



MOTIVATION

- Combinatory Categorial Grammar's (CCG; Steedman, 2000) **flexible treatment of word order and constituency** enable it to employ a **compact lexicon**
- This is an important factor in CCG's successful application to a range of NLP problems but can be **problematic** for linguistic phenomena where **linear order plays a crucial role**

CONCLUSION

The enhanced control over **evaluation order** afforded by Barker & Shan's Continuized CCG makes it possible to not only implement an improved analysis of **negative polarity items** in Dynamic Continuized CCG (White, Charlow, Needle & Bumford, 2017) but also to develop an accurate treatment of **balanced punctuation** (Nunberg, 1990; Briscoe, 1994)

DYNAMIC CONTINUIZED CCG AND NPI LICENSING

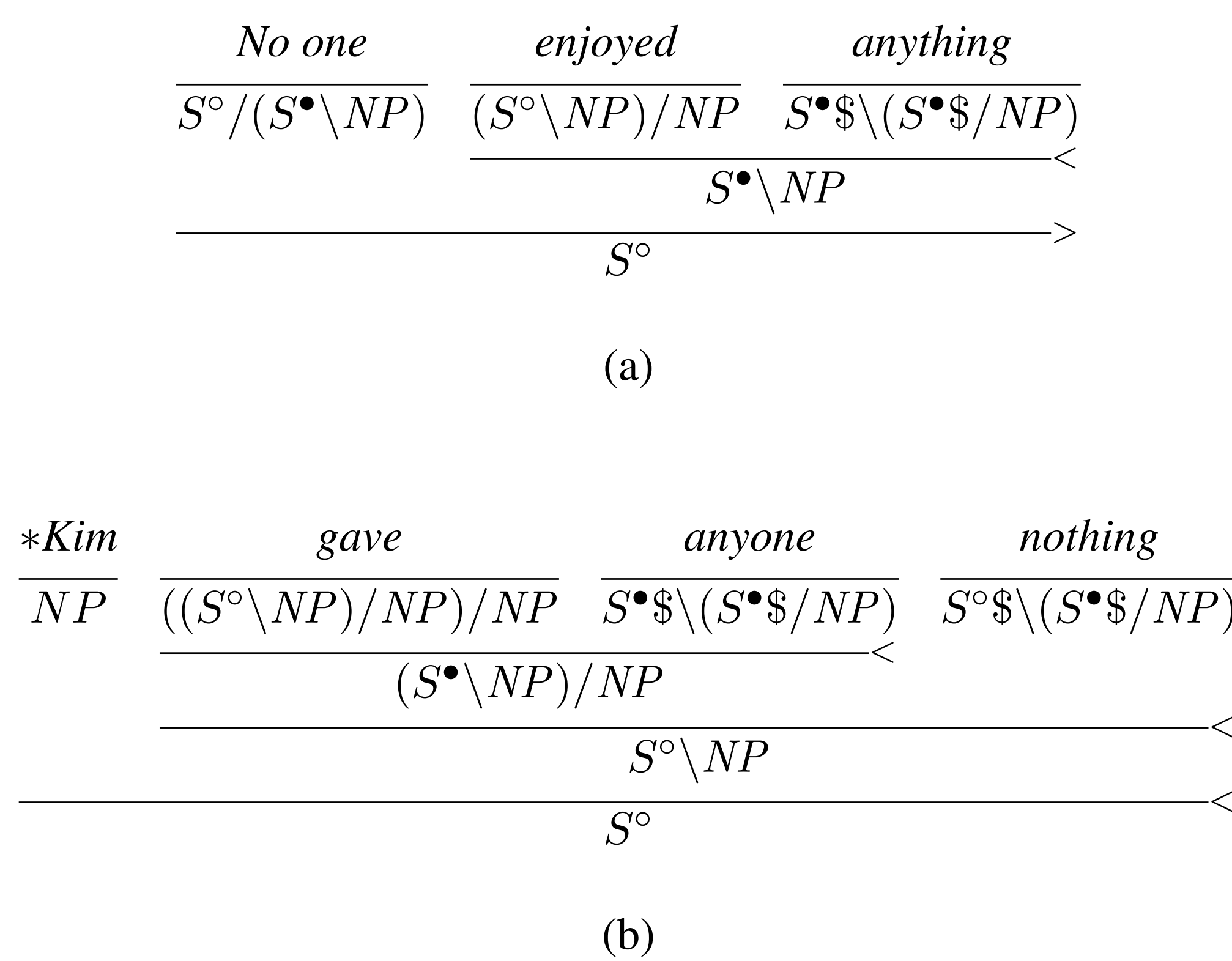


Figure 1: Negative Polarity Item Licensing in CCG

