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Prominence Beyond Prosody – A First Approximation

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Abstract

This paper sketches a framework for linguistic prominence applicable to prosodic and non-prosodic phenomena. It builds on the observation that there are important similarities between linguistic prominence and the essentially perceptual category of 'being in the current centre of attention'. Three properties seem to set linguistic prominence apart from other linguistic asymmetries. Firstly, linguistic units of equal rank (e.g. syllables, co-arguments of a predicate) compete for the status of being in the centre, and secondly, this status may shift depending on the context. Thirdly, prominent units function as structural attractors in their domain.

1. Introduction

The notion of prominence[1] is used in a wide range of linguistic subdisciplines, from phonetics to discourse studies. Our goal here is to explore the question of whether its uses in the syntactic, morphological and discourse domains can be shown to be systematically linked to its uses in phonetics and phonology, especially in the analysis of prosody. If this is the case, this notion may refer to a basic organizing principle in language, manifest in terms of form and function on all levels of language structure and language use.

The reason for choosing phonetics and phonology as a starting point for this exploration is the fact that this is the domain where "prominence" is most widely used and perhaps best understood. The most basic understanding here is the one used in auditory phonetics where "[p]rominence refers to the degree in which a phoneme, syllable, and/or word is perceived to stand out from its environment." (Streefkerk 2002: 6). Compare also handbook definitions such as: prominence is "[a] term used in auditory phonetics to refer to the degree to which a sound or syllable stands out from others in its environment" (Crystal 2008: 391) or "[the] property of a syllable which stands out from adjoining syllables" (Trask 1996: 291).

While these definitions concur in paraphrasing 'prominent' with 'standing out', there are non-trivial differences even in these very basic and short explications of the term. On the one hand, they vary with regard to the entity to which prominence is attributed: syllable (Trask), segment and syllable (Crystal), or segment, syllable and word (Streefkerk). In this paper, the syllable will be our main example, in line with the literature, i.e. whenever we refer to prosodic prominence without further specification, we have syllable prominence in mind.

On the other hand, the definitions differ in the degree to which they are explicit about the question of how prominence is tied to perceptual categories. This is explicit in Streefkerk's definition, implicit in Crystal's ("auditory phonetics"), and not at all clear in Trask's definition. In this regard, it is important to note that it is widely agreed in phonetics and phonology that there is not a single, specific acoustic property that renders a segment of the signal perceptually more prominent. Crystal (2008: 391) notes in this regard: "Variations in length, pitch, stress and inherent sonority are all factors which contribute to the relative prominence of a unit" (emphasis omitted). And according to Trask (1996: 291), syllables may stand out "by virtue of any of several phonetic characteristics, such as greater loudness, greater duration, higher or lower pitch, greater syllable weight, or greater excursion of the vocal tract from its neutral position" (emphasis omitted). Consequently, "prominence" is used as an abstract unifying category for a range of disparate acoustic phenomena.

As already hinted at above, in this exploration we investigate the feasibility of taking the abstraction already inherent in the phonetic notion of prominence a step further and evaluate its applicability for other levels of linguistic structure where acoustic properties of the speech signal do not play a role in characterising prominence. This is the case in syntax and semantics where "prominence" refers to the higher rank of an element on a hierarchy of semantic or syntactic entities. Well-known examples include the hierarchy of grammatical functions (subject > direct object > indirect object > …; cp. Keenan & Comrie 1977 and much subsequent work), the semantic role hierarchy (agent > experiencer … > theme/patient; cp. Lehmann et al. 2000, Bornkessel-Schlesewsky & Schlesewsky 2009, Lamers & de Swart 2012, Schumacher et al., in press) and the accessibility or givenness hierarchy (new > accessible > given, cp. Chafe 1976, 1994; Ariel 1990; Gundel et al. 1993).

Two interrelated questions arise with regard to such hierarchies in the current context: First, is the functional domain of prosodic prominence related to the position of elements on such hierarchies, i.e. is being higher on a semantic or syntactic hierarchy in any useful way comparable to "standing out from its environment" by virtue of acoustic properties? Second, what are the factors or properties on which these hierarchies are based, i.e. what are the formal equivalents of the acoustic properties which make something "stand out"? Originally, and in much of the literature, these hierarchies are used primarily as descriptive devices, allowing for generalizations of the kind "grammatical property X is confined to elements up to the third level of the hierarchy". The question of why there should be such hierarchies at all and which factors bring about prominence differences is rarely addressed.

Another non-prosodic phenomenon to which the label *prominence* is also occasionally applied is the distinction between head and dependent made in syntax and, more controversially, in morphology. Here the same type of questions arises as the ones just spelled out for the hierarchies discussed in the previous paragraphs: Can the difference between heads and dependents be usefully compared to prosodic prominence? And which features would be relevant in this regard? We will look at these questions more closely in section 3.

