Gianni ha riso* (Focus = Gianni)	ALIGN-FOC-ι-R	H-ι-R	CWO
a. ☞ (Ha riso GIANNI$_F$)$_ι$			*
b. (GIANNI$_F$ ha riso)$_ι$	*!	*	
c. (Gianni$_F$ ha RISO)$_ι$	*!		

Both Samek-Lodovici's analysis and mine are equivalent in their predictions. The sole difference is that in Samek-Lodovici's account, assigning a default nuclear accent and assigning a stress because of focus are dissociated. Each needs its own constraint (HEAD-ι-R and STRESS-FOCUS). In my account, stress is always final and always due to HEAD-ι-R, and focus is moved to this final position under the effect of ALIGN-FOC-ι-R. My account predicts no extra stress because of focus; there should not be an extra prominence due to focus, at least not if focus is an informational focus, as it is in the context of (11b). If it is contrastive or corrective, it may be expressed with extra stress.

4.1.2 French

French also aligns a narrowly focused constituent with the right edge of an ι-phrase. However French differs from Italian in two important respects. First, French has no lexical stress and thus no obligatory association of a pitch accent with a designated syllable. This implies that the final tonal excursion has no invariant place in a word. For this reason, it is more appropriate to analyze it as a correlate of phrasing, perhaps even as a boundary tone (see Féry et al. 2010 for demonstration). The result is that HEAD-ι-R is not active in this language. In short, there is no reference to prominence, neither for focus nor for nuclear stress, at least for the sentences examined here (although it is not excluded that in some cases, French does use pitch accents for expressing prominence).

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[6]Swerts et al. (2002) demonstrate experimentally that no deaccenting takes place in the nominal phrase in Italian; see also Ladd (2008) for the lack of deaccenting in Italian.

Table 1 Word order in the experiment *Anima* for French

	SVO	Cleft	Passive
Agent new ($n = 7$)	2	4	1
Agent correction ($n = 7$)	–	7	–
Patient new ($n = 7$)	7	–	–
Patient correction ($n = 8$)	8	–	–

Second, alignment of a subject with an ι-phrase cannot be achieved with a simple word reordering, as was illustrated for Italian. This option is barred in the syntax: in French, a subject is obligatorily preverbal, with the exception of very marked constructions like stylistic inversion which are not found in Francilian French, the colloquial spoken language in the Parisian region, illustrated below. Instead, French predominantly uses clefts for subject focus, which is a way of aligning the focus with the right edge of an ι-phrase (see Hamlaoui 2009a, 2009b for cleft as alignment). It will be shown below that CWO is not sufficient to explain the French data, because some of the optimal candidates violate CWO.

But first compare the results of *Anima* for Parisian French in Table 1. When the patient was narrowly focused, the word order was always canonical (SVO), but in the case of agent focus, an identificational cleft was obtained in 11 of 14 cases; see the example in (15a). One speaker realized a passive sentence, another way of aligning the agent with the right edge of the ι-phrase; see (15b). The reason for assuming an ι-phrase boundary to the right of the cleft is twofold. First there is a syntactic component: the cleft sentence is a matrix clause embedding a subordinate clause, and there is a clausal boundary at this place, corresponding to a potential prosodic boundary. Second, in this kind of sentence, there is often a break or longer duration between the cleft part and the remainder of the sentence, following a low boundary tone at the end the cleft part, and followed by the second part of the sentence which remains low. See Clesh-Darbon and Rialland (1999), who show that the cleft sentence corresponds to an ι-phrase and who interpret the second part of the sentence as an intonational copy of the first part's boundary tones.[7] The whole sentence also forms an ι-phrase which includes both smaller ι-phrases, thus a recursive structure, as shown in (15a). Like in Italian, an object is perfectly aligned from the start, at least when it is final in its sentence, and accordingly there is no change in the word order when an object is focused; see (15c) for an example. In this case, the object is not realized by any prominence. The last word is uttered rather low, realized at the bottom line of the speaker's voice, soft and even slightly creaky. Table 1 shows that patient focus is always realized with the canonical word order SVO in the experimental data.

(15) a.   Agent correction (cleft-sentence)
            {{...} does a woman push the car?}
              Non, ((c'est un homme$_F$)$_\iota$ (qui pousse la voiture)$_\iota$)$_\iota$
                no it-is a   man   who pushes the car
            'No, a man pushes the car.'

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[7]Cleft sentences do not always have this prosodic form in French. They can also be eventive sentences and be realized in one ι-phrase. These latter sentences differ from the one shown in (15a).

b. Agent new (passive construction)
    {Who pushes the man?}
    ((L'homme blanc)$_\phi$ (est poussé par [l'homme noir]$_F$)$_\phi$)$_\iota$
      the-man white   is pushed by the-man black
    'The white man is pushed by the black man.'

c. Patient new (SVO$_F$)
    {What does the man carry?}
    ((L'homme)$_\phi$ (porte   une femme$_F$)$_\phi$)$_\iota$
      the-man   carries a   woman
    'The man carries a woman.'

Hamlaoui ([2009a](#), [2009b](#)) analyzes Francilian French in the same way as proposed by Samek-Lodovici ([2005](#)) for Italian in requiring prominence for focus and in aligning the accent with the right edge of an ι-phrase. She proposes that a cleft construction is the best way to fulfill these requirements in French, given that syntax does not allow movement of a subject to the right. This effect is achieved by the constraint SUBJECT from Hamlaoui ([2009a](#), [2009b](#)), reproduced in (16), which requires that subjects be obligatorily realized, and that they appear in the sentence-initial position.

(16)   SUBJECT: Sentences have overt subjects in SpecIP.

In T2 and T3, illustrating the FA model proposed here, it is shown that in French, as in Italian, ALIGN-FOCUS-ι-R is high ranking. But in French, SUBJECT is also high ranking.[8] Ultimately, SUBJECT is higher ranking than ALIGN-FOCUS-ι-R, because French always needs overt subjects in SpecIP, but focus is not always perfectly aligned. For this reason, SUBJECT is higher ranked than ALIGN-FOCUS-ι-R in Tableau 2, although the data presented here do not show this ranking. Notice that the subject of the relative clause in (15a) is *qui*, a relative pronoun. T2 illustrates focus on the agent, realized as a subject. CWO is a constraint against syntactic reordering relative to the canonical word order in general, which explains why it is violated by candidate a, the cleft sentence realized by the informant. This violation does not eliminate the optimal candidate a., since the decision is made by the higher-ranking constraints SUBJECT and ALIGN-FOCUS-ι-R, which eliminate the other two candidates.[9] Candidate b. with an aligned focus is eliminated by SUBJECT, because the subject is not in SpecIP. This shows the power of syntax to block a better prosody.

T2 *Un homme pousse la voiture* (Foc = un homme)	SUBJECT	ALIGN-FOC-ι-R	CWO
a.☞((C'est un homme$_F$)$_\iota$ (qui pousse la voiture)$_\iota$)$_\iota$			*
b. ((Pousse la voiture)$_\Phi$ (un homme$_F$)$_\phi$)$_\iota$	*!		*
c. ((Un homme$_F$)$_\Phi$ (pousse la voiture)$_\Phi$)$_\iota$		*!	

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[8]The constraint SUBJECT is low ranking in Italian, and adding it below HEAD-ι-R does not modify the tableau T1.

[9]The notions of syntactic inputs and syntactic candidates in OT are far from being resolved issues. Here I follow Hamlaoui ([2009a](#), [2009b](#)) in assuming that the input is best understood as a predication without numeration and without linearization. In this way, cleft sentences are allowed in the set of candidates.

T3 illustrates (15c) with new patient focus. The canonical word order SVO is perfect in this sentence since the object (the patient) is aligned by default with the right edge of the ι-phrase corresponding to the sentence.

Notice that prominence is not even mentioned in the analysis for French. This is a welcome result, since the issue of the presence of pitch accents as conventional accents is not resolved for this language.

T3 *l'homme porte une femme* (Foc = une femme)	SUBJECT	ALIGN- FOC-ι-R	CWO
a. ((C'est l'homme)ι (qui porte une femme_F)ι)ι			*!
b. ((C'est une femme_F)ι (que porte l'homme)ι)ι			*!
c. ☞(L'homme porte une femme_F)ι			

In a French sentence with two objects like in (17), the focused argument is prefer-ably final, like in (17a–b). In (17b), the given argument is pronominalized. Like in Italian, it is not impossible to find a given argument after a focused one, but then the given argument is preferably dislocated, and there is an optional resumptive pro-noun in the main ι-phrase. This is illustrated in (17c) with and (17d) without a re-sumptive pronoun. In (17d), the extraposed indirect object may be understood as an afterthought, whereas in (17c), it is an antitopic, or a tail in Vallduví's (1992) termi-nology, see also De Cat (2007) and Beyssade et al. (2009). In Féry (to appear), it is shown that post-focal compression is possible in French. However, and in contrast to the Germanic languages, post-focal compression is only possible at the level of a prosodic phrase (φ-phrase), and not at the level of a prosodic word, which can explain why French prefers to insert the given material in separate phrases.

(17)   a.   {To whom does Mary give a cake?}
                ((Marie)_φ (donne un gâteau)_φ (à son frère_F)_φ)ι
                  Mary   gives   a   cake   to her brother
                'Mary gives a cake to her brother.'
        b.   {What does Mary give to her brother?}
                ((Marie)_φ (lui   donne un gâteau_F)_φ)ι
                  Mary   him.DAT gives a   cake
                'Mary gives him a cake.'
        c.   (((Marie)_φ (lui donne un gâteau_F)_φ)ι, (à son frère)_φ)ι
        d.   (((Marie)_φ (donne un gâteau_F)_φ)ι, (à son frère)_φ)ι

Finally consider the French equivalent to the Italian (13). Here the focused nu-meral can be final in its ι-phrase. The nominal *cerises* 'cherries' is right-dislocated and expressed in the main ι-phrase with the help of *en* 'of-them,' a resumptive pre-verbal pronoun; likewise, *Marie* is replaced by *lui* 'her.DAT.' Both are separated by an ι-phrase boundary, and each extraposed argument is phrased in a separate φ-phrase.

(18)   {How many cherries have you given to Mary?}
            (((Je lui   en   ai   donné trois_F)_φ)ι, (de cerises)_φ (à Marie)_φ)ι
              I   her.DAT of-them have given three,   of cherries, to Mary
            'I gave Mary three_F cherries.'

In sum, we have seen two ways to align a focus with the right edge of an ι-phrase: in Italian through scrambling of φ-phrases inside of an ι-phrase, and in French through the addition of a new ι-phrase.[10] It should be noticed that prominence falls together with alignment in Italian but not in French. As a result, Samek-Lodovici's analysis and the account proposed here are equivalent for Italian. But this is not true for French. Here the absence of pitch accent does not allow alignment to be to identified with prominence.