- CCG **fails to rule out** examples where the **licensor** of an NPI **follows** the NPI in a verb phrase (Fig. 1b)
- Barker & Shan's (2014)** account in Continuized CCG, using the tower top for licensing, **carries over straightforwardly** to the present framework
- Word order changes on the tower bottom are **unproblematic** (Fig. 4, right)

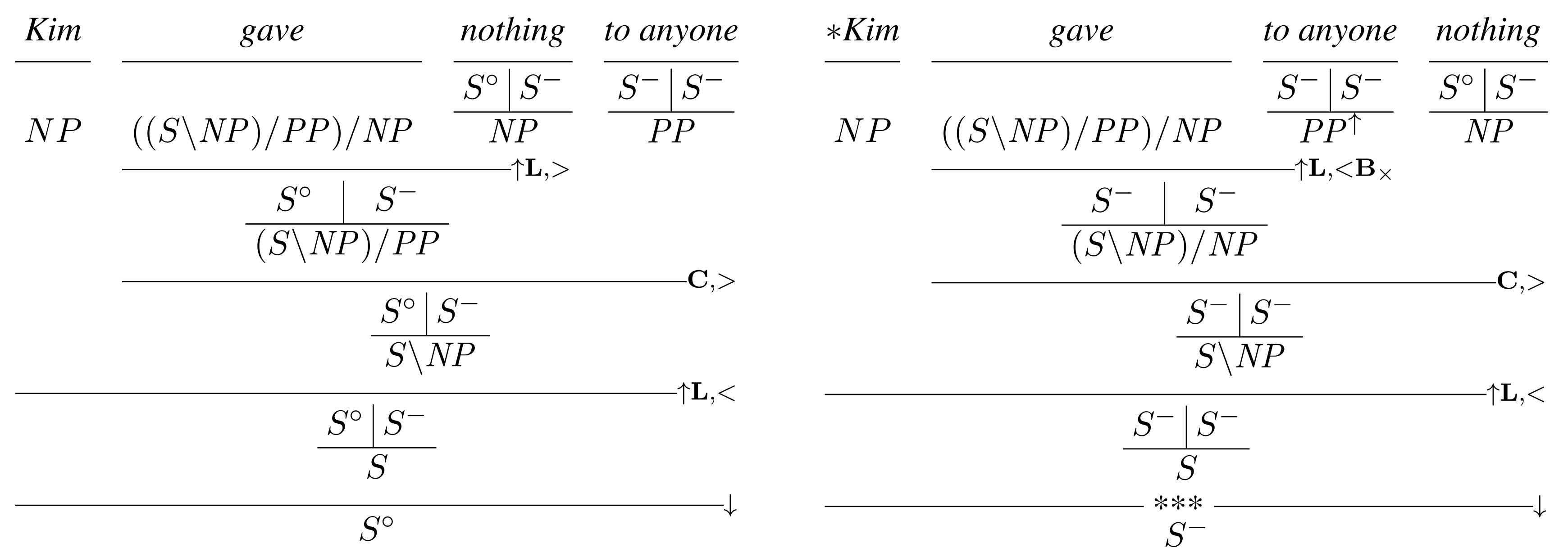


Figure 4: Word Order Flexibility and NPI Licensing

EVALUATION ORDER AND BALANCED PUNCTUATION

- Crossing composition makes it **impossible** for CCG to **accurately track** balanced punctuation on the **right periphery** (Fig. 6; White & Rajkumar, 2008)
- With Dynamic Continuized CCG, the **tower top** can be successfully used for this purpose (3), and word order changes on the tower bottom are **unproblematic** (Fig. 8)