In principle, one could apply the notion of prominence to any kind of asymmetry in linguistic structure, and there probably are many other linguistic asymmetries which are occasionally discussed in terms of prominence differences. However, apart from the fact that it is not useful and potentially confusing to use the two terms – prominence and asymmetry – for the same phenomenon, we would hold that there is an intuition widely shared among linguists that not all types of asymmetries are prominence-related and that the applicability of this term can be usefully restricted to a set of asymmetries which share a number of pertinent features.

Our strategy for rendering this intuition more precise is as follows. We hypothesize that there is a correspondence between prominence-related linguistic structures and the psychological notion of attention. The precise nature of this correspondence is in need of further research. Clearly, however, linguistic prominence and (psychological) attention cannot be substituted for each other for the simple reason that linguistic structures are structures *sui generis* which are defined, inter alia, by their conventional character. That is, they evolve in complex processes where cognitive constraints and processes constitute but one of a number of differing factors (social and semiotic factors exemplifying other factor groups).

Still, the correspondence hypothesis leads us to expect that interactions between linguistic structures and cognitive states do occur in the domain of language processing and are demonstrable with neuro- and psycholinguistic methods. Furthmore, and more importantly for current purposes, the correspondence hypothesis suggests to us that insights from the research on attention can be of help in modeling and investigating linguistic prominence.

In section 2, we identify three characteristics– **the status of being in the centre, contextual shifting** and **structural attraction** – which apply to both attention and prosodic prominence. With regard to prosodic prominence, they allow us to unify the disparate acoustic properties of the speech signal that are widely used to characterize prosodic prominence (see quotes above). Furthermore, they can be applied as criteria for diagnosing prominence-related phenomena on other levels of linguistic structure. There are probably other traits – among them gradience – which are also of relevance in this regard. But for the

time being, we confine our discussion to these three points, as our primary goal here is the programmatic one of showing that this research strategy promises interesting results rather than attempting to present a fully worked-out theory of linguistic prominence.

In section 3, we will apply the three criteria to the head-dependent asymmetry and show that this asymmetry does not meet all of them. From this we conclude more generally that "prominence" cannot usefully be applied to every structural asymmetry in language. This concurs with the intuition that the asymmetries which can be usefully classified as involving a difference in prominence are only a subset of all linguistic asymmetries.

In section 4, we turn to the semantic role hierarchy as an example of the hierarchies mentioned above and show that the role hierarchy endorsed here indeed shares all the relevant traits of prosodic prominence, as identified in section 2.

In concluding these introductory remarks, note that the 'traits' or 'features' of prominence we use here are to be taken as heuristics. Lacking a general theory of prominence, this means, inter alia, that we cannot assess at this point whether they all have the same status and whether they are fully independent of each other.

2. Prosodic Prominence

2.1 A-Centre

The metaphor of "standing out" widely used in explicating the notion of prosodic prominence may refer to a multiplicity of properties. A syllable, for instance, may be said to "stand out" by bearing a pitch accent, a greater pitch excursion, a slower speech rate (lengthening), increased loudness (measured as intensity in db) compared to neighbouring syllables or simply by being the first or last syllable in a prosodically bounded phrase (cp. Gussenhoven 2011, inter alia).

As the prominence-lending properties are highly variable and dependent on contextually modulated interpretation, we need a unifying concept. In psychology, and cognitive sciences more generally, the core concept tied to perceptual salience is attention.[2] Hence, we will take a closer look at this notion in order to learn more about linguistic prominence.

This is not the place for an in-depth review of the literature on attention, but the following points are of major relevance for explicating the notion of linguistic prominence (cp., e.g., James 1890, for a ground-breaking early proposal, and Mole et al. 2011, Prinz 2012 for recent work). In his classic treatment of attention, William James offers the following introductory succinct characterization:

> Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one
> out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of

consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others (James 1890: 403-404).

The essence of attention is – in James' words – focalization or concentration of consciousness on one object or train of thought among several simultaneously possible ones. We call this trait 'attentional centering', the focused entity 'attentional centre' and the linguistic correspondent of the latter 'a-centre'. The notion of a-centering rests on our hypothesis that grammars have conventionalized means of organizing linguistic forms and functions in a way that interacts with attentional centering in language-related behaviour (cf. Griffin & Bock 2000, Papafragou et al. 2008).

