Workshop July 12th,
Department of General Linguistics,
University of Freiburg

How much is too much? The one-new-idea constraint and related phenomena at the information-intonation interface

Programme

Date	Time	Location	Talk
11.07	4.30-5.30	Uniseum Freiburg Bertoldstr. 17	Guided Tour of *Zur Sprache Kommen: Forschung zu bedrohten Sprachen sichtbar gemacht*
	6-	Haus zur Lieben Hand Löwenstr. 16	HPCL Lecture: Schumacher The Future of Experimental Pragmatics
12.07	9.45-10	HS 1034 (KG I) Platz der Universität 3	Introduction
	10-10.45		Emmy Noether Group (Reinöhl et al.) “One new idea” constraint holds cross-linguistically even in serial verb constructions and flat nominal expressions
	10.45-11.30		Ozerov Beyond cognitive constraints: Interactional factors underlying the “one new idea” principle
	11.30-11.45		coffee break
	11.45-12.30		Peck Multiple predicates, multiple events? Testing the One New Idea constraint beyond non-hierarchical constructions
	12.30-2		Lunch
	2-2.45		Schnell & Linders Chafe’s one new idea at a time and uniform information density: A cross-linguistic computational study into the distribution of referential information
	2.45-3.30		Jacob How many ideas per sentence? Towards a "Grammar of Discrimination"

	3.30-3.45		coffee break
	3.45-4.30		Inbar et al. Empirical testing of intonation unit dynamics across diverse languages
	4.30-5.15		Reinöhl & Ellison The one-new-idea constraint and holistic language processing
	5.15-5.30		Closing
	6.30-8	Alte Wache Münsterplatz 38	Apéro
	8-	Rothaus Freiburg Bertoldstr. 17	Dinner
13.07	10-	Uniseum Freiburg Bertoldstr. 17	Guided Tour of *Zur Sprache Kommen: Forschung zu bedrohten Sprachen sichtbar gemacht* (English)

Book of Abstracts

“One new idea” constraint holds cross-linguistically even in serial verb constructions and flat nominal expressions

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In this talk, we test the hypothesis that spoken language is shaped by the “one new idea” constraint. Chafe (1994:42) proposes that human consciousness can only process at most one new idea at a time, where “at a time” means in one intonation unit. “Ideas” subsume mentions of entities, events or states, which are typically expressed by single content words such as nouns, adjectives or verbs. However, expressions with more than one content word have the potential to challenge Chafe’s constraint. We focus in this talk on such multi-word expressions which have already in the past been suspected of encoding more complex semantics than the average English NP or VP: serial verb constructions (Pawley 1987, 2009; Givón 1991), and similarly “flat” nominal expressions consisting of several co-ranked nominals (Louagie and Reinöhl 2022). We demonstrate that Chafe’s “one new idea” constraint holds for these expressions, based on an in-depth corpus study of four typologically-diverse languages and when differentiating between lexical and discourse activation.

To test the “one new idea” constraint, we examined 100 serial verb constructions in Kera’a (Trans-Himalayan, India) and Waima’a (Austronesian, Timor-Leste) and 100 flat nominal expressions in Sanskrit (Indo-Aryan, India) and Warlpiri (Pama-Nyungan, Australia) which occur within single intonation units. Each example was annotated on two levels: the activation status of the lexical items involved, as well as the activation status of the idea(s) involved in discourse. Lexical items and ideas are coded as ‘new’ if they appear for the first time in a recording or text, with subsequent activation of the same lexical item or idea receiving a number indicating the distance between activations in intonation units. We follow Riester and Baumann 2017 in assuming a five-intonation-unit cut-off for prior mentions of lexical items. Ideas are tracked without a cut-off point. Examples of coding can be seen in (1-4), where the “d-level” tracks discourse activation, and the “l-level” lexical activation.

Our investigation suggests that the “one new idea” constraint can be considered to be a universal principle of information packaging in a range of typologically-diverse languages. We find that the majority of examples include a maximum of a single new element, whether that be on the lexical item or discourse level. However, a number of examples involve more than one new element on either the lexical item level or discourse level (or both), posing a potential problem for the “one new idea” constraint. These challenges can largely be accounted for with reference to a number of phenomena that Chafe discusses (1994:110-119): independent activation (1), low-content elements (2), and collocations, lexicalisations, and idioms (3). The remaining challenges can be accounted for with reference to structures not found in English, but in the typologically-diverse languages investigated in this study, including near-synonym and generic-specific structures (4). As such, we find that the “one new idea” constraint holds but requires refinement through

careful separation of lexical and discourse-based activation. In addition, Chafe's account of potential challenges requires expansion to properly account for cross-linguistic and communicative diversity.

Examples

(1) Waima'a (Amandio_monkey.085)

	aku	*oo*	***'keti***	***hwaka***	***'keti***	***hwaka***
	1SG	also	jump	fly	jump	fly
d-level			new			
l-level			1-same	1-same	0-same	0-same

'I also jump'

(2) Sanskrit (adapted from ŚB 4.1.5.14)

	bahu	*mânuṣyêṣu*	***saṃsr̥ṣṭam***
	much.ACC.SG.N	human.LOC.PL.M	interaction.ACC.SG.N
d-level	new		
l-level	new		new

'(As healers, you sought) much contact amongst humans.'