4.2 Alignment with the left edge of an ι-phrase: Hungarian and Nɬeʔkepmxcin

4.2.1 Hungarian

Hungarian is, to my knowledge, the only language where a focused constituent is straightforwardly aligned with the left edge of an ι-phrase. According to Bródy (1990), É.Kiss (1998), Szendrői (2003), among others, Hungarian has free word order, depending on information structure. In (19a) from Szendrői (2003:64), canonical word order (VSO) is used in the VP. The temporal adverb *tegnap este* 'yesterday evening' is a topic and is external to the main ι-phrase. According to Szendrői, it receives phrasal stress but not main stress. The verb is initial in the main ι-phrase of the sentence, and has the main falling tone pattern of the sentence. All words in Hungarian have initial lexical stress. Since the tonal fall is realized on the first syllable at the level of the word, it is the first syllable of the ι-phrase which is accompanied by a tonal fall, often analyzed as a pitch accent in the literature. This initial tonal fall stands for the main stress at the level of the sentence (see for instance Szendrői 2003; É.Kiss 1987 and Hunyadi 2002:88ff for this view).[11] In (19b), *Marinak* is a narrow focus and is located in the initial position of the main φ-phrase, which is the

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[10]A similar construction to the cleft formation resulting in focus alignment to the right of an φ-phrase illustrated for French is the so-called Predicate Cleft, which involves copying and fronting of a predicate. It is found in Trinidad dialectal English (Cozier 2006), where Predicate Cleft expresses contrastive or verum focus on the verb.

(i)   Is WALK (that) Tim did *walk*.
        'Tim [walked]$_F$ (as opposed to running, skipping, etc.).'
        'Tim really did walk.'

In Haitian Creole (Piou 1982), a focused predicate is also copied and fronted; see (ii).

(ii)   Se malad tifi a malad.
        it's sick baby DET sick
        'The baby is [sick]$_F$.'

In the case of the so-called Predicate Doubling illustrated in (iii) with Gungbe (Kwa; see Aboh 2004), the focus marker wὲ is to the right of the preposed verb (see below for similar examples).

(iii)   [du] wὲ Sэ́na [du] blэ́di
        eat FM Sena eat bread
        'Sena [ate]$_F$ the bread.'

[11]Varga (2002:127ff and 138ff) claims that all constituents have major stress in an all-new sentence, like (19a). According to him, only the preverbal focus has main stress (major stress), as in (19b); see also Vogel and Kenesei (1987:245) for this position.

preverbal position. In other words, the narrow focus is located at the left edge of its ι-phrase, which is the preverbal position, and it carries the main accent of the sentence on its initial syllable. A preverbal focus is accompanied by a postverbal position of the verbal particle. In (19a), the particle *be* in *be-mutattam* 'introduced' is preverbal, and in (19b) it is postverbal as a result of the preverbal focused *Marinak* (for analyses of the change of position of the verbal particle, see É.Kiss 1998; Szendrői 2003 and many others).

(19) a. {What did you do yesterday evening?}
        ((Tegnap este)$_\phi$ ([BE-MUTATTAM Pétert Marinak]$_F$)$_\phi$)$_\iota$
        yesterday evening PRT-introduced-I Peter-ACC Mary-DAT
        'Yesterday evening, [I introduced Peter to Mary]$_F$.'
      b. {To whom did you introduce Peter yesterday evening?}
        ((Tegnap este)$_\phi$ ([MARINAK]$_F$ mutattam be Pétert)$_\phi$)$_\iota$
        yesterday evening Mary-DAT introduced-I PRT Peter-ACC
        'Yesterday evening, I introduced Peter [to Mary]$_F$.'

There is a controversy in the literature as to the best analysis of the preverbal focus position. According to Bródy (1990) and Horváth (2007), it is a syntactic position (a Focus Phrase in the cartographic analysis). Szabolcsi (1981, 1994) and É.Kiss (1998) claim that the position arises at the syntax-semantics interface (due to an exhaustive reading of the focus), and Szendrői (2003) considers it the result of prosody-syntax interaction (focus is located at the left edge of an ι-phrase). Some authors emphasize the fact that this position may be preceded by quantifier phrases (see for instance Horváth 2007 and É.Kiss 2010). However, it looks as if the quantifier phrases are external to the main ι-phrase. While there is always a single focus in the preverbal position, multiple topics and quantifiers in that order are possible. Compare the following examples from Balogh (2009:131), where subscripted T stands for 'topic' and subscripted Q for 'quantifier'.

(20) a. Amy$_T$ mindenkit$_Q$ Benhez$_F$ küldött.
        Amy everyone.ACC Ben.ALLATIVE sent
        'Amy sent everyone to BEN.'
      b. Bent$_T$ Amy$_T$ mindig$_Q$ mindenkinek$_Q$ titokban$_F$ mutatta be.
        Ben.ACC Amy always everyone.DAT secretly introduced
        'Amy always SECRETLY introduced Ben to everyone.'

Semantics, syntax and prosody conspire to place a narrow focus in the ι-phrase initial position, especially when its strength is high on the focus hierarchy proposed in (6). É.Kiss (1998) and Horváth (1986, 2007) show that this preverbal focus is at least interpreted with an exhaustive reading, though Szendrői proposes that weaker focus types are located in this position as well, a claim confirmed by the experimental data from *Anima* shown below. The conspiracy of different grammatical properties is accounted for in my proposal by optimality-theoretic constraints addressing focus, a semantic entity, and syntax-based prosodic edges in a single constraint. The syntax provides a unique focus position in Hungarian. When there are several foci in a sentence, only one, the strongest one, is preverbal and the others are postverbal. The ι-phrase-initial position is not special for focus, since it is occupied by the verb in

Table 2 Word order in the experiment *Anima* for Hungarian

	SVO	SOV	OVS
Agent new ($n = 8$)	8	–	–
Agent correction ($n = 8$)	8	–	–
Patient new ($n = 8$)	–	4	4
Patient correction ($n = 7$)	–	6	1

broad focus or when the verb is narrowly focused. In both cases, the verb often has the falling tone associated with this position. Moreover the falling tonal contour (or pitch accent associated with the initial position of the main ι-phrase) is also not special for focus but is a characteristic of Hungarian intonation. What is special is that the focus is moved to this position, which is in my analysis a case of alignment with the left edge of the ι-phrase. As already suggested for Italian, there is a functionally motivated association of this position with prominence, as it corresponds to the highest tonal event in the sentence, and thus the most prominent position. In other words, it is again not an accident that alignment and prominence fall together. Nevertheless, because alignment is found universally also in cases where it is not associated with prominence, as demonstrated for French and below for further languages, I propose that alignment is the primary prosodic property of focus, and that prominence is a side-effect of the prosodic characteristics of Hungarian.

The results of the *Anima* experiment for Hungarian in Table 2 were unambiguous. Not a single exception to the left-alignment generalization could be found. The focused constituent was immediately preverbal in all cases. In SVO (agent focus) and OVS (patient focus) configurations, the initial constituent carried the typical falling tone starting the main ι-phrase, and the remainder of the sentence was rather flat and low. In the OVS word order, there was no topic and the subject was post-verbal, the typical position for given constituents. In SOV, which was used exclusively in the patient focus configurations, the subject corresponded to the topic intonation, and had a typical rising tone. It was separated from the rest of the sentence by an ι-phrase boundary, i.e. longer duration, optional break and pitch reset at the following ι-phrase. The object started the main ι-phrase and had the falling tone described above. Recall that the canonical word order is VSO in Hungarian. This configuration was not used in the results of *Anima*, since all sentences contained a narrow focus either on the subject or on the object.

An example of agent correction appears in (21a), and one of patient correction in (21b). Notice the postverbal location of the verb particles *meg* and *fel*, showing that the preverbal constituent is the narrow focus.

(21) a. Agent correction ($S_F VO$)
          {[…] does a man hit the man?}
          Nem, (egy NŐ$_F$ üti meg a   férfit)$_\iota$
          no   a   woman hits PRT the man-ACC
          'No, a woman is hitting the man.'
      b. Patient correction ($O_F VS$)
          {[…] did the man kick a table?}

Nem, (egy SZEKET$_F$ rúgott fel a férfi)$_\iota$
no, a chair kicked PRT the man
'No, the man kicked a chair.'

A similar analysis to the one proposed for Italian appears in T4 for (21b), which uses the constraint ALIGN-FOC-ι-L and HEAD-ι-L in (22). The direction of alignment is now to the left of the ɸ-phrase, as is the position of the main accent. There is no evidence for a ranking between ALIGN-FOC-ι-L and HEAD-ι-L, but there is for CANONICALWORDORDER, which penalizes all deviations from the canonical word order. CWO is not fulfilled by the optimal candidate, and is consequently rather low ranking. The ranking is best justified by the competition between a., the optimal candidate, and e., the one preserving the canonical word order.[12] This candidate violates ALIGN-FOC-ι-L and is eliminated from the competition.

(22)   HEAD-ι-L: Align the left boundary of every intonational phrase with its head.

T4 *felrúgott a férfi egy szeket* (Foc = egy szeket)	ALIGN-FOC-ι-L	HEAD-ι-L	CWO
a. ☞ (EGY SZEKET$_F$ rúgott fel a férfi)$_\iota$			*
b. (egy szeket$_F$ RÚGOTT FEL a férfi)$_\iota$		*!	*
c. (a férfi felrúgott EGY SZEKET$_F$)$_\iota$	*!	*!	*
d. (FELRÚGOTTa férfi egy szeket$_F$)$_\iota$	*!		
e. (FELRÚGOTT egy szeket$_F$ a férfi)$_\iota$	*!		*

Szendrői (2003) proposes an analysis along the lines of Reinhart's (1995) *Stress-focus correspondence principle*, which posits that a focus is always accompanied by stress. Like Samek-Lodovici for Italian, she thus claims that a focus is aligned at the left boundary of the ɸ-phrase to fulfill the needs of stress. My proposal differs in that the two requirements, focus alignment and accent alignment, are distinct and are addressed by different constraints. The reason is the same as before: focus alignment is found in all languages, whereas the requirement that focus be expressed by accent is not. It is thus necessary to separate alignment and prominence.

4.2.2 Nɬeʔkepmxcin

Koch (2008a, 2008b) shows that in Nɬeʔkepmxcin (Thompson River Salish) all foci are aligned to the left of an ι-phrase. He advocates a similar proposal to the one presented in this paper for Nɬeʔkepmxcin, but not for English, for which he proposes a prominence version of alignment. In this latter language, according to Koch, focus is always associated with a prosodic head.

In Nɬeʔkepmxcin, focus is realized by two types of clefts: 'bare' or 'introduced' (terminology from Kroeber 1997). A bare cleft consists of a bare noun or adjective which acts both as the matrix predicate and as the focus (the cleft head), and which

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[12]The constraint ALIGN-FOC-ι-R is not eliminated from the competition, but it is now low ranking. Its effect cannot be felt anymore, as it is dominated by ALIGN-FOC-ι-L.

takes the residue clause as its subject; see (23), from Koch (2008b:251). An introduced cleft is characterized by a cleft predicate *çe* or *ʔe* which introduces the focused DP (the head of the cleft), plus a cleft clause or 'residue clause'; see the example in (24), from Koch (2008b:251). The residue clause is introduced by a complementizer and carries subordinating morphology. According to Kroeber (1997) and to Koch (2008a, 2008b), the focused cleft heads are base generated, and not moved to the left edge.

Nɬeʔkepmxcin is especially interesting because of the dissociation of the expression of focus, which is mostly realized as a cleft sentence, and the location of nuclear stress, which is always on the rightmost lexical item, regardless of the information structural properties of the sentence. It can be considered a language which aligns its focus at the opposite edge of the prominence, as predicted to be possible in the FA model.

(23)   (x   ) (   ) (x   )   ι-phrase
          (x   ) (x   ) (x   )   φ-phrase
          Téʔe. [qʷúʔ]_F λʼuʔ e   s-ʔúʷeʔ-kt
          NEG. water   just DET NOM-drink-1PL.POSS
          'No. We'll just drink [water]_F.'
          (more literally: 'No, the thing that we will drink is just water.')

