# Ling 566
# Oct 17, 2019

## Review

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# Overview

- Homework tips
- Common mistakes
- Analogies to other systems you might know
- Open questions



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# Homework tips/requests

- Type whenever possible
  - (no photos of whiteboards)
- Answer each part of each question separately
- Be sure to answer each part of each question, and follow the directions!
- Look over the problems early and ask questions
- Check your work
- Monitor Canvas discussions
- WORK TOGETHER



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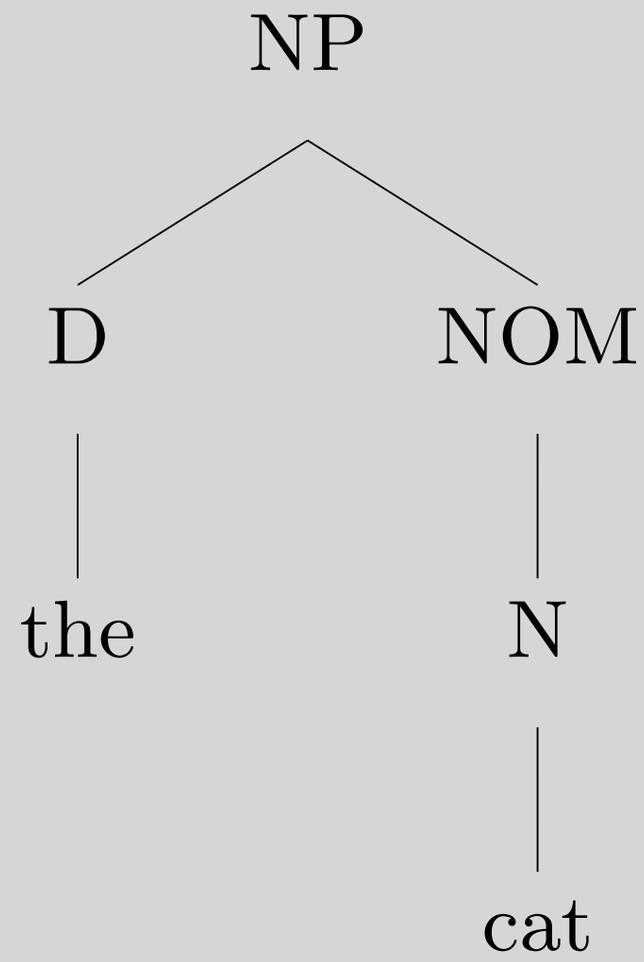
# Which grammar does this tree go with?



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# What's wrong with this?

$$\left\langle \text{out}, \left[\begin{array}{ll} \textit{word} & \\ \text{HEAD} & \textit{prep} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\ \text{VP}\ \rangle \\ \text{COMPS} & \langle\ (\text{PP} \mid \text{NP})\ \rangle \end{array}\right] \end{array}\right] \right\rangle$$



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# What's wrong with this?

$$\left\langle \text{out}, \left[\begin{array}{ll} \textit{word} & \\ \text{HEAD} & \textit{prep} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ (\text{NP})\ (\text{PP})\ \rangle \end{array}\right] \end{array}\right] \right\rangle$$



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# What's wrong with this?

$$\left\langle \text{out}, \left[\begin{array}{ll} \textit{word} & \\ \text{HEAD} & \textit{prep} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & (\ \text{NP} \mid \text{PP}\ ) \end{array}\right] \end{array}\right] \right\rangle$$



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# What's wrong with this?

$$\left\langle \text{grew}, \begin{bmatrix} \textit{word} \\ \text{HEAD} \begin{bmatrix} \textit{verb} \\ \text{AGR} \quad \textit{3sing} \end{bmatrix} \\ \text{VAL} \begin{bmatrix} \text{SPR} \quad \langle\ \text{NP}\ \rangle \\ \text{COMPS} \quad \langle\ \text{AP}\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$



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# What's wrong with this?

$$\left\langle \text{out}, \left[\begin{array}{ll} \textit{word} & \\ \text{HEAD} & \textit{preposition} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ (\ \text{NP} \mid \text{PP}\ )\ \rangle \end{array}\right] \end{array}\right] \right\rangle$$



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# What's wrong with this?

$$\left\langle \text{there}, \begin{bmatrix} phrase & \\ \text{HEAD} & prep \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$



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# Tags & lists

- What's the difference between these two?

$$\left[\text{SPR} \quad \boxed{1}\langle\ \text{NP}\ \rangle\right]$$

$$\left[\text{SPR} \quad \langle\ \boxed{1}\text{NP}\ \rangle\right]$$

- When does it matter?



