Semantics of metalinguistic focus

1 Introduction The guiding principle of compositional semantics is that the meaning of an expression is derivable from the composition of its *meaningful* subparts. Metalinguistic focus poses a glaring challenge to this guideline as it seems that *meaningless* parts of an expression also contribute to semantic composition.

Focus below the morphemic level Metalinguistic focus may operate at a sub-morphemic level, as in (1) (Artstein 2004). Here the stress is on the final syllable of *stalagmite*. Intuitively, only the syllable *mite* is focused. (1) can be true in the context that John brought home a stalagmite and a rock from the cave. This is because the alternative to *stalagmite* is restricted to a word which has a similar form, i.e., *stalactite*. Hence, (1) only entails that John didn't bring home a stalactite, but he might bring home anything else.

(1) John only brought home a stalag[míte]$_{\mathsf{F}}$ from the cave.

Note that focus licensing is based on meaning. Since morphemes are minimal meaningful units, focusing below the morphemic level means focusing on something meaningless. Hence, it is not clear that metalinguistic focus at the sub-morphemic level can be understood in terms of the existing theory of focus.

Focus without meaningful contrast Current theories of focus require the existence of at least one alternative that contrasts in meaning with the focused item. However, metalinguistic focus can be licensed without contrast in meaning, as exemplified by (2). Here Speaker A (perhaps a kid) made a mistake on the plural form of *goose*, and Speaker B (perhaps a strict parent) corrected him by focusing the correct form. Clearly, the meaning of *geese* is not the subject matter of the discussion, but the form is.

(2) A: Look! Some gooses are flying. B: No. Some [geese]$_{\mathsf{F}}$ are flying.

Since metalinguistic focus is generally taken to be a purely pragmatic phenomenon, few studies have tried to bring it under the scope of compositional focus semantics. An exception is Artstein (2004), who devise a special compositional rule turning a syllable into a meaningful unit, which only works for (1) and cannot be generalized to (2). This paper offers a novel approach to metalinguistic focus. I show that with insights borrowed from quotation semantics (Potts 2007; Sudo 2008; Maier 2014), as well as a generous use of (decomposed) LIFT, metalinguistic focus is no longer an outlandish phenomenon. Instead, it can be understood in terms of a canonical theory of focus.

2 Linguistic objects Based on quotation semantics, I present a model-theoretic treatment of linguistic objects. First, the type of linguistic objects u is added to the ontology. For simplicity I assume that the domain of linguistic objects D_u contains phonological strings of some language. This domain is closed under concatenation $\frown$, i.e., for any phonological string α and β, $\alpha \frown \beta$ is also a phonological string.

In addition, I define an operator $\ulcorner . \urcorner$ that takes a linguistic object u and returns a pair, as in (3). The first member of the pair is the semantic content that u is used to refer to, while the second member of the pair is a proposition, saying that the semantic content is expressed by u. $\ulcorner . \urcorner$ is akin to the quote-shift operator defined in Potts (2007) (cf. Koev 2017). For example, $\ulcorner \mathsf{geese} \urcorner$ denotes the pair $\langle \lambda x.^{*}\mathbf{g}(x), \mathbf{exp}(\lambda x.^{*}\mathbf{g}(x), \mathsf{geese}) \rangle$, whose type is $(e \to t) \times t$ (where "*" is Link's (1983) closure under sum, indicating plurality).

(3) $[\![\ulcorner \mathsf{u} \urcorner]\!] = \langle (\!|\mathsf{u}|\!)(c), \mathbf{exp}((\!|\mathsf{u}|\!)(c), \mathsf{u}) \rangle$ defined only if u is a meaningful string;

a. $(\!|\mathsf{u}|\!)(c)$ is the content that u is used to mean in utterance context c (also Shan 2010, Maier 2014).

b. $\mathbf{exp}((\!|\mathsf{u}|\!)(c), \mathsf{u}) :=$ $(\!|\mathsf{u}|\!)(c)$ is expressed by u

3 LIFT It has been assumed that LIFT, i.e., LIFT$x := \lambda f.f(x)$ is freely available (Partee 1986, Hendriks 1993, Barker 2002). Following Charlow's (2017) spirit, I propose to manage the pair-meaning of a linguistic object by decomposing LIFT into two operations, as in (4). On the left, $\mathbf{A}$ maps α of type a to a pair value of type $a \times t$ consisting of α and a tautology. On the right, $\uparrow$ turns a pair of type $a \times t$ into a scope taker of type $(a \to (b \times t)) \to (b \times t)$, for some b. The scope argument f is applied to α and returns a new pair of type $b \times t$ (also Giorgolo & Asudeh 2012; Koev 2017). **fst** and **snd** are functions projecting the first and the second member of a pair.