Note that there is an important difference – which clearly limits the resemblance between attention and linguistic prominence – between attentional centres and a-centres. Attentional centres involve cognitive states of individuals that may change on a moment-by-moment basis. A-centres involve linguistic structures that are shared among all members of a speech community. Furthermore, if a given linguistic structure involves a-centering, this does not change on a moment-by-moment basis. In fact, this property cannot change unless the structure is specifically modified in this regard. This point is taken up again and exemplified in section 4.1.

Importantly for our purposes, James further makes the distinction between passive, involuntary or effortless, attention and active, or voluntary, attention. When perceived entities have a relatively high salience, be they "strange things, moving things, wild animals, bright things, pretty things, metallic things, words, blows, blood, etc., etc., etc." (James 1890: 418), attention can be deployed in a reflex-like fashion that is labelled "passive" (James 1890), "involuntary" (e.g. James 1980, Watzl 2011) or "stimulus-driven" (e.g. Corbetta & Shulman 2002, Bornkessel-Schlesewsky & Schumacher, submitted). By contrast, in the case of "active", "voluntary" or "goal-directed" attention, attention is directed in accordance with the observer's voluntary decision about what is currently most relevant.

Three points in this brief characterization are important for our argument. The first one pertains to the connection between perceptual salience, i.e. observable prominence-lending properties, and attention. Passive, i.e. stimulus-based, attention can be triggered by salience-lending properties of very different kinds, and it always depends on the actual context which property has an impact on the perceiver's attention. And active attention need not be driven by the most salient stimulus, which is obvious from the fact that attention can stay focused on a task (such as keeping track of a moving figure) in the presence of other highly salient stimuli in the environment (e.g. unusual noise). In short, the attentional centre is not

necessarily tied to a certain salience-lending property or to the most salient stimulus. Transferring these important insights to the linguistic domain, we argue that linguistic prominence is not tied to a specific set of phonetic properties but may result from a broad range of factors on different levels of linguistic structure.

The second, related point is that attention is guided by the observer's interest: "The things to which we attend are said to *interest* us. Our interest in them is supposed to be the *cause* of our attending" (James 1890: 417). If we transfer this to our investigation of prominence-related phenomena in linguistics, the question arises whether and if so, in what sense these phenomena are 'of interest to us'. We will make a specific suggestion in this regard for agent-prominence in section 4.

This brings us to our third point: attention selects between "what seem several simultaneously possible objects or trains of thought" (James 1890: 403, cf. larger quote above). Linguistically speaking, then, the selection process involved in a-centering presupposes simultaneously possible alternatives on the formal or functional level, i.e., entities forming an equivalence class for the status as current a-centre. Simplifying matters, we can say that a-centering involves a selection among equals. Thus, for example, prosodic prominence targets one syllable from a string of adjacent syllables, as further discussed in the next section.

A-centering and selection also take place on the functional level. There can be many different types of things that are of interest to us and grammars have conventionalized several of them. Linguistically speaking, this means that there is not only a single function (e.g. newness) that is of interest to us and thus vies for a-centering. It is an unresolved empirical question precisely to delimit the set of prominence-related functions and their interaction. Below, in section 4, we will argue that agentivity belongs into this set, but there are certainly a few more functions which we cannot discuss here. Further candidates include aboutness/tracking, i.e., keeping track of the referents which the unfolding discourse is about, and grounding, i.e., distinguishing backgrounded information from the main story line.

2.2 Context-Dependent Shift

A second major characteristic of prosodic prominence is the fact that it may shift in a context-dependent way. This is connected to the fact that prominence is essentially about asymmetries among elements of the same type. A syllable is perceived to be prominent relative to another syllable, not to a word or a segment. Being a relation between elements of the same type, prominence may shift in a context-dependent way. This is in line with our reconstruction of prominence in terms of centering. As mentioned above, attention singles "one out of what

seem several simultaneously possible objects" (see quote from James 1890 above) and may shift to another object according to the changing interest of the observer.

As widely known and discussed, intonational accents may shift in accordance with changes in the discourse context. For our purposes, we can leave details and finer-grained distinctions aside (cp. Baumann & Grice 2006) and simply talk about 'given' vs. 'new' information. Deaccenting for 'givenness' is illustrated in (1a), where the phrase *in the city* is given information due to that fact that it is a stand-in for *Toulouse.* The absence of a pitch accent on *city* causes the predicate *set foot* to have the last pitch accent. By contrast, in (1b), *in the city* is new information; it refers to the financial district in London, and therefore conveys different information from *London* (Gussenhoven 2011: 2798).

(1) a.   They can't have been seen in Toulouse. They NEVer set FOOT in the city .

   b.   They haven't really seen much of London. They NEVer set foot in the CITy.