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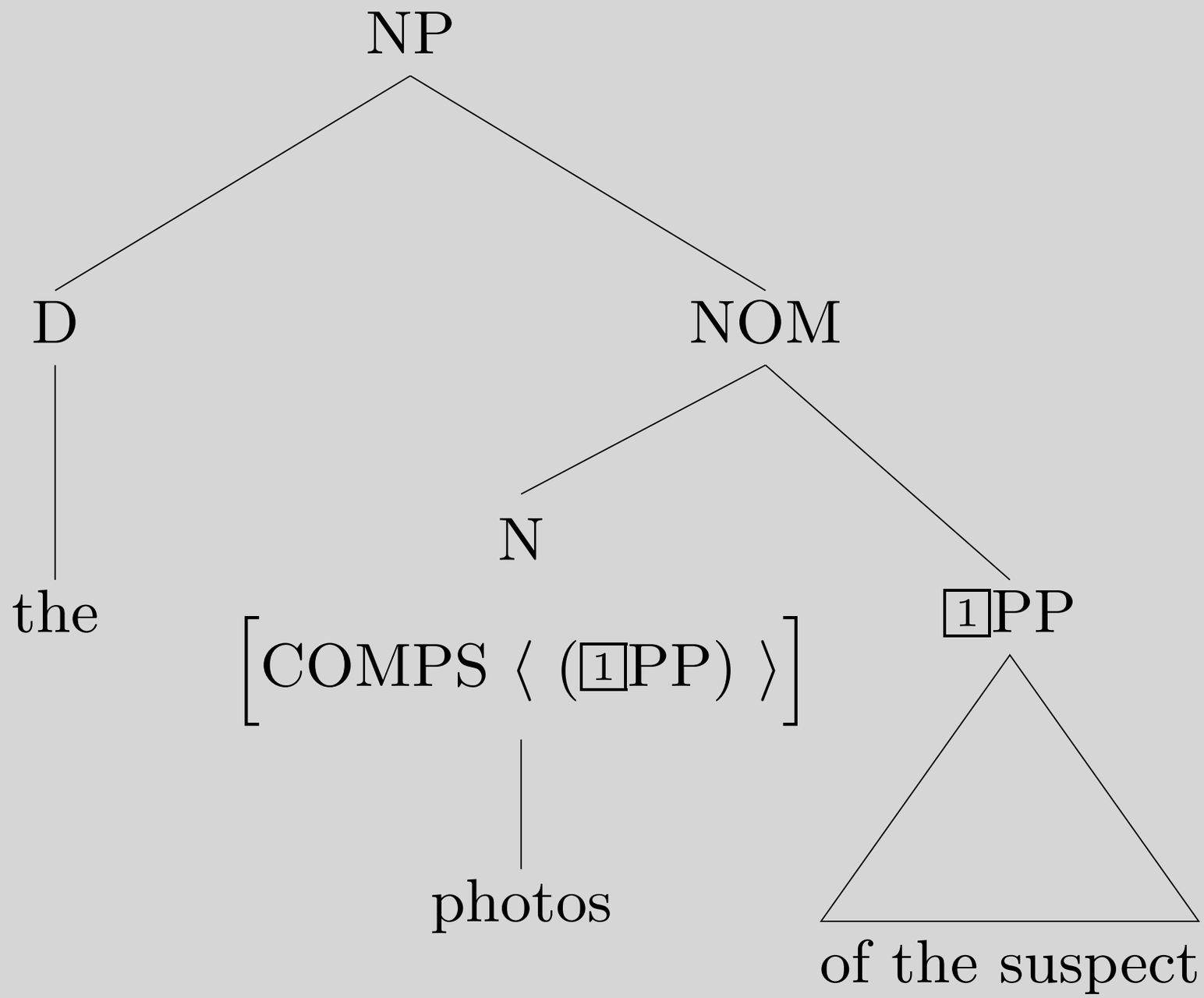
# What's wrong with this tree?