(3) Kera'a (dogstory_104)

	ikrip	***to***	***a-ne***
	lie	speak	like_this-CV
d-level	new		
l-level	new	new	4-same

'(Ano) lied…'

(4) Warlpiri (j1-0028)

	walya-jarra	*=lpa*	*nyina-ja*	***yapa***	***nyurru-warnu-patu***
	ancestor	PST.IMPF	sit-PST	yapa	old_one-group-many
d-level	new				
l-level	new			new	new

'A long time ago the old people used to live (on that).'

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Beyond cognitive constraints: Interactional factors underlying the “one new idea” principle

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Intonation Units (IUs) were hypothesised to constitute processing units in previous research (Chafe 1994; Pawley and Syder 2000), and neurolinguistic research reveals indeed the connection between prosodic chunking and information processing (Inbar et al. 2023). Chafe’s “one new idea” constraint appears generally to be applicable to cross-linguistic data, revealing the limitations on the content of a single IU, and is one of a few additional related constraints: DuBois’ (2003) Preferred Argument Structure, Chafe’s (1994) “light subject constraint”, and Lambrecht’s (1994) PSRR (which limits the option of using a new topic and a focus within a single syntactic unit). While the proposed principles do coarsely grasp the tendencies of spoken language, they are known to be problematic empirically – due to infrequent but attested counter-examples, and theoretically – as there is no clear definition for such core notions as “number of ideas”, “semantic weight”, and “topicality”.

This contribution situates this problem within a broader drawback of the proposed constraints and principles, namely the premature linking of linguistic observations to cognition, while neglecting the crucial role of interaction in the shaping of linguistic units. The abovementioned principles are modeled exclusively on the observed linguistic facts, but are circularly used as cognitive models that provide cognitive explanations for the same linguistic observations. This premature link to cognition ignores the interactional aspects of communication and the interactional functions of linguistic units, often regarded in interactional approaches as “units of action” (Szczepek Reed and Raymond 2012).

Data from multimedia corpora of spontaneous interaction in three languages suggests that typical contents of an average IU fall short of actual limitations on the processing of linguistic data. Attested examples exhibit >1 clause/IU, >1 new argument/IU, complex syntactic structures combined with new referents, and richness of ideas expressed verbally and multimodally within a span of a single IU. However, not only are these options rarely exploited, but IUs are typically kept much shorter than expected “one idea”-style configurations. Case studies of differential case marking demonstrate that utterances which can be expressed within a single IU are nonetheless commonly partitioned into multiple IUs. Typically, this is done for interactional reasons related to recipience monitoring, attention centering, and incremental planning of global discourse. These findings lead to a hypothesis regarding interaction being the missing link between processing limitations and the observed size of the IU. While cognitive processing sets the upper limit for the amount of information/IU, the actual size of the IU remains substantially below this limit due to further factors related to local interactional moves and dynamic structuring of overall discourse.

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Multiple predicates, multiple events? Testing the One New Idea constraint beyond non-hierarchical constructions

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The flow of information in an interaction is argued to be constrained by how much our consciousness can focus upon at a single time, namely “One New Idea” (Chafe 1994). While we have good reason to believe this constraint holds in languages when ideas are expressed by hierarchical and non-hierarchical structures (cf. Reinöhl et al. this workshop), the primary focus in previous research has been on referential expressions or on specific morphosyntactic constructions. In this talk, I will present results from an in-depth corpus study looking at event-denoting expressions in three languages of the East Himalaya, with a particular focus on how multiple events can be realised in a single intonation unit.

Based upon how events are distributed with respect to intonation units and other types of information, I argue that we must posit two assumptions if the One New Idea constraint is to hold. Firstly, that the speaker expects the hearer to actively attend to ongoing morphosyntactic projects (in the sense of Auer 2005). Secondly, speakers anticipate that hearers create a mental model of the information transmitted in the ongoing discourse. Both assumptions echo previous work into language production (e.g. Pickering and Garrod 2013) as well as work on language processing (e.g. Zwaan and Radvansky 1998), suggesting that we can further refine what is understood by the notion of “consciousness” in Chafe’s theory of language and thought.

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Chafe's one new idea at a time and uniform information density: A cross-linguistic computational study into the distribution of referential information

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Chafe (1987, 1994:109) promoted the hypothesis of "one new idea at time", formulated by Givón (1975). While Chafe's hypothesis encompasses both predication- and reference-related information to count as "ideas" in relation to intonation units, subsequent work in the functionalist tradition, in particular DuBois (1987), has focussed entirely on referential information only, hence DuBois' "Avoid two new arguments per clause". A related idea is that of uniform information density which postulates that information (on any level of linguistic distribution) is spread evenly, showing "no peaks, no troughs" (Levy & Jäger 2008; Jäger 2010).