(24)   (x   ) (   ) (x   )   ι-phrase
          (x   ) (x   ) (x   )   φ-phrase
          Téʔe. ćé   [ɬ Róss]_F   e   pínt-ə-t-ø-mus
          NEG. CLEFT DET Ross   DET paint-DRV-TR-3O-SUBJ.EXTR
          'No. It was [Ross]_F who painted it.'

As acknowledged by Koch, alignment is not straightforward; rather, it is mediated by the formation of a syntactic phrase and a corresponding φ-phrase. It is this φ-phrase which is aligned to the left boundary of an ι-phrase. Only the bare cleft can be considered to be a true case of left alignment. In an introduced cleft, however, a focus can be separated from the beginning of the ι-phrase by several constituents.

5 Focus alignment with a φ-phrase

Some languages align their foci with the right or left edge of a φ-phrase. As proposed above, all languages rank the constraints requiring alignment of focus with an ι-phrase higher than those requiring alignment with a φ-phrase, because these constraints are organized in an irreversible markedness hierarchy. However, the languages discussed in this section cannot fulfill focus alignment with an ι-phrase on a regular basis because higher-ranked constraints that limit word reordering interfere.

5.1 Right-alignment with a φ-phrase: Chicheŵa, Northern Biskayan Basque and Konkani

We start with languages aligning focus with the right edge, and show that very different languages choose this option.

5.1.1 Chicheŵa

The first example of a language which requires that a focus be right-aligned with a
ɸ-phrase is Chicheŵa, a Bantu language which was first described along these lines
by Kanerva (1990). Some of Kanerva's examples are given in (25). The example in
(25a) is an all-new sentence. The sentence is in its canonical order (V O PP) and
is pronounced in a single ɸ-phrase, corresponding to the ɸ-phrase. In (25b), an in-
stance of object focus, the word order is not changed, but the prosodic structure is.
In this case, a ɸ-phrase boundary is inserted to the right of the focused constituent,
after the object. According to Kanerva (1990), Downing et al. (2004) and Downing
and Pompino-Marschall (2013), a prosodic boundary is easily identifiable because it
triggers penult lengthening, i.e. the penult syllable of a ɸ-phrase is lengthened. (High
tone is written with an acute accent ´ in the following, and low tone is not indicated.)
In (25c), focus is on the verb, and when word order remains canonical, a prosodic
boundary is inserted after the verb. In this case, the object is again separated from
the PP with a prosodic boundary. In (25b–c) the postfocal ɸ-phrases are given, but
they are phrased independently, and thus trigger lengthening of the penult syllable.
According to Downing et al. (2004), the main phonetic correlate of focus is relative
prominence rather than culminativity: downdrift, understood as a decrease in pitch
from one ɸ-phrase to the next, is less than expected if the second phrase is focused
although this view is revised in Downing and Pompino-Marschall (2013), see be-
low.

(25)   Chicheŵa (Bantu)

    a.   {What happened?/What did he do?}
        (([anaményá nyumbá ndí   mwáála]$_F$)$_\phi$)$_\iota$
        he-hit   house   with rock
        'He hit the house with a rock.'

    b.   {What did he hit with the rock?}
        ((anaményá [nyuúmba]$_F$)$_\phi$ (ndí mwáála)$_\phi$)$_\iota$

    c.   {What did he do to the house with the rock?}
        (([anaméenya]$_F$)$_\phi$ (nyuúmba)$_\phi$ (ndí mwáála)$_\phi$)$_\iota$

Compare (25) with (26) from López (2009), which illustrates the same phe-
nomenon in Spanish, except that Spanish has clitic doubling (see also Italian and
French above). The main ɸ-phrase stops at the verb *dará* 'will-give' and all follow-
ing constituents are right-dislocated. Each of them builds its own prosodic phrase,
which is outside the main ɩ-phrase (see Zubizaretta 1998 for Spanish, and also Fras-
carelli 2000 for Italian, Frota 2000 for Portuguese, and Astruc 2005, Feldhausen 2010
and Villalba 2000 for Catalan, all languages which present the same kind of right-
dislocation). I propose the same prosodic structure as in (12b), a similar example in
Italian, for which encliticization of a ɸ-phrase to the main ɩ-phrase was assumed.

(26)   (((No se   los   dará)$_\phi$)$_\iota$ (Juan)$_\phi$ (los libros)$_\phi$ (a María)$_\phi$)$_\iota$
        not CL.DAT them will.give Juan   the books   to Maria
    'Juan won't give Maria the books.'

To account for Kanerva's data in Chicheŵa, Truckenbrodt (1999) proposes an alignment constraint ALIGN-FOC-R requiring that each focused constituent be right-aligned with a ɸ-phrase boundary, thus a constraint similar to the constraints used in this paper. In his approach, ALIGN-FOC-R militates against the constraint WRAP, which demands that the whole sentence be contained in a single ɸ-phrase, and which is fulfilled in the default case (the all-new realization in (25a)). ALIGN-FOC-ɸ-R in T5 has the effect of introducing a prosodic break directly after the focused constituent. The additional phrasing between object and PP comes from the constraint ALIGN-XP-R, requiring that every syntactic maximal projection be right-aligned with a ɸ-phrase, a relatively low-ranking constraint, but which becomes active once WRAP has been rendered inactive by high-ranking ALIGN-FOC-ɸ-R, a case of Emergence of the Unmarked (McCarthy and Prince 1993). In T5, WRAP is only fulfilled when the whole VP is included in a single ɸ-phrase.[13]

T5 *anaményá nyúmba ndí mwála* (Foc = anaményá)	ALIGN- FOC-Φ- R	WRAP	ALIGN XP-R
a. ☞(anaméenyá$_F$)$_\Phi$ (nyuúmba)$_\Phi$ (ndí mwáála)$_\Phi$		*	
b. (anaményá$_F$ nyumbá ndí mwáála)$_\Phi$	*!		*
c. (anaméenyá$_F$)$_\Phi$ (nyúmba ndí mwáála)$_\Phi$		*	*!

I propose that final lengthening is just an indicator of finality, not of prominence or emphasis (as proposed by Downing et al. (2004) and Downing and Pompino-Marschall (2013) for some of their data), and that the only requirement for a focused constituent in Chicheŵa is that it be phrase-final, as originally proposed by Kanerva and captured by Truckenbrodt's (1999) analysis.

An additional argument for this simple analysis comes from the subject (see also Kanerva 1990:157,159 for prosodic phrasing of the subject). In an all-new sentence, or when it is given, the subject is phrased together with the verb. But when it is focused, as in (27), or when it is a topic it is in a separate ɸ-phrase (Cheng and Downing 2011). Again, a focused subject is obligatorily aligned with the right edge of a ɸ-phrase, see also (28) with VP focus and a topicalized subject.

(27)   {Who wrote the woman a letter?}
         ((Malúume$_F$)$_\phi$ (a-ná-lémbera   mkází   kálaatax)$_\phi$)$_\iota$
         1.uncle   1SUBJ-TAM-write.to 1.woman 9.letter
         'The uncle wrote the woman a letter.'

(28)   (M-fúumu)$_\phi$ (i-ná-pátsa   mw-aná zóóváala)$_\phi$
         9-chief   SIMPLE.PAST-give 1-child 10.clothes
         'The chief gave the child clothes.'

---

[13]In Truckenbrodt (1995), a different analysis was provided for the same data. One constraint required that a focus have the highest prominence in its domain, and another demanded alignment between the head of a prosodic phrase and its right edge. In other words, the focus was not directly aligned to a prosodic edge, but rather it was the need to be prominent which forced alignment, as was explained above with Italian, French and Hungarian.

Downing and Pompino-Marschall's (2013) data show that wh-phrases, which can be analyzed as focused, can also be phrased independently similar to the subject. In some cases, the wh-word is located after an argument, as shown in (29). This wh-word placement is compatible with the preference of the focus to be aligned with the right ɸ-phrase boundary.

(29)   (A-ná-páts-a   mw-aáná)ɸ (chiyáani_F)ɸ?
       9-SIMPLE.PAST-give 1-child   what
       'What did he give to the child?'

Examples of data inspected by Downing et al. (2004) for correlates of focus are shown in (30), with their proposed phrasing. In (30a), the indirect object is focused and in (30b) (see (29)), the direct object is focused. In both cases, the focus is aligned with the right edge of a ɸ-phrase, the final one in (30a) and the pre-final one in (30b).

(30)   a.   {(A-ná-pátsa   ndaání_F)ɸ (zóóváala)ɸ?}
            SIMPLE.PAST-give to-who   10.clothes
            'Who did he give clothes to?'
            A: (A-ná-páts-a   mw-aáná)ɸ (zóóváala_F)ɸ.
               SIMPLE.PAST-give 1-child   10.clothes
            'He gave the child clothes.'
       b.   What did he give to the child?
            A: (A-ná-páts-a   mw-aáná_F)ɸ (zóóváala)ɸ.
               SIMPLE.PAST-give 1-child   10.clothes
            'He gave the child clothes.'

Downing and Pompino-Marschall (2013) examine similar data, but different sentences, with careful experimental results from eight speakers. In this experiment, they find that focus may also have no phonetic effect at all. In particular, they show that focus may fail to raise pitch and to lengthen penultimate long vowels, see their Fig. (17) beside their statistical analysis. They propose that earlier experiments, including their own, in which it was shown that focus has a prosodic effect compatible with phrasing and/or prominence, only revealed the effects of what they call "emphasis", and they suggest that emphasis is not part of the grammar. Only one of their speakers phrases a final focus separately (see their Fig. (22)). In my view, it is impossible to separate focus from emphasis in an experiment eliciting a narrow focus with a wh-phrase. As a result, I suggest that all speakers have realized the intended focus. In doing so, some speakers have no phonetic correlates of focus and some have. The speaker who phrased the focus independently also raised the pitch contour of the focused constituent, and this effect can be analyzed as reset at the beginning of a new ɸ-phrase. In other words, even if the effect is not systematic, Downing and Pompino-Marschall (2013) find that if there is a grammatical effect of focus, then it is by creating a ɸ-phrase aligned with the focused constituent.

To conclude, most studies on this language show that focus in Chicheŵa is right-aligned with an ι-phrase, when possible, otherwise with a ɸ-phrase. Alternatively, focus has no phonological correlate. Penultimate lengthening accompanying prosodic phrases cannot be understood as prominence because lengthening also accompanies

phrases built on given constituents, which are arguably realized without prosodic prominence.