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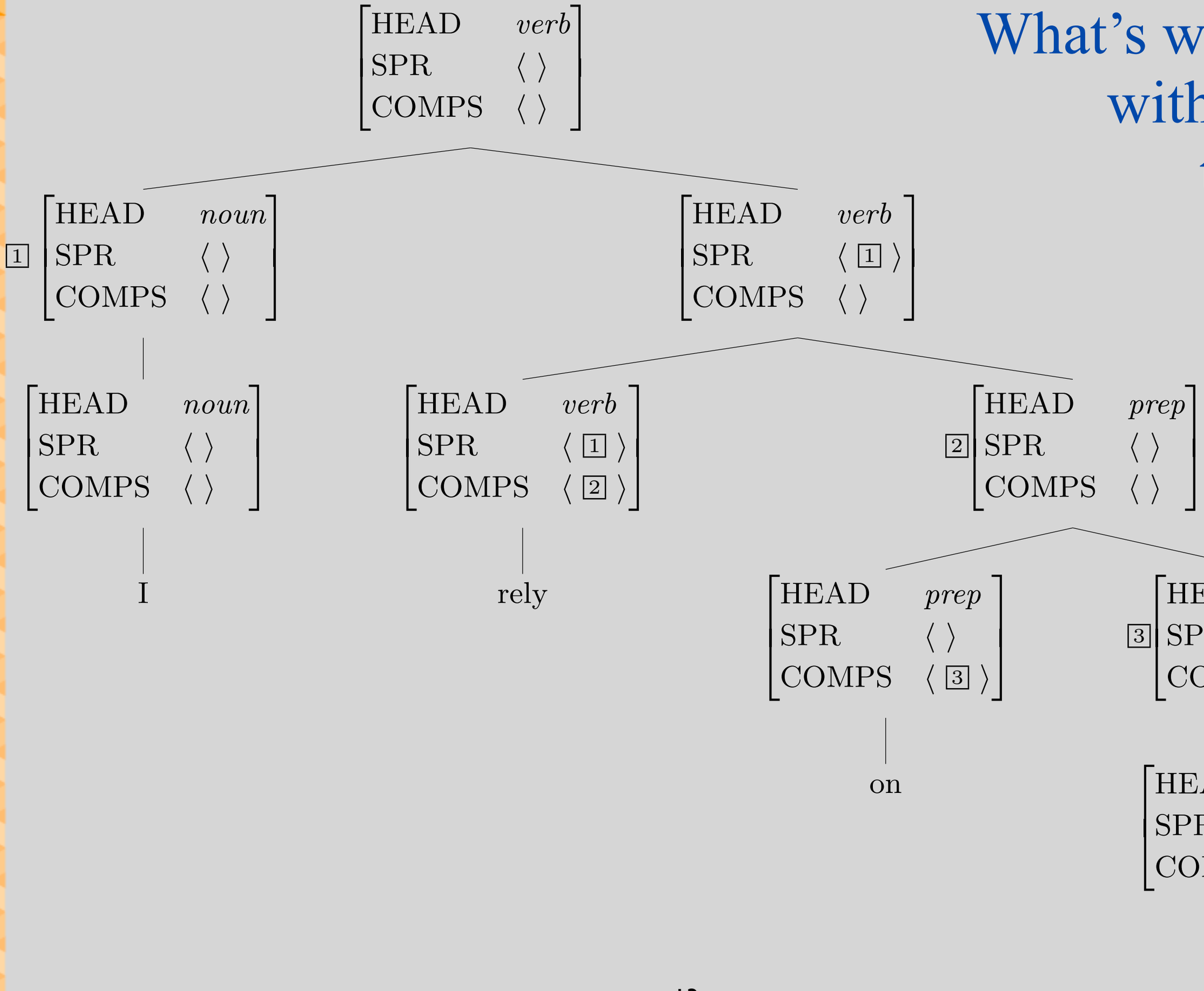