In short, it is a central characteristic of prominent units to alternate or shift in accordance with the context. This trait reflects the dynamic nature of prominence asymmetries and sets them apart from other asymmetries among equals such as markedness or prototypicality. Thus, for example, the status of being the unmarked case, i.e., the nominative in most accusative languages (cf. e.g. Primus 1999), does not shift in a context-dependent way. Similar observations hold for prototypicality asymmetries between the members of a category.

2.3 Structural Attraction

Recent approaches to attention emphasise the structuring function of attention or, as Mole et al. succinctly put it (2011: xv), "attending is an organizational feature of experience". Centres of attention serve as anchors around which experience is organised. Linguistically speaking, we can say that prominent elements are structural attractors. By this we mean that larger domains, intonational phrases in languages with postlexical pitch accents, for instance, are formed by grouping less prominent elements around a prominent one. Thus, an intonational phrase typically contains at least one pitch accent, often referred to as the nuclear accent, to which other pitch accents may, but do not have to be, added.

This structuring capacity of prominent elements has two further manifestations. One is the fact that prominent elements tend to be aligned with the boundaries of the domains they constitute. The other is that prominent elements help identify how many units are comprised in the respective larger domain. Thus, for example, in languages with word stress, the number

of stressed syllables can be indicative of the number of words found in a given segment of continuous speech. In functional terms, one can say that prominent elements have secondary culminative and delimitative functions.[3]

The delimitative function of prominent elements is congenially fulfilled by their edge placement, a general manifestation of prominence that has been intensively studied in psychology for other purposes under the label of "serial position effect" since Ebbinghaus (1913). It refers to the fact that first and last elements in a series have a processing advantage over middle elements. In phonology, for example, as noted by Crystal (2008: 163) and Gussenhoven (2011: 2789), among others, final elements have salience independently of accentuation. If a speaker produces a nuclear accent on *WASn't* in *My phone number WASn't 712 345,* thus deaccenting all of the separately spoken digits, the digit *5* will be the most easily remembered digit, simply because it is last in the utterance. We will call this structural manifestation of prominence *edge placement* and will return to it in section 4.3 below.

To summarize this section, we have identified three characteristics of prosodic prominence which are abstract enough to be applicable to other levels of linguistic structure: a-centre, context-dependent shift, and structural attraction.

3. Is the Head-Dependent Asymmetry a Prominence Relation?
In syntax and morphology, the notion of prominence is sometimes used in discussing the distinction between heads and dependents, with heads being considered more prominent in some sense than dependents (e.g. Britton 1994: 653). However, as we will show in this section, this is not a viable extension of the notion of prominence as explicated in the preceding section.

With regard to the three characteristics of linguistic prominence established in the preceding section, it would appear that there is in particular one characteristic, i.e. structural attraction, that unequivocally also applies to the head-dependent asymmetry. Hierarchically structured syntactic phrases such as NPs, VPs, etc. are built around their heads or, in the terminology of X-bar theory, such phrases are projections of their lexical heads.

But in a similarly obvious way, it is clear that head-dependent asymmetries do not show the characteristic of context-dependent shifting. Syntactic heads may move from one head position to another, but within a given phrasal domain, a noun phrase for instance, the head will be the same noun irrespective of the way this noun phrase is used in a larger context. There is no head to phrase movement or phrase to head movement in morphology and syntax (originally formulated as the head movement constraint by Travis 1984: 131, cp., among

others, also Roberts 2001). Each phrase (or morphosyntactically complex unit) has a head that does not change in a context-dependent way.

This is related to the fact that head-dependent asymmetries mostly involve elements of different types, i.e. words and phrases in syntax, and roots and affixes in morphology (if this distinction is at all applicable in morphology, cp. Zwicky 1985). In the terminology of Zwicky (1993), the head of a syntactic phrase is necessarily of word rank (a noun in the case of a noun phrase, for example), but dependents mostly are of phrase rank (e.g., an adjective phrase or a genitive noun phrase as dependents of a noun). In derivational morphology, the head is an affix while the dependent is a stem (cp. Selkirk 1982 in terms of different X-bar theoretical 'ranks'). Only in compounding do we find configurations which are analysed in terms of head-dependent asymmetries where the elements involved are of equal rank. But since this clearly does not generalise to all kinds of head-dependent asymmetries, and in particular not to syntactic phrases – for many the prototypical exemplars of such asymmetries – we do not think that it is useful to apply the notion of prominence to this kind of asymmetry.

In passing, we may briefly note that it is far from clear whether the head in a head-dependent relation is an a-centre. While it may very well be possible to consider heads as centres of the phrases they form,[4] this would be a centre in the sense of being the central building block, i.e., our third characteristic. What is missing is the selection among equals which is a defining feature of a-centering. Hence, we conclude that the head-dependent relation is not a prominence relation in the sense we have defined it here. This is in line with most of the literature, where 'prominence' is used in reference to hierachies of elements of the same type, to which we now turn.