5.1.2 Northern Bizkaian Basque

Elordieta et al. (1999) and Elordieta (2007) demonstrate for Northern Bizkaian Basque, also called 'Lekeitio Basque,' that the requirement for a focus to be aligned with the right edge of a ϕ-phrase may be incompatible with other grammatical restrictions. This variety of Basque has lexically accented and lexically unaccented words (see Hualde et al. 2002 for an overview of dialectal variations in Basque). A lexically unaccented word cannot be phrased by itself and has to be integrated into the ϕ-phrase formed by the next accented word. Moreover, there is a strong requirement that a focused word has to be right-aligned in its ϕ-phrase in order to get a pitch accent since it is always the last word of the ϕ-phrase which gets the accent. In (31), an example from Hualde et al. (2002:551), the answer to the question in curly brackets requires that the unaccented noun *txakur* 'dog' be narrowly focused. Because it is unaccented, it is unable to get a pitch accent. An unaccented word can only get an accent if there is no following accented word. Only in this case can it be the last word of a ϕ-phrase and get a pitch accent. In (31) however, *txakur* is followed by the accented word *baltzá*, and for this reason, it has to be contained in the same ϕ-phrase as this word. As a result, the answer in (31a) is ambiguous in three ways: *I saw the* [*black*]$_F$ *dog*, *I saw the black* [*dog*]$_F$, and *I saw the* [*black dog*]$_F$. Both (31b) and (31c) are ungrammatical: (31b) because the unaccented word *txakur* cannot form its own ϕ-phrase, and (31c) because the accent is on the wrong word.[14]

(31)   {Did you see the black cat?}

     a.   ((Txakur BALTZÁ)$_\phi$ (ikusi dot)$_\phi$)$_\iota$
            dog   black   see   AUX
           'I saw the black DOG!'

     b.   ∗ ((TXAKUR)$_\phi$ (BALTZÁ)$_\phi$ (ikusi dot)$_\phi$)$_\iota$

     c.   ∗ ((TXAKUR baltzá)$_\phi$ (ikusi dot)$_\phi$)$_\iota$

Gussenhoven (2004:180) proposes the constraint (32a) for Basque, which right-aligns the XP containing the focus constituent with a high tone. In the example (31), the high tone is obligatorily associated with the lexical stress present in the XP containing the focus constituent. The effect of this constraint is illustrated in T6. It is shown that *txakur* cannot get a pitch accent since high-ranking DEP(H∗) blocks pitch accent assignment. Every ϕ-phrase must contain a pitch accent. Since the NP *txakur baltzá* cannot be discontinuous (see Fanselow and Féry 2006), and the order of the noun and the adjective cannot be changed, there is no other solution than to misalign the focus. This is reminiscent of the 'three cherries' example in Italian (see Sect. 4.1). But here the reason for the blocking is half phonological and half syntactic, whereas in Italian, the reason was purely syntactic.

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[14]Only a stronger focus on the hierarchy given in (6) can have the effect of lifting this restriction.

(32)   a.   ALIGN-FOC-H*−R: Align the right edge of the XP containing the fo-
              cus constituent with the nuclear H*L.
        b.   DEP(H*): No epenthesis of H*.

T6 illustrates that ALIGN-FOC-ɸ-R is relatively low ranking in Basque, and is
dominated by DEP(H*), ALIGN-FOC-H* − R and CWO.

T6 *txakur baltzá ikusi dot* (Foc = txakur)	DEP(H*)	ALIGN-FOC-H*-R	CWO	ALIGN-FOC-Φ-R
a. ☞(Txakur_F BALTZÁ)_Φ (ikusi dot)_Φ				*
b. (TXAKÚR_F)_Φ (baltzá)_Φ (ikusi dot)_Φ	*!			
c. (BALTZÁ txakur_F)_Φ (ikusi dot)_Φ		*!	*!	

5.1.3 Konkani

The Indo-Aryan language Konkani, spoken in Goa, is a typical Indian language as
far as its intonational properties are concerned. It has been shown for Indo-Aryan
languages that ɸ-phrases are delimited to the left by a low tone, often but not always
analyzed as a pitch accent, depending on the language (see Hayes and Lahiri 1991;
Khan 2008, 2011 for Bengali; Patil et al. 2007 for Hindi, among others). Regardless
of the best analysis of the low tone, it is conspicuous that the tonal structure of these
languages is organized around phrases, rather than around pitch accents, as in Ger-
manic languages. Most non-final ɸ-phrases are delimited to the right by a high tone,
often analyzed as a phrasal boundary tone. Some authors propose that the higher level
achieved on the high tone of a focused constituent is the effect of a special focus tone
(see for instance Khan for Bengali). The last ɸ-phrase of a declarative sentence, or of
any sentence with a general falling pattern, has a different contour. It starts high and
falls down to the speaker's bottom line.

Konkani is no exception to this intonational pattern. The typical intonation struc-
ture consists of non-final ɸ-phrases tonally delimited to the left by a low tone and to
the right by a high tone, plus a final falling ɸ-phrase. There is no literature on the
prosody of this language so that the question of whether the initial low tone is a pitch
accent or rather an initial boundary tone has to be left for future research. For the
concerns of the present paper, it is conspicuous that focus is aligned to the right edge
of a ɸ-phrase. In this language, as well as in other Indo-Aryan languages, the verb is
always final.

In the results for *Anima* in Konkani (see Table 3), reordering to OSV is marginal
and licensed by agent focus (2/12). The given element was sometimes elided (2/23).
Reordering and elisions are concomitant with preverbal focus.

Three examples of utterances appear in (33).

(33)   a.   New agent (S_FOV)
              {Who is pushing the car?}
              (([Ek daadlo]_F)_ɸ (ghaadi dukhalta)_ɸ)_ɩ
                  a   man-M   car-F   push-3SG.PRS
              'A man pushes a/the car.'

Table 3 Word order in the experiment *Anima* for Konkani		SOV	SV	OSV	OV
Agent new ($n = 6$)		5	1	–	–
Agent correction ($n = 6$)		4	–	2	–
Patient new ($n = 6$)		5	–	–	1
Patient correction ($n = 5$)		5	–	–	–

b. Agent correction (S$_F$OV)
{Inside the house: Is a woman cutting the watermelon?}
Naa, (([ek daadlo]$_F$)$_\phi$ (kaalingak torta)$_\phi$)$_\iota$
no, a man melon pierces
'No, a man is cutting the melon.'

c. Patient new (SO$_F$V)
{In front of the fence, what is the girl hitting?}
((ten haatodi)$_\phi$ ([ghaadiyeher]$_F$)$_\phi$ (marata)$_\phi$)$_\iota$
she with-hammer car-OBL-LOC hits
'She is hitting the car with a hammer.'

As in other Indian languages, the tonal structure of Konkani is phrase-based rather than word-based. The typical pattern of non-final prosodic phrases with a low tone at the beginning of the phrase and a high tone at the end is shown in Fig. 2 with a new agent at the beginning of the sentence, and in Fig. 3 with an object correction. The boundary tone at the end of the focused phrase is higher than when it is not focused, and the following φ-phrases are realized in a compressed pitch range (see Patil et al. 2007 for similar results in Hindi). It is to be noticed that the typical φ-phrase pitch pattern is still present: in particular the word *ghaadi* 'car' is provided with an initial low tone and a final high tone; although the rise is very small, it is clearly perceivable.

In Fig. 3, with an object correction, the object is the second φ-phrase of the sentence. Here the final boundary tone is as high as that of the first φ-phrase, showing that there is no compression of the pitch range. Notice that in the normal case, the object and the verb are included in the same φ-phrase, but it is obvious that in this case the focused constituent can create a φ-phrase. This has also been shown by Hayes and Lahiri (1991) for Bengali and by Keane (to appear) for Tamil, a Dravidian language presenting tonal properties similar to those in Indo-Aryan languages.

In both cases, the final φ-phrase is realized with a relatively flat pattern or even a falling pattern, signaling the end of a declarative sentence.
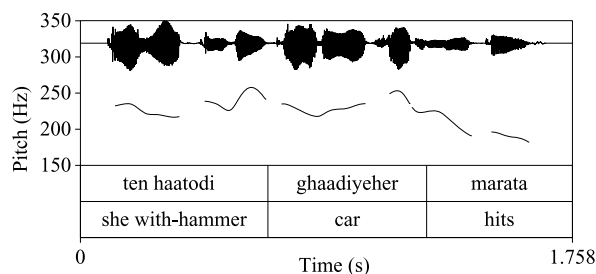
In the present account, the focus is aligned with the right boundary of a φ-phrase. Due to the obligatory verb-final syntactic structure, a focused object cannot be final in its ι-phrase. T7 illustrates that CWO blocks candidate b., where focus is aligned with the ι-phrase.

In short, the prosodic strategies for the expression of information structure in Konkani are varied: additional φ-phrases, increased intensity and some amount of postnuclear register compression are the factors identified in the *Anima* experiment. The tonal realization of the initial low tone and of the final high tone in each prosodic phrase is expanded when the phrase contains a focused element. Focus also has the

Fig. 2 New agent in Konkani

| Ek daadlo | ghaadi | dukhalta |
| A man | car | pushes |
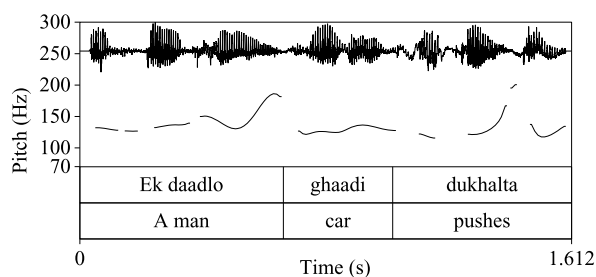
Fig. 3 Object correction in Konkani

| ten haatodi | ghaadiyeher | marata |
| she with-hammer | car | hits |

T7 *ten haatodi ghaadiyeher marata* (Foc = ghaadiyeher)	CWO	ALIGN-FOC-ɩ-R	ALIGN-FOC-Φ-R
a.☞((ten haaatodi)_Φ (ghaadiyeher_F)_Φ (marata))_I		*	
b. ((ten haatodi)_Φ (marata)_Φ (ghaadiyeher_F)_Φ)_I	*!		

power to create a new phrase by delimiting the focus to the right. Givenness is expressed by postfocal compression.

5.2 Left-alignment with a ɸ-phrase: Georgian

It was shown in Sect. 4 that, as far as ɸ-phrase alignment is concerned, most languages align focus to the right; only Hungarian was shown to use left alignment with an ɸ-phrase. A similar observation applies again when considering ɸ-phrases. Most languages that align focus with a ɸ-phrase choose the right edge of this constituent. Georgian is one of the few languages aligning focus to the left boundary of a ɸ-phrase (see Selkirk and Shen 1990 for a possible application in Shanghai Chinese).

In Georgian, the focused constituent is generally preverbal (Aronson 1982/1990; Boeder 2005; Harris 2000; McGinnis 1997a, 1997b; Nash 1995 and Skopeteas and Fanselow 2010a, 2010b), although a postverbal focus is also grammatical. In all cases, focus is adjacent to the verb. Georgian has 'free word order,' and there is a debate in the literature as to whether the unmarked word order is SVO or rather SOV. Skopeteas and Fanselow (2008, 2010a, 2010b) present convincing arguments for considering SOV the unmarked order. They account for the more marked SVO order in terms of syntactic fronting. We will see below that the prosodic facts confirm their analysis: SOV word order goes along with integration of the object and the verb into a single ɸ-phrase, whereas a postverbal object is prosodically separated from the preceding verb, speaking for right-dislocation.

| Table 4 Word order in the experiment *Anima* for Georgian	SVO	OSV	SOV	OV	OVS
Agent new ($n = 7$)	4	3	–	–	–
Agent correction ($n = 7$)	5	2	–	–	–
Patient new ($n = 8$)	3	–	3	1	1
Patient correction ($n = 8$)	–	–	7	1	–

First, compare the word order results of *Anima* for Georgian in Table 4. When the agent—realized as a subject—was focused, the focused subject was always preverbal, in which case the given patient—the object—was either postposed (SVO, with a flat intonation and all features of givenness on the object) or preposed (OSV, with a topicalized and fully intonated object). When the patient was focused, mostly preverbal focus (O_FV) was realized. The given subject usually stayed in its canonical position (SO_FV) and was phrased separately, as a topic, but in one case (out of 14), it was postposed; the subject was deleted in two instances, in which case the object was aligned with the beginning of the ι-phrase. Finally, there were also three instances of a postverbal focused object SVO_F.