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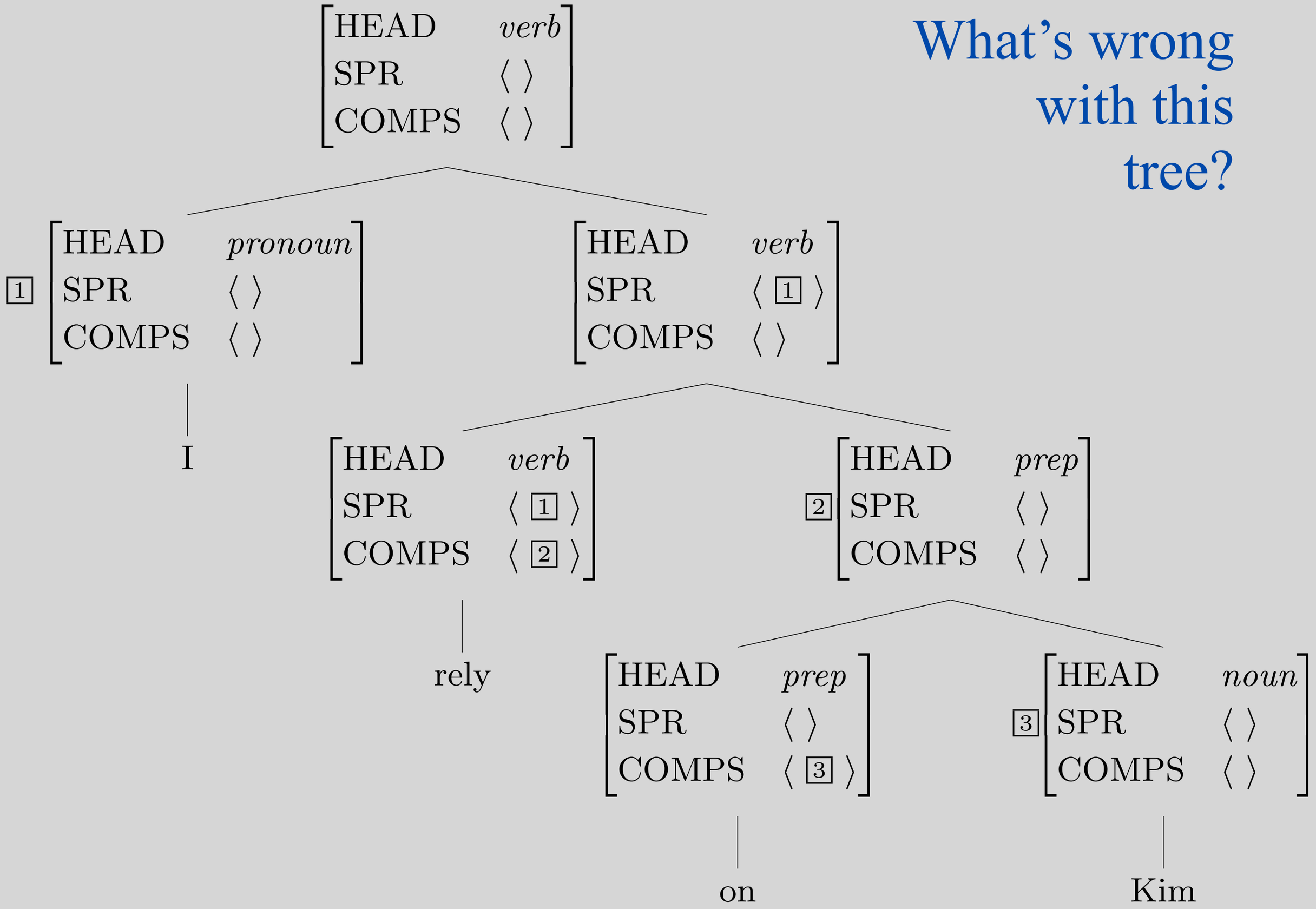