4. Prominence at the Syntax-Semantics Interface: Agentivity

As noted in the introduction, a widespread use of the notion of prominence in syntax and semantics is in reference to the rank of an element in a hierarchy such that an element which is higher on the hierarchy is said to be more prominent than an element that is lower on the hierarchy. We will call this type of prominence – in absence of a better term – *hierarchy-based prominence*. It has several subtypes relating to differing hierarchies, but we will limit ourselves here to the semantic role hierarchy, which, in our opinion, is a good testing ground for our prominence criteria in domains far beyond prosody. On the form side, we will focus on positional prominence, i.e., edge placement, rather than on morphosyntactic coding for reasons that will be mentioned further below.

Before we start our discussion of role prominence, let us present our view of semantic roles. From the fairly large range of approaches to semantic roles (cf. Levin & Rappaport-

Hovav 2005 for an overview), we adhere here to a multidimensional role concept, as argued for by many semanticists (e.g. Cruse 1973, Lakoff 1977, Dowty 1991, Haiden 2012). We will follow Dowty's (1991) line of research (cp. also Primus 1999, Ackerman & Moore 2001, Koenig & Davis 2006). Dowty defines two superordinate proto-roles, Proto-Agent and Proto-Patient, by bundles of entailments generated by the verb's meaning with respect to one of its arguments, but the concepts involved in these entailments can also be viewed as role features. The list of features that define Proto-Agent include volition, causation, sentience and autonomous movement. The most important features for Proto-Patient are causal affectedness and change of state. This type of multidimensional account allows for a large number of specific roles to be subsumed under a small set of general roles (in Dowty's approach only two). In particular, in this kind of approach the traditional roles of agent and patient are those specific roles that accumulate the highest number of consistent Proto-Agent and Proto-Patient features, respectively. This connection between traditional roles and proto-roles is important for our purposes, because much of the empirical evidence invoked in this section was compiled with the traditional roles of agent and patient in mind. Therefore, in the following sections we will follow common usage and use the terms *agent* and *patient*, but only for expository purposes. Where the different dimensions of agentivity play a role, we use the proto-role notions.

4.1 A-Centre

As mentioned in section 2.1, attention is guided by the observer's interest for an entity. This is an important aspect of attention, in William James' (1890) view the very cause of attending to an entity. As well-known from evolutionary psychology and linguistics, humans are generally attuned to agents as opposed to other roles and this could be due to basic evolutionary demands (cf. Leslie 1995, Spelke & Kinzler 2007, Alday et al. 2014, Schumacher et al., submitted). According to Leslie (1995: 121):

> Agents are a class of objects possessing sets of causal properties that distinguish them from other physical objects. My next assumption is that, as a result of evolution, we have become adapted to track these sets of properties and to efficiently learn to interpret the behaviour of these objects in specific ways.

In accordance with this assumption, it has been demonstrated that the human cognitive system appears to have developed a special sensitivity towards those natural objects that are potential agents, e.g. may move on their own, as opposed to other categories (New et al. 2007, Gelman 2009).

We hypothesize that this special sensitivity has become conventionalized in language in

that agents are universally more apt to be a-centres than patients. That is, agents are by default given more prominence in linguistic structures than participants in other roles.

This is a potentially controversial view as it contradicts the assumption occasionally found in the literature that agent-prominence is characteristic only of nominative-accusative languages while languages with different systems of alignment show other prominence relations. Specifically, it has been claimed that in ergative languages the patient outranks the agent on the role hierarchy (e.g. Dowty 1991, Van Valin & LaPolla 1997). However, we would hold that this claim rests on the unfounded view that ergative systems are mirror-images of nominative-accusative systems (see Mithun & Chafe 1999 for a thorough critique of this view). Instead, we follow Primus (1999, see also Du Bois 1985, 1987 and Mithun & Chafe 1999) in the assumption that systems of grammatical relations reflect a number of different factors of which position on the semantic role hierarchy – or, as we would rather have it, agent-prominence – is but one.

In investigating our hypothesis it will thus be important clearly to distinguish between the structures (or structural level) at which the hypothesized prominence relation holds (for example, argument structure) and the formal manifestations of the prominence relation (for example, in case marking, word order, control constructions, etc.), which typically are constrained by a number of differing factors, not all of which involve prominence relations.

The claim that agents are inherently and universally more apt to be a-centres implies that we find evidence for this inherent prominence of agents in all languages, regardless of their system(s) of morphosyntactic grammatical relation marking. The following discussion will provide examples showing that such evidence can indeed be found (see also Riesberg & Primus (in press) for additional evidence from symmetrical voice languages such as Totoli, Balinese and Tagalog). Because morphosyntactic coding is equivocal, as just mentioned, we will focus on evidence from positional prominence on the form side.