(4) $\mathbf{A}(\alpha) := \langle \alpha, \mathbf{T} \rangle \qquad \langle \alpha, p \rangle^{\uparrow} := \lambda f.\langle \mathbf{fst}(f(\alpha)), p \wedge \mathbf{snd}(f(\alpha)) \rangle$

For a sentence with a non-focused linguistic object such that *some* ***geese*** *is flying* (like mixed quotations, see Potts 2007, Maier 2014), using $\mathbf{A}$ and $\uparrow$ at LF can derive the result in (5).

(5) $[\![\ulcorner \mathsf{geese} \urcorner^{\uparrow}\ [1\ \mathbf{A}(\text{some } t_1 \text{ are flying})]]\!]^g = \langle \lambda x.{}^*\mathbf{g}(x), \mathbf{exp}(\lambda x.{}^*\mathbf{g}(x), \mathsf{g})\rangle^{\uparrow}(\lambda P.\mathbf{A}(\exists x.P(x) \wedge \mathbf{fly}(x)))$
$= \langle \lambda x.{}^*\mathbf{g}(x), \mathbf{exp}(\lambda x.{}^*\mathbf{g}(x), \mathsf{g})\rangle^{\uparrow}(\lambda P.\langle \exists x.P(x) \wedge \mathbf{fly}(x), \mathbf{T}\rangle)$
$= \langle \exists x.{}^*\mathbf{g}(x) \wedge \mathbf{fly}(x), \mathbf{exp}(\lambda x {}^*\mathbf{g}(x), \mathsf{g})\rangle$

Turning to focus, its interpretation can be modeled in a similar way. Using Charlow's (2014) implementation of Rooth's (1985) focus semantics, a focused phrase α_{F} is taken to denote a pair of type $a \times \{a\}$ consisting of its ordinary value and its focus value (alternatives). LIFT on focus is also decomposed into two operations, as in (6). $\mathbf{F}$ maps α (of type a) into a pair of α and a singleton set $\{\alpha\}$, replicating Roothian multi-dimensional denotation of a non-focused unit. $\Uparrow$ turns a pair m of type $a \times \{a\}$ into a scope taker of type $(a \to (b \times \{b\})) \to (b \times \{b\})$, for some b. The scope argument f is a function taking a type-a argument and returning a pair n. We combine the first members of m and n with regular functional application, and the second members with pointwise functional application.

(6) $\mathbf{F}(\alpha) := \langle \alpha, \{\alpha\}\rangle \qquad (\alpha, A)^{\Uparrow} := \lambda f.\langle \mathbf{fst}(f(\alpha)),\ \bigcup_{x' \in A}(\mathbf{snd}(f(x'))\rangle$

4 Derivation Combining LIFT on linguistic objects ($\uparrow$, $\mathbf{A}$) with LIFT on focus ($\Uparrow$, $\mathbf{F}$), we can derive (2B), as in (7). $\Uparrow$ is applied to $\mathsf{geese}_{\mathsf{F}}$, which takes scope by QR and leaves the trace t_1 of type u. This trace is operated by the operator $\ulcorner . \urcorner$, which generates a pair meaning. Applying $\uparrow$ to this meaning results in a linguistic object scope taker.

(7) $[\![\mathsf{geese}_{\mathsf{F}}^{\Uparrow}\ [1\ \mathbf{F}(\ulcorner \mathsf{t}_1 \urcorner^{\uparrow}\ [2\ \mathbf{A}(\text{some } t_2 \text{ are flying})])]]\!]$

$= \langle \mathsf{g}, \mathbf{alt}(\mathsf{g})\rangle^{\Uparrow}\left(\lambda u.\left\langle \begin{array}{l} \langle (\!|u|\!)(c), \mathbf{exp}((\!|u|\!)(c), u)\rangle^{\uparrow}(\lambda P.\langle \exists x.P(x) \wedge \mathbf{fly}(x), \mathbf{T}\rangle), \\ \{\langle (\!|u|\!)(c), \mathbf{exp}((\!|u|\!)(c), u)\rangle^{\uparrow}(\lambda P.\langle \exists x.P(x) \wedge \mathbf{fly}(x), \mathbf{T}\rangle)\} \end{array} \right\rangle\right)$

$= \left\langle \begin{array}{l} \langle \exists x.(\!|\mathsf{g}|\!)(c)(x) \wedge \mathbf{fly}(x), \mathbf{exp}((\!|\mathsf{g}|\!)(c), \mathsf{g})\rangle, \\ \{\langle \exists x.(\!|u|\!)(c)(x) \wedge \mathbf{fly}(x), \mathbf{exp}((\!|u|\!)(c), u)\rangle \mid u \in \mathbf{alt}(\mathsf{g})\} \end{array} \right\rangle = \left\langle \begin{array}{l} \text{Some } \ulcorner \mathsf{geese} \urcorner \text{ are flying}, \\ \{\text{Some } \ulcorner \mathsf{u} \urcorner \text{ are flying} \mid u \in \mathbf{alt}(\mathsf{geese})\} \end{array} \right\rangle$

The focus value can be neutralized via Rooth's (1992) $\sim C$. Based on (7), we can see that (2B) contrasts with (2A) on how the plural property $\lambda x.{}^*\mathbf{g}(x)$ is expressed.