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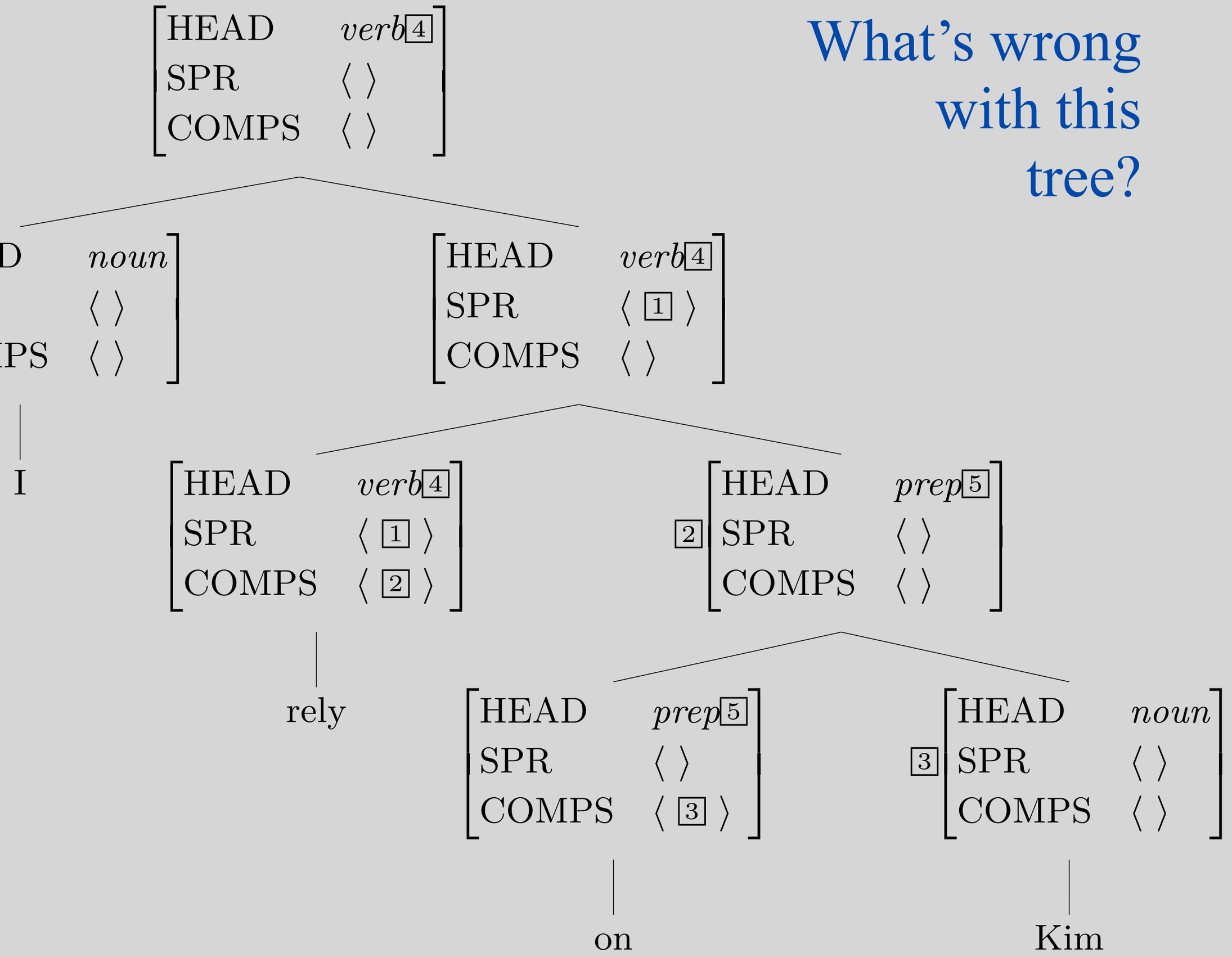