Despite some sporadic studies into these regularities of language production, typically drawing on single-language corpora, no larger-scale comparative corpus studies have materialised to date; our contribution is intended to fill this gap. We present results from statistical investigations of information distribution and information structure both locally on clause level and globally on discourse level in 19 corpora from typologically diverse languages included in the multilingual corpus Multi-CAST (Haig & Schnell 2021). Multi-CAST consists of spoken narrative sub-corpora from documentary corpora with annotations (GRAID, Haig & Schnell 2014; RefIND, Schiborr, Schnell, Thiele 2018) custom-tailored for research into the interface between morphosyntax and information packaging. A subset of eight corpora is also represented in DoReCo (Seifart et al 2022) and lends itself to investigations of the dynamic distribution of information in time.

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How many ideas per sentence? Towards a "Grammar of Discrimination"

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TBC

Empirical testing of intonation unit dynamics across diverse languages

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When people speak, their whole bodies participate in the action of communication. From voice production, through gesturing, thinking and reacting, we dynamically act in time. In the linguistic search for the components that make up these dynamics, Chafe (1979, 1987, 1994) and additional researchers suggested focusing on the prosodic structure of speech, on intonation units. These units are 'gestalt'-like production and perceptual components, which can be found in nearly any form of speaking. Moreover, researchers have suggested that intonation units pace new information during spontaneous communication. In this talk I will present recent developments towards testing this claim empirically in a wide variety of languages.

Auditory prosodic analysis is an arduous task that hinders the ability to research the pacing of information relative to intonation units. Automated segmentation algorithms exist, of various kinds, yet they tend to be validated relative to single, well-studied languages. We adopt a method that has previously been shown to detect prosodic phrase breaks in English (Suni et al., 2017). In addition to validating this method using recordings of spontaneous English speech (Englebretson et al., 2020), we test its performance in three additional languages: Russian (Kibrik et al., 2018), Hebrew (Jospe et al., 2020) and Totoli (Bardají et al., 2024). Performance in these languages varies – slightly less good in Hebrew and better in Russian and Totoli – however, it is comparable or even slightly better than reported metrics on inter-rater agreement between trained manual transcribers (e.g., Himmelmann et al., 2018).

In a next step, we apply this prosodic boundary detection method to segment a corpus of speech recordings in 44 additional languages, DoReCo (Seifart et al., 2022), an invaluable resource put forth by language documenters and typologists. We will present and make available the segmentation results, and an analysis of the detected prosodic phrases from an acoustic perspective as well as a temporal one. Specifically, Chafe (1987) suggested early on that intonation units begin approximately 1.5 seconds apart, and in a previous report we showed that this is the case in spontaneous speech in 6 languages from around the world (Inbar et al., 2020; Stehwien & Meyer, 2022). Here we extend this result and show that sequences of prosodic phrases as detected by our algorithm have a tempo of approximately 1 Hz in each of the nearly 50 languages that we studied.

Finally, I will discuss our findings in light of the neuroscientific research on rhythmically-structured brain activity (Lakatos et al., 2019; Obleser & Kayser, 2019), specifically at low-frequencies. This body of work suggests that low-frequency neural activity

underlies important cognitive functions like attention, memory, temporal prediction and motor control, and as such might provide the neurobiological basis for Chafe's hypothesized "one new idea constraint".

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The one-new-idea constraint and holistic language processing

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The level of holistic entrenchment of multi-word constructions, whether in the form of idioms or prefabs, is perhaps the single most relevant dimension bearing on the one-new-idea constraint and information density more generally (Reinöhl et al, in prep.). The reason is that, if a multi-word expression can be persuasively argued to have a single, holistic conceptual mental representation, then it can be understood as encoding one idea, rather than several, in the sense of Wallace's Chafe's one-new-idea constraint and related proposals. We approach in this talk the challenge of entrenchment, and holistic processing, from a hitherto understudied angle: Rather than focussing on idioms or prefabs, we discuss metaphorical functor-argument combinations (Reinöhl & Ellison 2024). These are constructions that consist of a functor (i.e. an unsaturated head, such as a verb with its argument slot(s)) and an argument that semantically clashes with the functor, thus yielding a metaphorical expression. Examples abound across languages; an English example is *to arrive at a conclusion*, where the abstract term *conclusion* forces a non-spatial interpretation of *to arrive*. We argue in this talk that such metaphorical functor-argument combinations, like idioms and prefabs, show evidence of holistic processing. This argument is supported by psycholinguistic evidence (sentence completion task; EEG study) as well as by corpus-linguistic data from a variety of unrelated languages. Our studies, in addition, reveal that metaphorical functor-argument constructions robustly suggest holistic processing largely independent of frequency effects.

Reinöhl, Uta, Maria Vollmer, Kirsten Culhane, Simon Fries & Naomi Peck. In prep. Serial Verbs and 'Flat' Nominal Expressions – Pushing the Boundaries of Information Packaging?

Reinöhl, Uta and Ellison, T. Mark. Metaphor forces argument overtness. 2024. *Linguistics* (online-first). https://doi.org/10.1515/ling-2021-0072