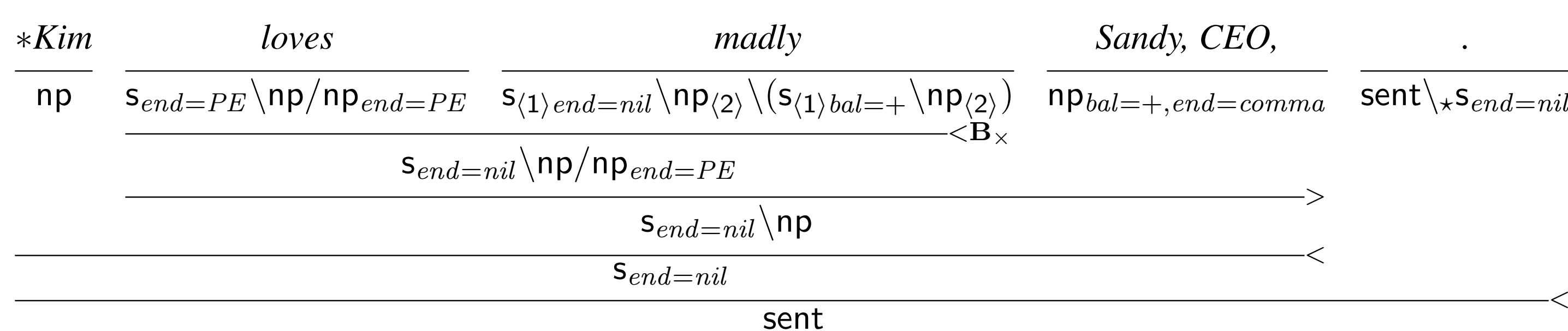


Figure 6: Crossing Composition and End Punctuation Tracking Issue in CCG

(3) a. , $\vdash \frac{S \backslash S_{nil}}{NP} \backslash \frac{S^{bal} \backslash S_{nil}^{unbal}}{NP} / \frac{S \backslash S_{nil}}{NP_{pred}}$

b. , $\vdash \frac{S \backslash S_{nil}}{NP} \backslash \frac{S^{bal} \backslash S_{comma}^{bal}}{NP} / P_{comma} / \frac{S \backslash S_{nil}}{NP_{pred}}$