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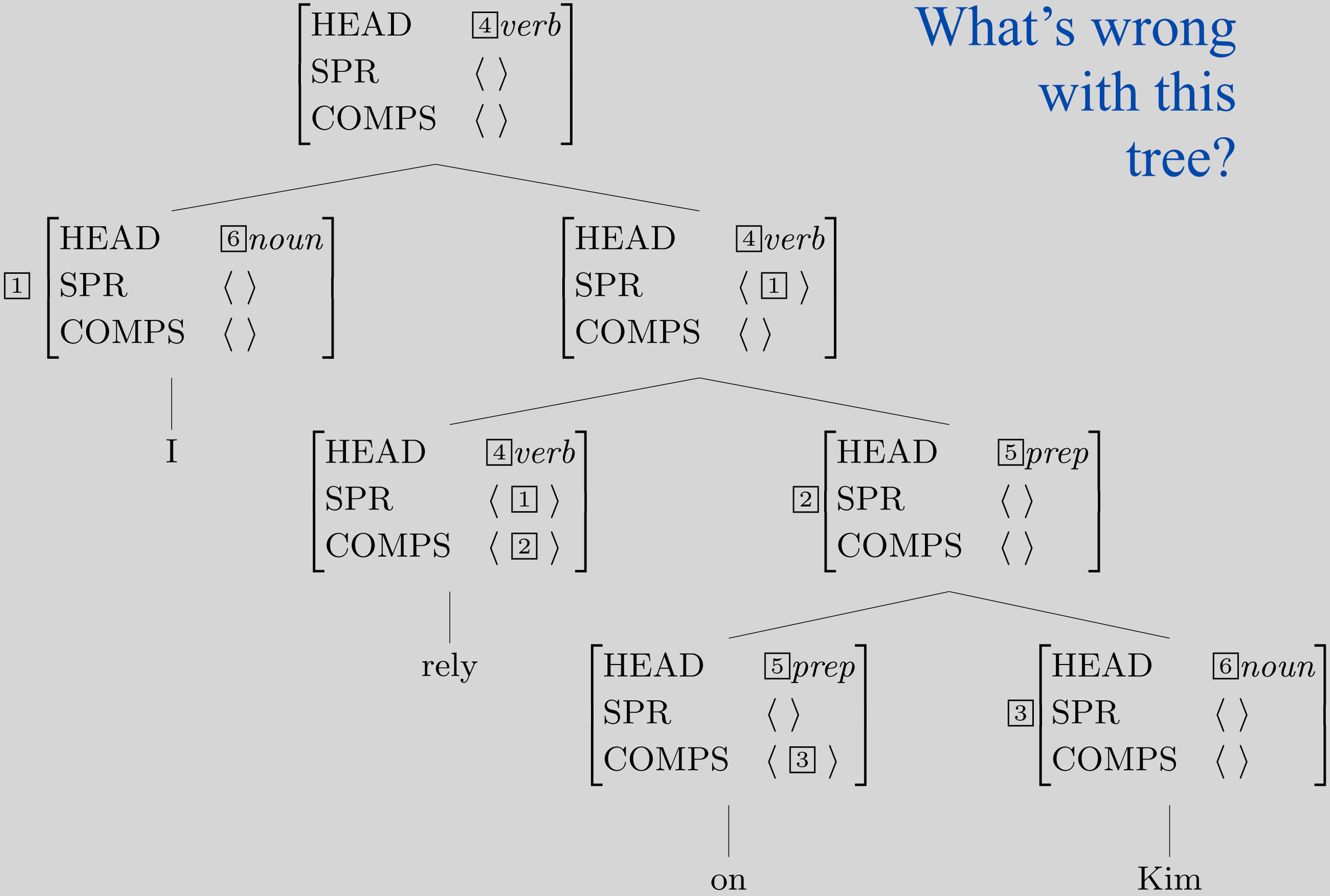