4.2 Context-Dependent Shift

As shown in section 2.2 for prosody, a second major characteristic of prominence is the fact that it may shift in a context-dependent way. This is connected to the fact that prominence is essentially about asymmetries among elements of the same type. In the semantic role domain, prominence may shift between the co-arguments of a predicate.

In the preceding section, we have argued that agents are inherently and universally more prominent than patients. Being inherent and universal, this basic configuration cannot shift. However, it is of course possible that on specific occasions roles other than agent may become the a-centre. For such cases, grammars have conventionalized specific formal means

of indicating this shift. This is exactly what one expects if role prominence is inherently prespecified. Typically, the agent expression loses its priviledged formal status in terms of word order or morphosyntactic realization, e.g. initial placement or core argument status, and the expression of the non-agent role functioning as current a-centre takes on some of these properties.

The perhaps most prototypical example for the kind of shift we have in mind here is the passive alternation. In passive clauses, the agent is demoted to an optional oblique syntactic function while another participant role, if present, is promoted to subject position (some languages, including German, also have passives formed of intransitive verbs where there is no promotion of a non-agent role to subject position). Let us look at the following examples from English where the optionality of the demoted agent is indicated by brackets:

(2)   a. *Misha closed the door.*
        b. *The door was closed (by Misha)*.

As illustrated by (2a, b), shifting the a-centre from agent to non-agent has to be accompanied by a change in structural position and/or morphosyntactic realization, since without any change in formal marking the agent will continue to be the a-centre due to its inherent semantics, as mentioned above.

Theoretical approaches such as Wunderlich's (1997) *Lexical Decomposition Grammar*, which dissociate the status of a role in terms of morphosyntactic realization (i.e. linking) from its conceptual semantic content, can represent the contextual shift under discussion in more precise terms. (3a, b) illustrates an analysis of the predicates in (2a, b) in this kind of approach:

(3)   a. $\lambda y \lambda x [\text{CAUSE}(x, \text{BECOME}(\text{SHUT}(y)))]$
        b. $\lambda y [\text{CAUSE}(x, \text{BECOME}(\text{SHUT}(y)))]$

Wunderlich splits the lexical representation of a predicate into two components. The first component, $\lambda y \lambda x$ in (3a) and λy in (3b), represents the theta-structure at the interface between syntax and lexical semantics. It contains lambda-bound variables which are associated with theta-roles and indicate the free arguments of a predicate. The second, more elaborate component (in square brackets in (3a, b)) is closer to conceptual semantics and contains semantic roles characterized in terms of primitive predicates such as CAUSE for agent-causation and BECOME for change of state. The relative embedding of semantic roles captures inherent agent prominence since agents are always the highest (= least embedded) arguments

in semantic structure. The hierarchy of semantic roles is mirrored in the ordering of theta-roles. The highest, most prominent theta-role for linking is the last one, occurring at the right edge of the theta-structure representation.

In our example (3a), the agent, the first argument x of CAUSE, is both the highest semantic role and the highest theta-role, which is linked to the highest syntactic argument position, i.e. subject position. This is the canonical linking for active clauses in accusative languages. By contrast, in the passive variant (3b) the agent, while still the highest semantic role, has lost its theta-role status so that it cannot be linked to a core syntactic argument (cf. Wunderlich 1997: 53). In this kind of approach, we can capture the idea that an agent, while retaining its inherent prominence in semantic structure may lose its status as the most prominent argument at the interface between semantics and syntax, i.e. in theta-structure.

4.3 Structural Attraction

As argued in section 2.3, prominent elements generally function as structural anchors or attractors for the structural domain they establish. For agents this amounts to the claim that they serve as a structural anchor for a complete predication domain.

Support for our claim that agents, Proto-Agents to be more precise, are structural anchors is provided by the fact that they determine the interpretation of the whole event. As is well known (cf. e.g. Dowty 1979), the properties of the Proto-Agent, i.e., the way this participant acts, may determine the event type of the whole predication. If the Proto-Agent is volitional, the event is an action (e.g. *Peter refrains from smoking; Peter is smoking*). If it is only autonomously moving, the event is a process (e.g., *The wind broke the window*). Finally, if it is sentient and neither volitional nor moving, the situation is a state (*Peter knows Mary*). In more general terms, the Proto-Agent can be said to determine the event type and the whole network of co-argument role relations within a complete predication domain.