Some examples of realizations in the context of *Anima* appear in (34).

(34)   a.   Agent correction (S_FVO)
          {In the scene in front of the well: Is a woman pushing a man?}
          ara, (($k'atsi_F$ ats'veba   k'atss)$_\phi$)$_\iota$
          no, man   is-pushing man
          'No, a man is pushing the man.'
    b.   Agent correction (OS_FV)
          {In the scene with the blue sky: Is a man hitting the man?}
          ara, ((k'atss)$_\phi$ ($kali_F$ urts'q'am)$_\phi$)$_\iota$
          no, man   woman is-hitting
          'A woman is hitting the man.'
    c.   Patient new (SVO_F)
          {In the scene in front of the fence, what is the girl hitting?}
          ((gogo   u-rt'q'-am-s)$_\phi$ (mankana-s_F)$_\phi$)$_\iota$
          girl-NOM hits   car-DAT
          'The girl is hitting a car.'

The prosodic realization of left-aligned focus in Georgian is best illustrated with data from another production experiment in which six native speakers read sentences denoting simple transitive actions with different word orders (SOV, SVO, OSV, etc.) and in different information structural contexts (all-new, and new information focus on the subject, the object, the verb and the VP); see Skopeteas and Féry (2010). In this experiment, it was found that information structure is expressed primarily by means of prosodic phrasing, and only secondarily by pitch accents. Consider first a typical realization of a sentence in an all-new context realized with the unmarked word order SOV, shown in (35) and illustrated with a pitch track in Fig. 4. The initial subject has a high tone on the lexically stressed first syllable and a low tone on the
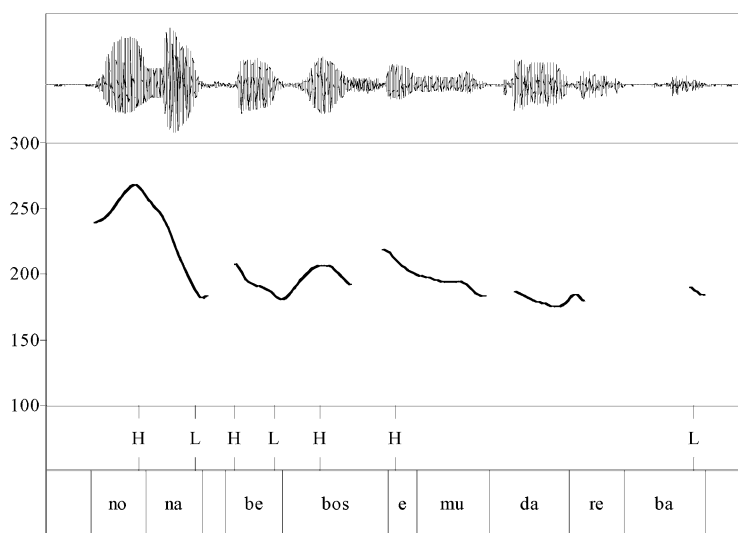
Fig. 4 A Georgian all-new sentence with SOV word order

second syllable. This sentence reflects the unmarked phrasing, with the subject, verb and object phrased in one φ-phrase.

(35)   All-new sentence (SOV)_F

> {What happens?}
> ((nona   bebos   emudareba)_φ)_ι
> Nona.NOM grandmother.DAT begs
> 'Nona begs for the grandmother.'

The second sentence in (36) shows a preverbal subject focus (OS_FV). The first constituent of the sentence carried a low tone on its first syllable and a high boundary tone on its last syllable in nearly 90 % of the cases. It must be noted that the nouns chosen in this experiment always had their lexical stress on the first syllable (see Robins and Waterson 1952; Aronson 1982/1990 for lexical stress in Georgian, and Vicenik and Jun, to appear, for a different analysis of Georgian prosody), so that the high tone on the last syllable could not be interpreted as a pitch accent. Compare Fig. 5 illustrating (36). Again the second φ-phrase is downstepped relative to the first one, although the second φ-phrase is the focused one. This realization differs from what we know from English or German, where a focus constituent is often as high in pitch as the preceding topic constituent.

(36)   New patient (SO_FV)

> {Who hides herself from the girl?}
> ((gogo-s)_φ (nana_F   emaleba)_φ)_ι
> girl-dat   Nana.NOM hides.from
> 'Nana hides herself from the girl.'
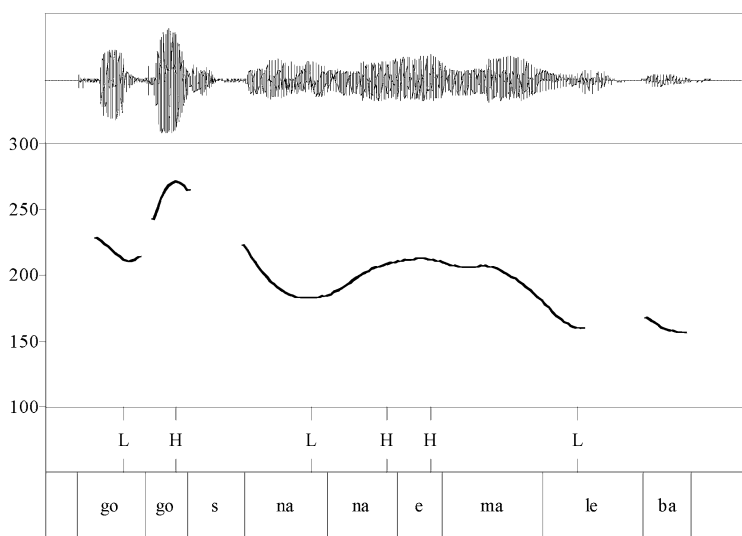
Fig. 5 A Georgian sentence with OSV word order and focus on the subject

When the focus object was postverbal (SVO_F), it was always prosodically separated from the verb. The prosodic separation between the verb and the object was expressed by a high boundary tone on the last syllable of the verb. Moreover, the object was often realized with an extra-low tone when it was postverbal, again in contrast with the realization of focus in a Germanic language, where a focused constituent carries a high pitch accent. Compare Fig. 6 illustrating (37). The subject has a high tone on its first syllable and a low tone on its last syllable, which, as before, can be interpreted as a reflex of integration in a single ɸ-phrase with the verb. But the object starts high, at the level of the high boundary tone on the verb, and is realized with a very steep fall on its first syllable. The whole word *mamas* 'father' is perceived as low.

(37)   New patient (SVO_F)

        {About whom does Nino care?}
        (((nino   eloliaveba)_ɸ)_ι (mama-s_F)_ɸ)_ι
        Nino.NOM cares.about   father-DAT
        'Nino cares about the father.'

In sum, Georgian requires that focus be delimited to its left by a ɸ-phrase boundary and be adjacent to the verb. The boundary is expressed by a high tone on the last syllable of the preceding ɸ-phrase. This requirement is so strong that it overrides lexical stress. In the optimality-theoretic framework proposed here, both restrictions need to be accounted for. The constraint ALIGN-FOC-ɸ-L takes care of the first restriction, and the constraint VERBADJACENCY, inspired by Skopeteas and Fanselow (2010b) and formulated in (38a), expresses the second restriction. Moreover, the constraint TOPIC in (38b) requires a topic to be initial in its domain.
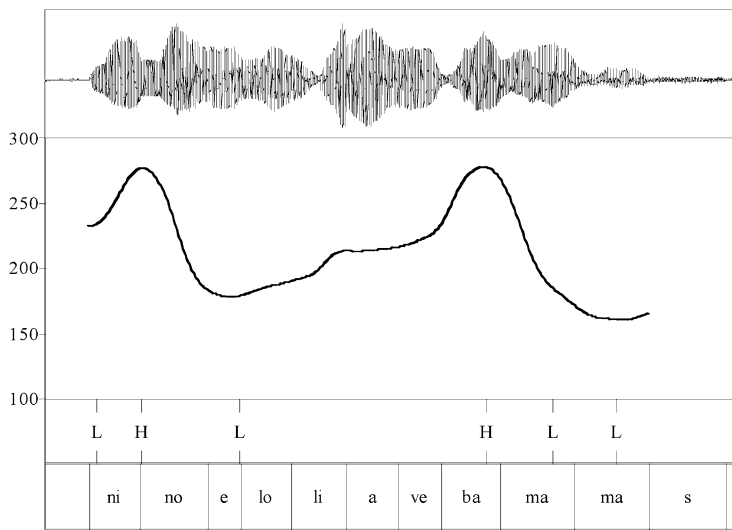
Fig. 6 A Georgian sentence with SVO word order and focus on the object

(38) a. VERBADJACENCY: Focus is adjacent to the verb.
      b. TOPIC: Topic is initial in its domain.

T8 illustrates agent focus realized as OSV or SVO, as observed in *Anima*. Both candidates a. and b. are optimal in T8. Candidates c. and d. are eliminated by VERB-ADJACENCY and ALIGN-FOC-ɸ-L respectively. Candidate a. violates CWO and candidate b. violates TOPIC. A more detailed account of word order in Georgian is needed to explain the choice between different possible word orders.

T8 *k'atsi ats'veba k'atss* (Foc = k'atsi) man is-pushing man	VERBADJ	ALIGN- FOC-ɸ-L	CWO	TOP
a. ☞ ((k'atss)_ɸ (k'atsi ats'veba)_ɸ)_ι			*	
b. ☞((k'atsi ats'veba k'atss)_ɸ)_ι				*
c. ((k'atsi)_ɸ (k'atss ats'veba)_ɸ)_ι	*!			
d. ((k'atss k'atsi ats'veba)_ɸ)_ι		*!	*	

This closes the review of examples of languages aligning a focus constituent with a prosodic constituent by directly changing the word order or the prosodic structure. In the next section, more difficult cases are discussed, namely languages in which focus is not directly aligned with a prosodic constituent, but in which another component of grammar intervenes in order to simulate alignment. In the first case, it is the metrical structure and in the other, morphology.

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6 Indirect alignment

In this section, two cases of indirect alignment are examined: first, pitch accent in situ plus deaccenting, as found in English and German, and second, morphological marking of focus as in some Kwa, Gur and Chadic languages.

6.1 Deaccenting as alignment of pitch accents: German

Germanic languages like English, German and Dutch have been decisive for the emergence of 'focus as prominence' theories. These languages assign a pitch accent to a narrow focus, often in situ, and deaccent postfocal material. In models accounting for degrees of accents with metrical grids (Liberman and Prince 1977; Hayes 1995; Selkirk 1984 and many others), focus is represented with the highest column of metrical positions. This is illustrated in (43) and (44) below with sentences from *Anima*.

Truckenbrodt (1995:131ff) proposes accounting for accent of a focused constituent in situ followed by deaccenting of postfocal constituents with alignment. He relates alignment to prominence in all languages, because heads of constituents are assumed to be necessarily aligned to the right or left edge of their prosodic domain. The effects of focus on phrasing amount to insertion or deletion of φ-phrase boundaries, which follow immediately from the requirement that a focus be the most prominent element in its domain. In other words, in this approach, alignment and prominence are conceptually not distinguished. Being prominent is equivalent to being aligned and vice versa (see also Büring 2010, who adopts this view, but who also has a more general conception of what it means for a focused constituent to be prominent; see below). In Truckenbrodt's original approach, alignment is expressed by constraints aligning prominence with edges of constituents (see above for an illustration in Italian). Prominence as a consequence of focus is expressed by FOCUS, a constraint to this effect; see (39) from Truckenbrodt (1995:134).