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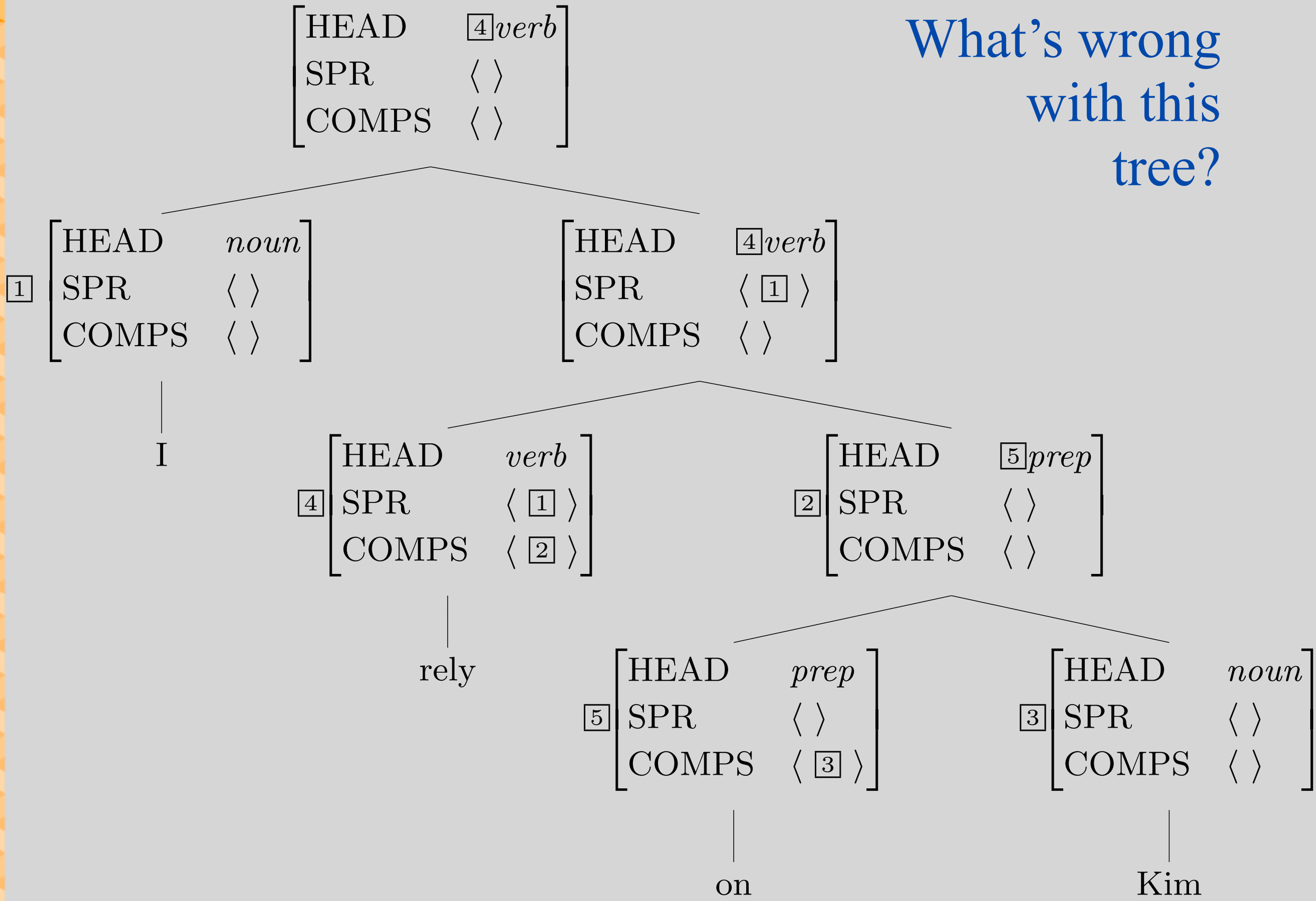




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# What's wrong with this?

$$\left\langle \text{hundred} \;,\; \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{number} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \begin{bmatrix} \text{HEAD} & \textit{number} \\ \text{INDEX} & j \end{bmatrix} \rangle \\ \text{COMPS} & \langle \begin{bmatrix} \text{HEAD} & \textit{number} \\ \text{INDEX} & k \end{bmatrix} \rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & m \\ \text{MODE} & \textit{ref} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textit{hund-number} \\ \text{MULTIPLIER} & j \\ \text{ADDEND} & k \\ \text{HUND-VALUE} & m \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$



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# And this?