Further support for our claim that agents are structural attractors is their preferred edge placement. As mentioned in section 2.3, edge placement is a formal prominence feature related to the structuring capacity of prominent elements. In general, the first and last elements in a domain are more salient than middle elements. However, in syntax and semantics there is compelling evidence that the initial position is the most salient one (cf., e.g., Gernsbacher & Hargreaves 1992). Here, we focus on the preference to place agents before all other roles or to interpret the first argument phrase as the agent in case of ambiguity. We will subsume both cases under the *Agent-First* preference.

Let us start with language acquisition and specifically with the acquisition of passive clauses. Passive clauses are particularly well suited to tease apart the Agent-First preference

from the Subject-First preference.[5] As shown above, in passive clauses the agent is demoted to an oblique syntactic function while another role is promoted to subject position. If children would follow the Subject-First strategy right from the beginning of the acquisition process, they would invariantly interpret the initial noun phrase in passives as the patient, even if the patient is animate. However, many experimental studies have revealed that animate first noun phrases in passive clauses such as *Scott* in *Scott was kissed (by Misha)* in many languages including ergative ones, are preferentially interpreted as agents (e.g. Hyams et al. 2006, Kirby 2010).

The Agent-First preference has also been detected in neurolinguistic experiments. There is compelling evidence obtained with various methods (including fMRI and event-related potentials) that a potential Proto-Agent in second position, presented as an animate second noun phrase, causes processing difficulties (e.g. Bornkessel-Schlesewsky & Schlesewsky 2009, Philipp et al. 2008, Alday et al. 2014 and the references mentioned there). Importantly, empirical findings from Chinese and Turkish support the assumption of an Agent-First rather than a Subject-First preference, since the test items rule out explanations based solely on formal subject features such as case or agreement. They further suggest that the Agent-First preference cannot be reduced to structural simplicity or frequency (see Wang et al. 2009 for a summary). The finding of an Agent-First preference even in ergative constructions (Hindi) further demonstrates the need to assume an Agent-First strategy independently of the way agents are coded morphosyntactically (cf. Alday et al. 2014). Schumacher at al. (submitted) also provide experimental evidence from pronoun resolution in German that Proto-Agent and subject are competing parameters of saliency.

It is also worth mentioning that the Agent-First preference shows up irrespective of the position of the verbal head (cf. Bornkessel-Schlesewsky & Schlesewsky 2009, Alday et al. 2014). This corroborates our assumption (cf. also Primus 1999, 2001) that the Agent-First preference is based on genuine prominence relations that only hold between co-arguments and not on the asymmetry between a head and its dependents.

Word order freezing is another phenomenon where Subject-First and Agent-First can be discriminated. It refers to the fact that in the absence of other clues (such as case, agreement, animacy, and context/intonation), it is the word order which straightforwardly determines the interpretation of verbal arguments in an ambiguous sentence (e.g. Lee 2003, Vogel 2004, Zeevat 2006, de Hoop & Lamers 2006). Let us exemplify word order freezing by examples from Fore:

(4) Word order freezing in Fore (Scott 1978: 102)

a. aragá   mási   áegúye

girl   boy   him/her-hit-she/he-INDIC

'The girl hit the boy.'

b. mási   aragá   áegúye

boy   girl   him/her-hit-she/he-INDIC

'The boy hit the girl.'

When co-arguments are of equal rank in animacy and there is no case distinction, the word order determines who is the agent and who the patient (cf. Scott 1978, Donohue & Donohue 1998). Therefore, despite the morphological ambiguity with respect to case and agreement, the sentences in (4a, b) cannot be interpreted as patient-initial. The more prominent element (agent) must precede the less prominent one (patient). The reverse order is unacceptable for unmarked noun phrases. Note that if there is differential case marking, for instance by a case marker on the agent (called *delineator* by Scott 1978), the reverse order is acceptable in Fore. Importantly, word order freezing leading to a patient-first interpretation, for instance in an ergative language, has not been found, to our knowledge.[6]

Finally, let us mention briefly some pertinent, but admittedly more equivocal typological word order findings (cf. Primus 2001 for details). As is well-known, in the overwhelming majority of languages, including ergative languages, the agent argument precedes all other co-arguments in basic order. The position of the verb does not influence this preference. Interestingly, among the few languages with basic patient-agent order (i.e. O before S order in word order typology), the order is never rigid, and ergative languages are statistically more dominant than average.

5. Conclusion

We have argued in this paper that the use of the notion of prominence for phenomena on different linguistic levels (phonetics/phonology, morphosyntax, semantics, discourse) is not a superficial coincidence, but may reflect a basic underlying organizational principle of linguistic structuring. We have identified three criteria for linguistic prominence. Firstly, linguistic structures on different levels are organised around a-centres, i.e. units that are selected from among other units of the same type to 'stand out' in relation to them. Secondly, a-centering is dynamic and may shift in the running discourse. It is particularly this dynamic trait that sets prominence asymmetries apart from other asymmetries such as markedness and

prototypicality. Thirdly, linguistically prominent units serve as structural anchors for their domain.