(39)   FOCUS
         If F is a focus and DF is its domain, then the highest prominence in DF will
         be within F.

A candidate is always possible which fulfills both ALIGN and FOCUS if φ-phrase boundaries can be freely added or deleted, with a preference for the addition of a boundary, because this aligns not only the stress but also the segmental material with a boundary. (40) adapted from Truckenbrodt (1995:139) illustrates the phrasing and prominence options for a sequence of two words in which the first one is in focus. Subscripted DF stands for Domain of Focus, which includes the two words. Both (40a) and (40c) violate the align constraint requiring that the head of a φ-phrase be aligned with the right edge of the φ-phrase. See the right column in (40), which shows the violations of ALIGN(ϕ, R, x_ϕ, R), the constraint aligning the head of a φ-phrase with the right boundary of the φ-phrase. In both cases, the head is on the first word of the φ-phrase. The best configuration inserts a φ-boundary after the focus, as in (40b), thus after the first word at the level of the φ-phrase. This boundary is inserted as compared to the boundary created by the syntactic structure, which right-aligns every syntactic maximal projection with a φ-phrase boundary, as in (40a). Syntactically,

Table 5 Word order in the experiment *Anima* for German

	SVO	Cleft
Agent new ($n = 8$)	7	1
Agent correction ($n = 8$)	8	–
Patient new ($n = 8$)	8	–
Patient correction ($n = 8$)	8	–

the two words are included in a single ϕ-phrase. In (40b), a boundary is inserted after word1 even though there is no need for this boundary from the point of view of the syntax. And in (40c), word2 is grouped into the same prosodic word as word1, deleting in this way the metrical position separating the head of word1 from the edge of the ϕ-phrase. This boundary deletion has the effect of deleting the head of word2.

(40) ALIGN(ϕ, R, $x_ϕ$, R)

<pre>
    a.   x
         (x   x   )ϕ
         (   )(   )w
          word1 word2   word2!
         [FOC   ]DF
    b.   x
            x   x
         (x)(x)ϕ
         (   )(   )w   Winner
          word1 word2
         [FOC   ]DF
    c.   x
         (x   )ϕ
         (   )w
          word1 word2   word2!
         [FOC   ]DF
</pre>

In this approach, insertion and deletion of boundaries are motivated by the needs for prominence. Focus is by itself not able to trigger such an effect on phrasing. Alignment is achieved for the sake of prominence and only indirectly for the sake of focus. In this approach, alignment is fulfilled by the prosodic head rather than the segmental material of the focused constituent.

In Féry and Samek-Lodovici (2006), Truckenbrodt's (1995) proposal is implemented for German. But there, instead of inserting or deleting boundaries, the constraint DESTRESS-GIVEN, as formulated in (41), is proposed.

(41) DESTRESS-GIVEN
     A given phrase is prosodically non-prominent.

This constraint directly addresses given material and requires all lexical prominence to be deleted without automatically changing the phrasing.

As visible from the results of *Anima*, in short sentences, word order remained canonical when the information structure changed. There was only one cleft sentence

in the agent new answers. All other answers in all conditions displayed the canonical word order. Two examples appear in (42).[15]

(42)   a.   Patient new (SVO$_F$)
               {[...] what is the man kicking?}
               ((Der MANN)$_\phi$ (tritt einen STUHL$_F$)$_\phi$)$_\iota$
               the   man   kicks   a   chair
               'The man is kicking a chair.'
         b.   Agent correction (S$_F$VO)
               {[...] is a woman cutting the watermelon?}
               Nein, ((ein MANN$_F$)$_\phi$ (schneidet die Melone)$_\phi$)$_\iota$
               no,   a   man   cuts   the melon
               'No, a man is cutting the melon.'

In the case of (42a), the focus is perfectly aligned, and nothing happens as compared to an all-new realization. This is an example of an ambiguous default accent.[16] In (42b), however, the focus is on the subject and is followed by a given VP. (43) and (44) show metrical translations of these examples, with both a prosodic and a metrical structure taking into account the predicate-argument structure of the sentence. In (43), corresponding to (42a), every prosodic constituent has a head, and the last (embedded) φ-phrase *einen Stuhl* 'a chair' carries the nuclear accent of the whole sentence. In (44), by contrast, the first φ-phrase *ein Mann* 'a man' carries the nuclear pitch accent, and the following φ-phrases are deaccented (see Féry 2011 for a detailed account of sentence accent in German). The accent signaling agent focus is thus in a position where it is maximally misaligned as far as word order is concerned. We follow Truckenbrodt's approach by assuming that the accent is nevertheless rightmost in its domain, since there are no accents following the early one, with the possible exception of the lexical stresses.

```
                                x                 ι-phrase
                 x              x                 φ-phrase
                 x       x      x                 word
(43)     ((Der Mann)ϕ (tritt (einen STUHLF)ϕ)ϕι
```

```
              x                                   ι-phrase
              x                                   φ-phrase
              x         x            x            word
(44)     ((ein MANNF)ϕ (schneidet (die Melone)ϕ)ϕ)ι
```

In other words, alignment applies to metrical heads of prosodic constituents rather than to words or syllables. At the highest level of metrical structure, the rightmost

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[15]Dutch and English behaved like German in the *Anima* experiment.

[16]Depending on the location of the accent, it can stand just for itself or project to a larger syntactic constituent (see Selkirk 1995; Rochemont 1986; Uhmann 1991; Cinque 1993 and many others). This property has been called 'integration' by Fuchs (1976) and Jacobs (1993), and 'subordination' by Wagner (2005) who proposes a different explanation of this property than the one shown in this section. The rules underlying the faculty of an accent to project to a larger constituent have been discussed a number of times in the literature. I refer the reader to Gussenhoven (1992), Truckenbrodt (2007) and Féry (2011) for OT analyses.

head of the ι-phrase is the most prominent one. This happens both in all-new sentences and in sentences containing a narrow focus. Prominence is the addition of a pitch accent, and alignment is achieved by deaccenting the postnuclear material. It is thus proposed that deaccenting of given material in the postnuclear part of the sentence as opposed to maintenance of pitch accent in the prenuclear domain is an indirect case of alignment. The DESTRESS-GIVEN constraint of Féry and Samek-Lodovici (2006) is not able to account for the asymmetry in the deaccenting strategy of languages such as German, and in fact all theories which do not directly address the asymmetry between pre- and postnuclear givenness do not account for the alignment effect. In the proposal of the present paper, if metrical heads count for alignment, the symmetry is explained. Deaccenting affects only postfocal material to allow the metrical head to be right-aligned, but the prefocal material is left untouched or only slightly compressed because additional accents in this position do not affect right-alignment.

These results of *Anima* do not imply that German has an inflexible word order. On the contrary, word order may vary to a considerable extent (see for instance Lenerz 1977 for the factors triggering word order changes in German). However, they do show that in the kind of short sentences with two full nominals used in the present paper, pitch accents can be assigned in situ. This strategy has been repeatedly discussed in the literature and has served to contrast Germanic languages like German and English with Romance languages like Italian and Spanish, which move their constituents for the sake of focus more easily (see Vallduví 1992; Samek-Lodovici 2005, 2006 and Zubizaretta 1998 among others).

An OT account of the sentence (42b) uses the same constraints as before with one addition. (45) is formulated similarly to (41). It just adds that it is the postnuclear part of a sentence which is deaccented.

(45)   DESTRESS-GIVEN (DG)
        A postnuclear given phrase is prosodically non-prominent.

T9 shows that in a language like German, ALIGN-FOC-ι-R is relatively low ranking. HEAD-ι-RIGHT and DESTRESS-GIVEN are responsible for aligning the accent, and alignment of the focus thus happens in an indirect way. Although it violates both HEAD-ι-RIGHT and ALIGN-FOC-ι-R, optimal candidate a. is better than a candidate preserving the pitch accent on a final constituent. <> delimits the deaccented material. The tableau ignores candidates with changed word order, which are possible in German, but which were not chosen by the participants in the experiment *Anima*. CWO is assumed to be unviolated in the tableau.

T9 *ein Mann schneidet die Melone* (Focus = ein Mann)	DG	H-ι-R	ALIGN-FOC-ι-R
a. ☞((ein MANN)$_\Phi$(<schneidet die Melone>)$_\Phi$)$_\iota$		*	*
b. ((ein MANN)$_\Phi$ (schneidet die MELONE)$_\Phi$)$_\iota$	*!		*

6.2 Subject/Non-subject asymmetry in morphological marking of focus

The second case of indirect alignment concerns languages with morphological focus markers. In a number of languages, a focus marker obligatorily follows or precedes the focused subject, whereas a focused object as well as other kinds of non-subject constituents are only optionally followed or preceded by a focus marker (see Aboh 2004; Fiedler et al. 2010; Green and Jaggar 2003; Reineke 2006a, 2006b, and others), especially when the non-subject constituents are sentence final. This phenomenon has been called the 'subject/non-subject asymmetry.'[17] This asymmetry can be straight-forwardly explained in the FA model but is difficult to account for in the FP model. A constituent right-aligned in the canonical order does not need to be marked in the prosody or in the syntax. It is sufficiently aligned. But a non-aligned constituent needs some extra marking.

It is usually assumed that focus markers have only a pragmatic role (see for instance Aboh 2010). However, if this is true, their absence in the case of perfect alignment of a non-subject cannot be accounted for. If they are necessary for marking a constituent as focused, they should always be present. I propose that, besides its pragmatic role, a focus marker often has an additional prosodic role: it delimits the focus, even if it does not have another prosodic correlate like a boundary tone or duration. I suggest that the addition of a morpheme realized by at least one syllable (the focus marker itself) may be considered a non-trivial prosodic operation. It adds an element possessing weight to which the speakers of the language are sensitive. In this way, it may serve the purpose of aligning a focused constituent. It is not an accident that the languages predominantly using focus markers are tone languages with minimal use of intonation for pragmatic purposes. These languages cannot add tonal information like pitch accents or boundary tones as freely as intonation languages and are obliged to use other grammatical reflexes for the expression of focus.

6.2.1 Focus marker to the right of the focus: Fon, Ditammari and Hausa

Consider first some examples from Fon (Kwa, Gbe) in (46), from Fiedler et al. (2010) and Schwarz and Fiedler (2007), a typical language with a subject/object asymmetry.[18] A subject focus, as in (46a), remains in situ, but it is obligatorily followed by the focus marker (FM) *wὲ*. If it is absent, *nyɔ́nú ɔ́* 'the woman' is not focused. In the case of object focus, several options compete. In (46b) with a focused object, nothing special happens in the grammar, the object remains in situ, and no morphological marking is needed. According to Fiedler et al., this is the most common reply for an informational focus. In (46c), the object is fronted, and optionally followed by *wὲ* (see Aboh 2004 for the same or similar patterns in other Gbe languages). As for the prosodic structure, I propose that the focus marker in (46a) and (46c) introduces at the same time a prosodic boundary which is absent in (46b). The only correlate of the prosodic boundary seems to be the morpheme: As compared to a version without the

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[17]It should be noted that this subject/non-subject asymmetry was already observed for German, Italian, French and Chicheŵa above, where it was shown to correlate with canonical vs. non-canonical word order.

[18]The language's name is sometimes written *Fɔn* or *Fongbe* in the literature.

focus marker, a syllable has been added. These remarks are preliminary, and more research is needed to investigate the prosodic structure of Fon.