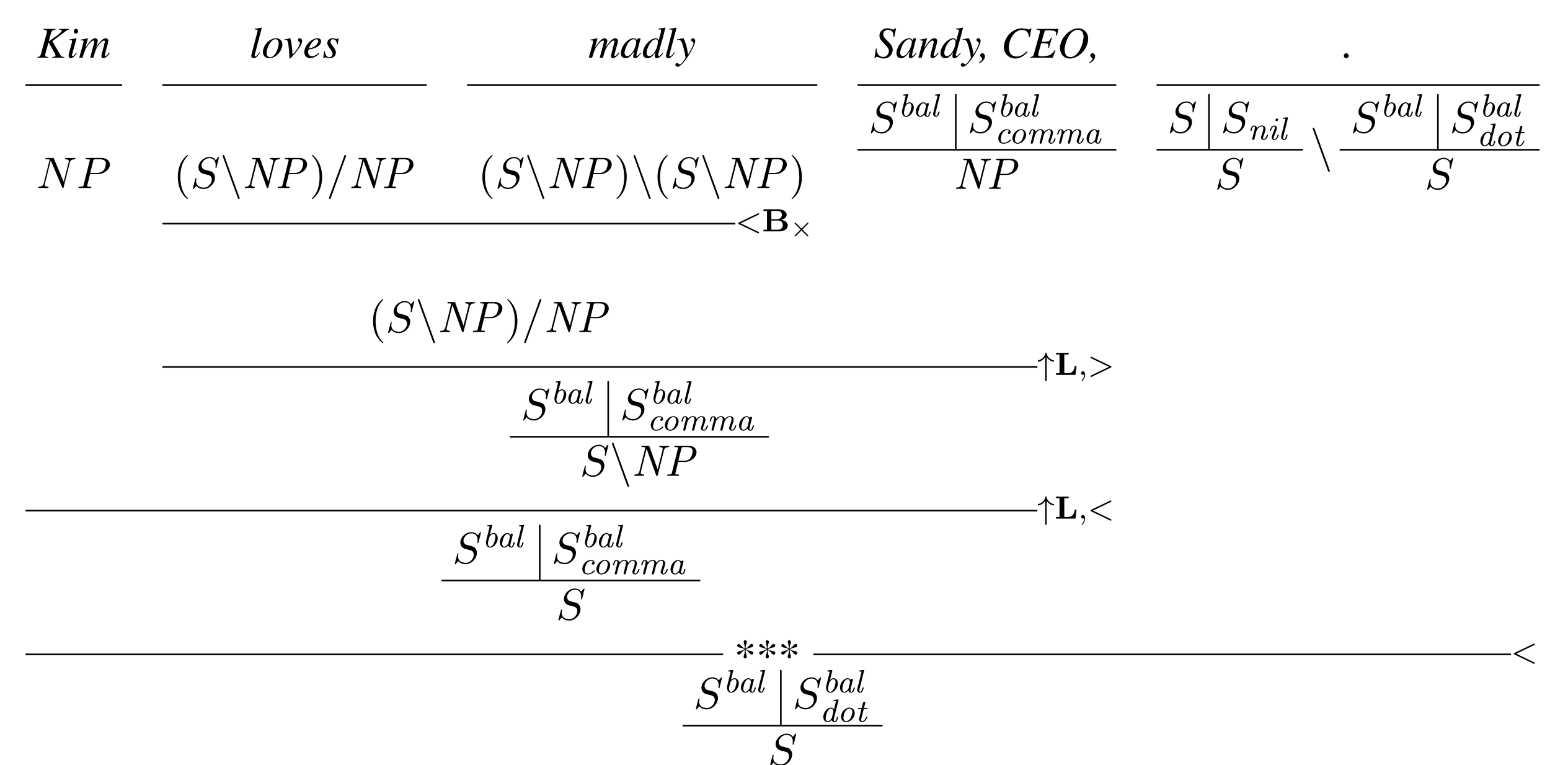


Figure 8: Right Edge Tracking through Crossing Composition in Dynamic Continuized CCG

MONADIC SEMANTICS FOR APPOSITIVES

(5) State.Set Monad

$$\begin{aligned} M\alpha &= s \rightarrow \alpha \times s \rightarrow t \\ a^n &= \lambda s. \{ \langle a, s \rangle \} \\ m_v \multimap \pi &= \lambda s. \bigcup_{\langle a, s' \rangle \in m_s} \pi[a/v]s' \end{aligned}$$

- Monadic sequencing straightforwardly allows **multiple predications** for NPs with appositives (cf. Martin, 2016)

(6) a. , CEO of XYZ, $\vdash \lambda k'k.k' \lambda xs. \{ \langle x, s \rangle \mid \text{ceo}(x, \text{xyz}) \}_y \multimap ky$

b. Sandy, CEO of XYZ, $\vdash \lambda ks. \{ \langle \text{sandy}, s \rangle \mid \text{ceo}(\text{sandy}, \text{xyz}) \}_y \multimap ky$

ACKNOWLEDGMENTS