There are probably other characteristics (e.g. gradience) which also characterize linguistically prominent units but these are still in need of further exploration. Importantly, the set of characteristics of linguistically prominent units should converge in such a way that it allows for singling out a coherent set of asymmetries which instantiate the same basic underlying principle. That is, we have also argued here that not all linguistic asymmetries are prominence-related. Specifically, the head-dependent relation shares some, but not all, features with prominence-related asymmetries, and hence is best not regarded to belong to the set (cp. section 3).

The term "a-centre" reflects the fact that our explication of linguistic prominence builds on insights from research on the psychological notion of centre of attention. This is based on the hypothesis that linguistic structures that involve prominence relations can be shown to be conventionalisations of the selection and focusing processes that define attentional centering, and that, once conventionalized, linguistic prominence may influence attentional centering. Methodologically, this in turn implicates that ideally, it should be possible to show that these linguistic structures are indeed related in one way or another to attentional states of speakers and hearers when they are engaged in verbal behaviour.

However, it would be misleading not to distinguish very clearly between attention and linguistic structures because of the conventional character of the latter. Attentional states pertain to individuals and change on a moment-by-moment basis. Linguistic structures are shared by groups (speech communities) and constitute generalized routines for representing the world and for communicative interaction. Hence, we hypothesize that prominence-related structures conventionalize attentional defaults and that the overall system of prominence-related structures allows for cancelling out these defaults. We illustrated this idea in this paper with the example of agentivity: Agentive participants in events are inherently of greater interest to humans than non-agentive ones. Linguistic structures reflect this by universally privileging agentive arguments over non-agentive ones as a default in the linguistic expression of events (more technically, in argument structure). There are various ways of annulling this default, passive constructions being a prime example.

For reasons of space, we did not discuss the further "complication" that the defaults reflecting agent prominence vary across languages (but see Riesberg & Primus (in press) for some preliminary observations in this regard). In nominative-accusative languages, agents are per default associated with the syntactically most prominent function (i.e., the subject

function), but not all languages have such a syntactically most prominent position, and those that have it differ with respect to the factors that determine the linking between syntactic functions and semantic roles.

If this kind of reasoning is on the right track, further research will have to identify – and ideally also to motivate – the defaults conventionalised in prominence relations as well as the mechanisms for annulling such defaults (this is essentially our contextual-shift criterion). In the domain of prosodic prominence, higher pitch and longer duration would appear to be promising candidates for such defaults. The challenge here is to identify examples where higher pitch and/or longer duration are not associated with prominence/a-centering.

Future investigations will have to show how useful and productive the ideas sketched in this paper actually are. The proof will be a better understanding of the fairly heterogeneous set of phenomena brought together here under the label *linguistic prominence*. Furthermore, the core feature of being in the a-centre should be demonstrable by experimental methods for each phenomenon included in the set of prominence phenomena.

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Endnotes

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[2] In linguistics, the notion of centre (or focus) of attention has been used in discourse studies in particular in the *Centering Theory* for modelling coherence in discourse (cp., for example, Grosz & Sidner 1986, Gordon et al. 1993). Related concepts include *discourse salience* and Chafe's (1994) *focus of consciousness*. Much of what we say here is compatible with this literature, but the scope of phenomena we take into consideration is somewhat broader, as we are interested in the applicability of such a notion across different linguistic levels and domains. Considerations of space preclude a more rigorous discussion of these approaches here.

[3] The idea that linguistic elements may serve a culminative [Ger. *gipfelbildende*] and delimitative function can be traced back to Trubetzkoy (1967, cp. also Beckman 1986). A valuable insight of Trubetzkoy is that these two functions are non-compulsory and secondary (1967: 241f.), i.e., prominent elements usually serve another main purpose, the culminative and delimitative function being optional extras.

[4] Bloomfield (1933: 195f.), for example, uses *centre* for lexical heads in his classic discussion of endocentric phrases.

[5] There is abundant typological evidence for the Subject-First-Preference starting with the seminal work of Greenberg 1963, e.g. Primus 2001. There is also a bulk of psycholinguistic evidence from different languages, cf. Wang et al. 2009 for a more recent overview.

[6] As further discussed and exemplified in Vogel 2004, there are many other factors which contribute to the ambiguity of a given structure. In German, questions, for example, less rigorously rule out alternative interpretations with an undergoer in initial position (In *Welche Frau liebt Hans?* 'which woman loves John?' *welche Frau* may be either the experiencer or the stimulus).

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