$$\left\langle \text{hundred}\ , \left[\begin{array}{ll}
\text{SYN} & \left[\begin{array}{ll}
\text{HEAD} & number \\
\text{VAL} & \left[\begin{array}{lll}
\text{SPR} & \langle & \left[\text{HEAD}\quad number\right]\rangle \\
\text{COMPS} & \langle & \left[\text{HEAD}\quad number\right]\rangle
\end{array}\right]
\end{array}\right] \\
\text{SEM} & \left[\begin{array}{ll}
\text{INDEX} & i \\
\text{MODE} & ref \\
\text{RESTR} & \left\langle \left[\begin{array}{ll}
\text{RELN} & times \\
\text{RESULT} & k \\
\text{FACTOR1} & l \\
\text{FACTOR2} & m
\end{array}\right], \left[\begin{array}{ll}
\text{RELN} & constant \\
\text{INST} & m \\
\text{VALUE} & 100
\end{array}\right], \left[\begin{array}{ll}
\text{RELN} & plus \\
\text{RESULT} & i \\
\text{TERM1} & j \\
\text{TERM2} & k
\end{array}\right] \right\rangle
\end{array}\right]
\end{array}\right] \right\rangle$$



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# How about this?

$$\left\langle \text{hundred} , \left[ \begin{array}{ll} \text{SYN} & \left[ \begin{array}{ll} \text{HEAD} & number \\ \text{VAL} & \left[ \begin{array}{ll} \text{SPR} & \left\langle \left[ \begin{array}{ll} \text{HEAD} & number \\ \text{INDEX} & l \end{array} \right] \right\rangle \\ \text{COMPS} & \left\langle \left[ \begin{array}{ll} \text{HEAD} & number \\ \text{INDEX} & j \end{array} \right] \right\rangle \end{array} \right] \end{array} \right] \\ \text{SEM} & \left[ \begin{array}{ll} \text{INDEX} & m \\ \text{MODE} & ref \\ \text{RESTR} & \left\langle \left[ \begin{array}{ll} \text{RELN} & times \\ \text{RESULT} & k \\ \text{FACTOR1} & l \\ \text{FACTOR2} & m \end{array} \right], \left[ \begin{array}{ll} \text{RELN} & constant \\ \text{INST} & m \\ \text{VALUE} & 100 \end{array} \right], \left[ \begin{array}{ll} \text{RELN} & plus \\ \text{RESULT} & i \\ \text{TERM1} & j \\ \text{TERM2} & k \end{array} \right] \right\rangle \end{array} \right] \end{array} \right] \right\rangle$$

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# Better version

$$\left\langle \text{hundred}\ , \left[\begin{array}{ll}
\text{SYN} & \left[\begin{array}{ll}
\text{HEAD} & number \\
\text{VAL} & \left[\begin{array}{ll}
\text{SPR} & \left\langle \left[\begin{array}{ll} \text{HEAD} & number \\ \text{INDEX} & l \end{array}\right] \right\rangle \\
\text{COMPS} & \left\langle \left[\begin{array}{ll} \text{HEAD} & number \\ \text{INDEX} & j \end{array}\right] \right\rangle
\end{array}\right]
\end{array}\right] \\
\text{SEM} & \left[\begin{array}{ll}
\text{INDEX} & i \\
\text{MODE} & ref \\
\text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & times \\ \text{RESULT} & k \\ \text{FACTOR1} & l \\ \text{FACTOR2} & m \end{array}\right], \left[\begin{array}{ll} \text{RELN} & constant \\ \text{INST} & m \\ \text{VALUE} & 100 \end{array}\right], \left[\begin{array}{ll} \text{RELN} & plus \\ \text{RESULT} & i \\ \text{TERM1} & j \\ \text{TERM2} & k \end{array}\right] \right\rangle
\end{array}\right]
\end{array}\right] \right\rangle$$

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# SPR value on AP/PP?

- Kim grew fond of baseball.
- Kim and Sandy ate lunch in the park.
- Kim and Sandy are in the park.



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# Type hierarchy analogies

- How is this formalism like OOP?
- How is it different?
- How is the type hierarchy like an ontology?
- How is it different?
- How is this formalism like the MP's formalism?
- How is it different?



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