The analysis can also capture (1) without stipulating a special word-level compositional rule (cf. Arstein's Phonological Decomposition, in which a non-focused syllable is a function taking a syllable and returning the meaning of a word). The prejacent of *only* is derived as in (8). The alternative set of 'stalag[míte]$_{\mathsf{F}}$' contains words with the *stalag* part. Hence, *stalactite* is in the set, but *rock* is not (the alternation of *stalag-stalac* is phonologically constrained). This is what underlies the intuition of (1).

(8) $[\![\mathsf{mite}_{\mathsf{F}}^{\Uparrow}\ [1\ \mathbf{F}(\ulcorner \mathsf{stalag}^\frown \mathsf{t}_1 \urcorner^{\uparrow}\ [2\ \mathbf{A}(\text{brought home a } t_2)])]]\!]$

$= \langle \mathsf{mite}, \mathbf{alt}(\mathsf{mite})\rangle^{\Uparrow}\left(\lambda u.\left\langle \begin{array}{l} \langle (\!|\mathsf{stalag}^\frown u|\!)(c), \mathbf{exp}((\!|\mathsf{stalag}^\frown u|\!)(c), \mathsf{stalag}^\frown u)\rangle^{\uparrow}(\lambda P.\langle \mathbf{brng\text{-}h\text{-}a\text{-}}P, \mathbf{T}\rangle), \\ \{\langle (\!|\mathsf{stalag}^\frown u|\!)(c), \mathbf{exp}((\!|\mathsf{stalag}^\frown u|\!)(c), \mathsf{stalag}^\frown u)\rangle^{\uparrow}(\lambda P.\langle \mathbf{brng\text{-}h\text{-}a\text{-}}P, \mathbf{T}\rangle)\} \end{array} \right\rangle\right)$

$= \left\langle \begin{array}{l} \langle \mathbf{brng\text{-}h\text{-}a\text{-}}(\!|\mathsf{stalag}^\frown \mathsf{mite}|\!)(c), \mathbf{exp}((\!|\mathsf{stalag}^\frown \mathsf{mite}|\!)(c), \mathsf{stalag}^\frown \mathsf{mite})\rangle, \\ \{\langle \mathbf{brng\text{-}h\text{-}a\text{-}}(\!|\mathsf{stalag}^\frown u|\!)(c), \mathbf{exp}((\!|\mathsf{stalag}^\frown u|\!)(c), \mathsf{stalag}^\frown u)\rangle \mid u \in \mathbf{alt}(\mathsf{mite})\} \end{array} \right\rangle$

With bi-dimensionality and decomposition of LIFT, both of which are independently motivated mechanisms, I have shown that metalinguistic focus can be understood in terms of compositional focus semantics.

4 Extension Combining the decomposed LIFT on linguistic objects with other different decompositions of LIFT yields various metalinguistic phenomena in language, like echo questions (Janda 1985), metalinguistic negation (Horn 1985), and quotation indefinites (Koev 2017). For example, consider echo questions, which are treated as metalinguistic questions (Janda 1985; Sudo 2010). In *Bill is a* WHAT-*dontist*, WHAT denotes a set of linguistic objects $\{u \mid u \in D_u \wedge u \text{ was possibly uttered before}\}$. In Charlow (2016), alternatives are composed with decomposing LIFT into $\Uparrow\Uparrow$ and $\mathbf{S}$, as in (9). Combining (4) and (9) yields the meaning of the echo question, as in (10).

(9) $\mathbf{S}(\alpha) := \{\alpha\} \qquad A^{\Uparrow\Uparrow} := \lambda f.\bigcup_{x \in A} f(x)$

(10) $[\![\text{WHAT}^{\Uparrow\Uparrow}\ [1\ \mathbf{S}(\ulcorner \mathsf{t}_1 {}^\frown \mathsf{dontist} \urcorner^{\uparrow}\ [2\ \mathbf{A}(\text{Bill is a } t_2)])]]\!]$

$= \{\langle (\!|u^\frown \mathsf{dontist}|\!)(c)(\mathbf{b}), \mathbf{exp}((\!|u^\frown \mathsf{dontist}|\!)(c), u^\frown \mathsf{dontist})\rangle \mid u \in D_u \wedge u \text{ is possibly uttered before}\}$

$= \{\text{Bill is a } \ulcorner u\ ^\frown \mathsf{dontist} \urcorner \mid u \in D_u \wedge u \text{ is possibly uttered before}\}$

Selective references **Arstein, R.** 2004. *NALS*. **Charlow, S.** 2014. NYU diss; 2016. *SALT* 25. **Giorgolo, G. & Asudeh A.** 2012. $\langle m, \eta, \star\rangle$ monads for conventional implicatures. *SuB 16*. **Potts, C**. 2007. The Dimensions of quotation, in *Direct Compositionality*.