(46)   Fon (Kwa, Gbe)
    a.   New agent (S_FVO)
        {Who ate the beans?}
        ((nyɔ́nú$_F$ ɔ́   wɛ̀)$_\phi$ (ɖu àyìkún)$_\phi$)$_\iota$
        woman DEF FM eat bean
         '[The woman]$_F$ ate the beans.'
    b.   New patient (SVO$_F$)
        {What did the woman eat?}
        ((é   ɖù àyìkún$_F$)$_\phi$)$_\iota$
        3SG eat bean
        'She ate [beans]$_F$.'
    c.   New patient (O$_F$SV)
        ((àyìkún$_F$ (wɛ̀))$_\phi$ (é   ɖù)$_\phi$)$_\iota$
         bean   (FM) 3SG eat
        'She ate [beans]$_F$' ∼ 'It is [beans]$_F$ that she ate.'

To account for (46) in the OT framework proposed, only one additional constraint is needed. We find the same ranking between CWO, ALIGN-FOC-ι-R and ALIGN-ɸ-R as in Chicheŵa, but the correlate of a prosodic boundary differs. In Chicheŵa, a ɸ-phrase boundary is indicated by lengthening of the penultimate vowel. In Fon, I tentatively propose that the focus marker has the same role as lengthening in Chicheŵa, namely that of a prosodic marker. A constraint DEP-FM, militating against epenthesis of focus markers, formulated in (47) is needed. This constraint blocks the insertion of focus markers in T10, since the focused object is perfectly aligned with the end of the ι-phrase. But the constraint is violated by the optimal candidate in T11, for subject focus in situ, which needs to be aligned in its ɸ-phrase. In this case, addition of *wɛ* marks the right edge of the focus. If it is not there, as in candidate c., there is also no ɸ-phrase boundary, and ALIGN-FOC-ɸ-R is violated. Candidate b. is eliminated because it violates CWO. To account for (46c), additional motivation is needed, which is discussed for Hausa and Bole.

(47)   DEP-FM
    No epenthesis of focus markers.

T10 nyɔ́nú ɔ́ ɖu àyìkún (Foc = àyìkún)	CWO	ALIGN FOC-ι-R	ALIGN FOC-Φ-R	DEP-FM
a. ☞((nyɔ́nú ɔ́ ɖu àyìkún$_F$)$_\phi$)$_\iota$				
b. ((nyɔ́nú ɔ́ ɖu àyìkún$_F$ wɛ̀)$_\phi$)$_\iota$				*

T11 nyɔ́nú ɔ́ ɖu àyìkún (Foc = nyɔ́nú)	CWO	ALIGN FOC-ι-R	ALIGN FOC-Φ-R	DEP-FM
a. ☞((nyɔ́nú$_F$ ɔ́ wɛ̀)$_\Phi$ (ɖu àyìkún)$_\Phi$)$_\iota$		*		*
b. ((ɖu àyìkún nyɔ́nú$_F$ ɔ́)$_\Phi$)$_\iota$	*!			
c. ((nyɔ́nú$_F$ ɔ́ ɖu àyìkún)$_\Phi$)$_\iota$		*	*!	

In Ditammari (Gur) (Reineke 2006a, 2006b; Fiedler et al. 2010), focus markers also appear to the right of the focused constituent. But in this language, they are present both in subject and in object focus. These morphemes are associated with independent pragmatic and inflectional functions, and they may trigger a small prosodic break (see for instance the description in Reineke 2006a, 2006b).[19] The data in (48) illustrate two possibilities to mark object focus. In (48a–b), the object remains in situ and is followed by the FM *ǹyā* or *è*, which also indicates gender agreement. In (48c–d), the same morphemes follow the preposed ex-situ objects. But in (48c) the low-toned postverbal morpheme *mà*, not present in (48a), is required in sentence-final position. Reineke (2006a) analyzes it as a morpheme delimiting the given part of the sentence to the right. (48d) shows still another way to express focus: namely by clefting the element in focus. In all variants, the focus is followed by a special morpheme.[20],[21] I follow Reineke's description in proposing that prosodic phrasing accompanies the focus marking.

(48)   Ditammari (Gur)

   a.   New patient (SVO_F)
        {What did the woman eat?}
        ((ò dī yātǜrà_F   ǹyā   )_φ)_ι
        3SG eat PL.bean.PL FM.CL
        'She ate [beans]_F.'

   b.   New patient (SVO_F)
        {What did the child buy?}
        ((bíígō nūndɔ̀   bànānā_F è)_φ)_ι
          child buy.PAST banana   FM
        'The child bought [bananas]_F.'

   c.   Identificational patient (O_FSV)
        ((yātǜrà _F ǹyā)_φ (ò   dī mà)_φ)_ι
          bean.PL FM.CL 3SG eat MA
        'She ate [beans]_F.' ∼ 'It is [beans]_F that she ate.'

   d.   Identificational patient (O_FSV, cleft sentence)
        ((bànānā_F è   ù)_φ)_ι   ((ń nūndɔ́   hɑ́)_φ)_ι
        banana   FM CL.SUBJ REL buy.PAST CL.REL
        'It is [bananas]_F that she bought.'

The Hausa examples in (49) illustrate that the choice between left-dislocating an object or leaving it in situ can have a pragmatic effect; see Fiedler et al. (2010), Green

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[19]From Fiedler et al. (2010:237): "The class of morphological focus markers is not homogeneous but comprises at least the following list of formal elements, many of which also occur independently in non-focus contexts: (i) invariant information-structural particles; (ii) particles agreeing in gender with the focused NP/DP; (iii) copulas; and (iv) nominal affixes."

[20]Reineke (2007) shows for another Gur language, Byali, that an ex-situ focus strategy has an identificational function for non-subjects. An informational role is expressed by in-situ focus (see É.Kiss 1998 for the distinction between informational and identificational). A subject in Byali is always focused by means of an ex-situ strategy. Like in Ditammari, the focus constituent is followed by a focus marker in all cases.

[21]Reineke (2006b:163) claims that both Ditammari and Byali use syntactic, morphological and phonological reflexes of focus.

and Jaggar (2003) and Hartmann and Zimmermann (2007). (49a) with *fish* in situ and not followed by a focus marker is the answer to an informational question, whereas (49b) with the object fronted and followed by the focus marker *nee* is more natural in a correction situation. In Hausa, however, the focus marker *nee* is not obligatory in the case of the focus fronting illustrated in (49b).

(49)   Hausa (Chadic)
     a.   {What is Kande cooking?}
          ((Kandé tá-naa   dáfa   kíifíi$_F$)$_\phi$)$_\iota$
          Kande   3SG.F-IPF cooking fish
          'Kande is cooking (a) [fish]$_F$.'
     b.   {Kande is cooking meat.}
          ((Kíifíi$_F$ nee)$_\phi$ (Kandé tá-kee   dáfaawáa[22])$_\phi$)$_\iota$
          fish   FM.M Kande 3SG.F-IPF.REL cooking
          'It is (a) [fish]$_F$ that Kande is cooking.'

6.2.2 Focus marker to the left of the focus: Bole

Bole (West Chadic, Fiedler et al. 2010) inserts a focus marker to the left of a focus constituent, an obligatory operation with subject focus, and optional with non-subject focus. But here, a subject also has to move to the right edge of an ι-phrase. In Bole, thus, the object remains in situ and is optionally preceded by a particle; see (50a–b). The subject moves to the right and is obligatorily preceded by a particle; see (51).[23] The subject is now aligned at the right edge of an ι-phrase, like the object, and additionally, it is left-aligned with a ɸ-phrase. As mentioned by Fiedler et al. (2010) citing Schuh (2005), an interpretation of this particle as delimiting the given material to the right is also possible, which would account for the larger distribution of this particle as well as its different positioning as compared to the languages just described. Fiedler et al. (2010:255) show that an adverbial constituent can follow the focused subject, but in their example, this constituent is given and can thus be analyzed as outside of the main ι-phrase, as illustrated above with Chicheŵa and the Romance languages.

(50)   Bole (West Chadic)
     a.   New patient (SVO$_F$)
          {What is Lengi planting?}
          ((Léngì à   jìi kàppà mòrɗó$_F$)$_\phi$)$_\iota$
          Lengi AUX IPF planting millet
          'Lengi is planting [millet]$_F$.'

---

[22]Notice that left-dislocation of the object NP also has an influence on the shape of the verb, with *dáfaawáa* replacing the short form *dáfaa*.

[23]In Fiedler et al.'s account the position of the focus is motivated in the syntax: a focus targets the position immediately following the verb.

b.   New patient (SVO$_F$)
     {What is Lengi planting?}
     ((Léngì à   jìi kàppà)$_\phi$ (yé mòrɗó$_F$)$_\phi$)$_\iota$
     Lengi   AUX IPF planting FM millet
     'Lengi is planting [millet]$_F$.'

(51)   New agent (pseudo-cleft)
       {Who is planting the millet?}
       ((An jìi kàppà   mòrɗó)$_\phi$ (yé [Léngì]$_F$)$_\phi$)$_\iota$
       one IPF planting millet   PRT Lengi
       '[Lengi]$_F$ is planting millet.'

Bole is exceptional in another aspect: nearly all African languages allow their focus to appear in the form of a cleft, which is another form of alignment. Fiedler et al. (2010) claim that clefting a focused constituent adds emphasis, contrast, or exhaustivity. However, the Chadic languages Bole as well as Tangale are exceptions, as they obligatorily realize their non-subject focus in situ.

It has been proposed here that the focus marker can have a delimiting function, and that this function has to do with the preference of a focus to be aligned with a prosodic constituent. This analysis has to remain tentative at this point. More evidence in favor or disfavor of the role of a morpheme in indicating alignment is needed. The strongest argument in favor of this analysis is the subject/non-subject asymmetry. If the constituent in focus is perfectly aligned, then the focus marker can be absent in some languages, especially if it does not have any other function than that of marking a focus.

7 Discussion

It has been shown with different languages that the primary relationship between focus and prosody is best expressed in terms of alignment: focus is universally aligned with the right or left edge of a higher prosodic constituent. Some languages fulfill the requirement of alignment for their foci indirectly, by deaccenting the postnuclear material or by inserting a focus marker. After a summary of the properties and implications of the proposal in 7.1, two questions remain to be answered. The first one, answered in Sect. 7.2, addresses the need for a universal prosodic counterpart of focus and the second one, in Sect. 7.3, returns to the notion of prominence as an alternative to alignment.

7.1 Conspiracy in the fulfillment of alignment

The preceding sections showed that focus alignment provides a useful generalization of the prosodic behavior of focus. It was shown that an optimality-theoretic constraint, called ALIGN-FOCUS and formulated in (8), can account for focus alignment. This constraint is parameterized in two ways: right or left edge, and ϕ-phrase or ɩ-phrase, and these parameterizations form a family of constraints.

Languages achieve fulfillment of the constraint in different ways. Some of them just reorder the constituents, by scrambling or A-movement, so that the focused con-

stituent finds itself aligned with an ι-phrase. This is a strategy used by languages as diverse as Italian and Hungarian. Some other languages cannot just reorder their constituents in the main clause, but they still have enough syntactic freedom to be able to align a focused constituent with an ɸ-phrase, using a more radical syntactic change (for instance cleft of the focus constituent, or right-dislocation of given constituents, or A-bar-movement): we discussed French for this option, and predicate clefting and doubling were mentioned for Trinidad dialectal English, Haitian Creole and Gungbe. In some other cases, languages are content to enhance existing prosodic phrases to render them more audible or to create new prosodic boundaries to delimit foci. This was illustrated with Konkani, but other Indic languages also have this option at their disposal, as well as West Greenlandic (see Arnhold to appear), for instance. In a similar way, some languages simply insert a prosodic boundary after (or before) the focus. Chicheŵa and Japanese (not discussed in the paper) are such languages. They do so by using their own correlates of phrasing, penultimate lengthening in Chicheŵa and pitch reset in Japanese. Furthermore, some languages achieve indirect alignment by deaccenting postnuclear material. This is typical for German, Dutch and English. Greek also uses deaccenting, as do the majority of European languages. Another case of indirect alignment was illustrated with tone languages, like Fon, Ditammari, Hausa and Bole, which may add focus markers, preferably appearing at places where the focus is not well aligned. Focus markers may be absent in cases where focus is aligned, resulting in a subject/non-subject asymmetry in focus marking. Finally, deletion of given material, resulting in ellipsis, or short answers, is also a strategy that all languages use to align focus. We saw that focus is organized in a hierarchy of strength, and that a focus high on the hierarchy, like a correction or a contrast, may be accompanied by prosodic correlates more often than a simple information focus. In sum, a diversity of means to achieve focus alignment can be identified, as is typical in phonological conspiracy. In the present case, all these components of grammar are used to achieve a unique goal, namely prosodic focus alignment. Languages often have several methods at their disposal, another typical feature of conspiracies.

It must be kept in mind that fulfillment of alignment is just a preference for focus, and that its absence in specific utterances cannot be taken as falsification of the proposal here.[24] In Optimality Theory, absence of alignment can be obtained by higher-ranking constraints blocking the effect of ALIGN-FOCUS. It was shown with Basque that the need for prosodic alignment can be countered by constraints in syntax. More examples illustrating that morpho-syntax can be in the way of aligning a focus are easy to find, like the ban against clefting an adjective in French or pied-piping of a noun in Italian when the dependent numeral is focused. Restrictive constraints against word order changes are a main factor blocking alignment.

The discussion of the different languages was based on the assumption that the constraints in (8) are organized in two markedness hierarchies, as illustrated in (9). The constraint aligning a focus with an ɸ-phrase is always higher ranking than the one aligning it with a ɸ-phrase, when both refer to the same edge. This means that languages always seek to align their focus with the higher prosodic phrase, but when

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[24]In particular, the absence of a prosodic boundary after a focus constituent in lab speech with given word orders cannot be used to falsify the FA approach, which is designed for spontaneous or semi-spontaneous speech.

other parts of grammar are in the way, they may be satisfied with alignment with a ɸ-phrase.

Parameterization of focus alignment is asymmetrical in still another way. Right-alignment is more frequent than left-alignment. It was shown with German that deaccenting can take place postnuclearly, and this was analyzed as fulfilling right-alignment. In this way, the puzzling asymmetry between postnuclear deaccenting and the absence of prenuclear deaccenting finds a natural explanation. It can be asked whether there are symmetrical languages which seek alignment at the left and have prenuclear deaccenting but no postnuclear deaccenting. Hungarian is a good candidate since it aligns focus at the left of an ι-phrase. However, prenuclear deaccenting does not seem to occur. And in fact, one can even ask whether Hungarian is not a special kind of right-aligning language, with left-alignment only in the syntax, but right-alignment in the prosody, with generalized postnuclear deaccenting.

An important aspect of alignment is that when it is fulfilled by default, that is, when alignment of the focused constituent is obtained in the canonical order, it is often the case that nothing special happens in grammar. This may result in a subject/non-subject asymmetry: a non-subject is aligned in the unmarked word order, but a subject is not. The result is that a non-subject is the default case, while a subject needs some grammatical marking in order to satisfy alignment.

7.2 Prosodic counterpart of focus

In most contexts, the constituent in focus is evident from the background, which implies that it does not need to be grammatically marked, at least as far as casual conversations are concerned. If, in a conversation, one of the protagonists corrects a preceding proposition, it is immediately clear which part of the sentence is corrected. The same holds when the focus is the answer to a question. It has been shown extensively in this paper that when focus is aligned by default, it is very often the case that no extra grammatical marking is used, because none is needed. There is no re-ordering, no special morpheme, no enhancement or addition of prosodic boundaries. In the light of these remarks, the question arises as to whether it is in fact necessary to formulate a unique prosodic principle covering the numerous and extremely different strategies discussed above. As will be shown in detail in the next subsection, such a principle has been proposed in terms of prominence; however true phonetic prominence is often absent. Still, I think that the idea of a unique prosodic characterization of focus is a useful one.

If the definition of focus formulated in (3) is taken for granted, as it is here, nothing specifies that focus should be accompanied by any special prosodic property, and more particularly, nothing specifies that it should be highlighted in any way. (3) claims that focus introduces alternatives that are relevant for the discourse. In Rooth's (1985, 1992) model, however, pitch accenting a constituent in English indicates that this constituent is one element of a set of alternatives. The focus is the element which is 'highlighted' in the sentence. By contrast, a given element in the background does not elicit a set of alternatives. In the literature, some authors have proposed definitions of focus referring to highlighting of a constituent directly, without introducing the notion of alternatives. The general idea behind the notion of 'highlighting' is

that from a cognitive point of view, focus should be recognizable by the hearer and identified as being this new or contrasted or corrective element which the whole sentence is about. In the present paper, it is proposed that focus is sufficiently marked by prosodic alignment.[25] Aligning a focus and separating it from given constituents and from topics, serve the aim of separating the constituents in as many 'packages' to use a well-known concept. Aligning a focus introduces a boundary at its end or at its beginning and in this way, parts of discourse with different information structural roles are clearly separated from each other.

7.3 Alignment as prominence

The prosodic realization of focus is sometimes claimed to be a pitch accent. This interpretation of prominence has its origins in the study of English and other Western European languages, which often use pitch accent as a correlate of focus. Prominence is then understood as the highest pitch in its domain. This is accounted for by a focus prominence principle such as the one formulated in (52) from Zubizaretta (1998:38) (see also Chomsky 1971; Jackendoff 1972; Rooth 1985; Reinhart 1995 and Gussenhoven 2008, among others).

(52)   Focus Prosody Correspondence Principle
        The focused constituent (or F-marked constituent) of a phrase must contain the intonational nucleus of that phrase.

In another interpretation of prominence, assumed by Truckenbrodt (1995), Gussenhoven (2008:383) and Büring (2010) among others, prominence is not necessarily realized by pitch. (53) is the formulation of Büring (2010:178ff), inspired by Truckenbrodt's work.[26]

(53)   FocusProminence
        Focus needs to be maximally prominent.

Büring envisages prominence as equivalent to the head of a prosodic constituent, and he defines prominence in the following way: "By definition, the head of any constituent [...] is more prominent than any of its sisters (any other element within that constituent)." Constituents are prosodic domains like the ones proposed here, thus ɸ-phrases and ι-phrases, and a head is an abstract position in a metrical grid: it is the highest column in a metrical grid (see also Truckenbrodt 1995). Büring proposes that prominence is interpreted in different ways, depending on the language considered. For instance, in 'edge and boundary languages,' it is the edge position which is prominent. In languages with focus markers, the markers (morphemes) are prominent, and in languages with pitch accents, the accent is considered the most prominent

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[25]Alignment can be compared to the notion of 'given before new' from Clark and Haviland (1977), also proposed by Chafe (1976). Alignment replaces the uni-directionality intrinsic to this principle and replaces it with a more flexible property, namely the need to be at an edge of a prosodic constituent.

[26]We saw in (39) that Truckenbrodt requires 'highest prominence' for focus, but this does not refer to the highest F0 value.

marker. A syntactic position can also be prominent. As a result, prominence is devoid of prosodic content, and is defined as an abstraction on a prosodic structure. The head of a ɸ-phrase is either the rightmost or the leftmost word in a ɸ-phrase, e.g. "the head of pP [= ɸ-phrase, CF] in this language wants to align with the left/right edge of pP." Thus the head is aligned to the left or right edge of its ɸ-phrase, and prominence is equivalent with being the head of a ɸ-phrase.

It has also been assumed that the syntax defines intrinsically prominent positions, like the postverbal one in Aghem (Hyman and Polinsky 2010; Cheng and Downing 2011; Fiedler et al. 2010), the preverbal one in Hungarian (Szendrői 2003), the sentence-initial position in Hausa (Büring 2010) or the most embedded constituent in German (Cinque 1993).

As a consequence of such views, anything in the grammar can be prominent. A focus is necessarily the head of a prosodic constituent, and such a head is necessarily prominent. It does not make any difference whether a language expresses prosodic prominence with a pitch accent, duration, intensity, a special tone or with no correlate of prominence. Büring mentions some languages which do not mark focus at all, but in which focus is assumed to be prominent all the same. This interpretation of prominence is unavoidable if this notion has to be generalized to all languages. As has been demonstrated above, there are a considerable number of cases where focus has no prosodic realization except for alignment.

As has been demonstrated in this paper, many languages do not use prosodic prominence for focus, and even in languages which do, prominence is only needed if alignment is not fulfilled, or if focus is high on the scale in (6). Returning to the subject/non-subject asymmetry, it has sometimes been assumed that non-subjects are not marked for focus, whereas subjects are. In the FA approach, the evident conclusion is that alignment is fulfilled in non-subjects by default. In other words, non-subjects are perfect foci by themselves, but subjects, which are not aligned, are not. In the FP approach, by contrast, the subject/non-subject asymmetry is assumed to be related to some intrinsic prominence of non-subjects, as opposed to subjects, which are supposed to be non-prominent.

A further comparison between prominence and alignment concerns the universality of the two properties. It has been shown that prosodic prominence cannot be a universal property of focus, since many languages do not use accents. By contrast, phrasing is universal. Every language has prosodic phrases, and thus alignment. In some languages, phrasing and alignment are the unique correlates of focus, whereas other languages may add pitch accents, morphemes or syntactic operations.

In short, prominence is a necessary correlate of focus in languages using phonetic correlates to mark focus. However, it cannot replace alignment. It is thus necessary to keep these two notions distinct.

8 Conclusion

In this paper, a new, unified theory of prosodic focus realization has been proposed. It has been claimed that focus is preferably aligned prosodically with a higher prosodic constituent, and that prominence is a separate issue, which may be fulfilled as well,

but does not need to be. The preference for prosodic alignment can be satisfied by a number of different strategies affecting syntax, phonology and morphology. All languages seek to align their focused constituent with an intonation phrase, but higher constraints may block this alignment, as for example those militating against reordering of constituents. This insight allows the formulation of two universal markedness hierarchies, which were formulated in (9) and are repeated here.

(9)   Two markedness hierarchies
    a.   ALIGN-FOCUS R, ι-PHRASE R ≫ ALIGN-FOCUS R, ϕ-PHRASE R
    b.   ALIGN-FOCUS L, ι-PHRASE L ≫ ALIGN-FOCUS L, ϕ-PHRASE L

If a focus is higher on the strength hierarchy shown in (6), it is more prone to fulfill the alignment constraint than if it is lower on this hierarchy. Additionally, it is suggested that foci higher on the strength hierarchy are more often accompanied by additional phonetic correlates than foci lower on the hierarchy. This prediction has not been systematically tested in the present paper and must be investigated in future research.

It has been shown in the paper that the alignment proposal makes predictions that are easily verifiable in the grammar of languages because it relies on the coincidence of a syntactic and a prosodic position. As a result, it is always fulfilled in the same way.

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