Breaking it down

[Meaning], [Representation] and [Parsing]
1. What we mean, 2. How to represent (something), 3. How to parse (something)

or

[Meaning Representation] and [Parsing]
1. How to represent what we mean, 2. How to parse (something)

or

[Meaning [Representation and Parsing]]
1. How to represent what we mean, 2. How to parse what we mean

or

[Meaning Representation] and [Parsing *(to Meaning Representation)*]
1. How to represent what we mean, 2. How to parse (1)

Breaking it down

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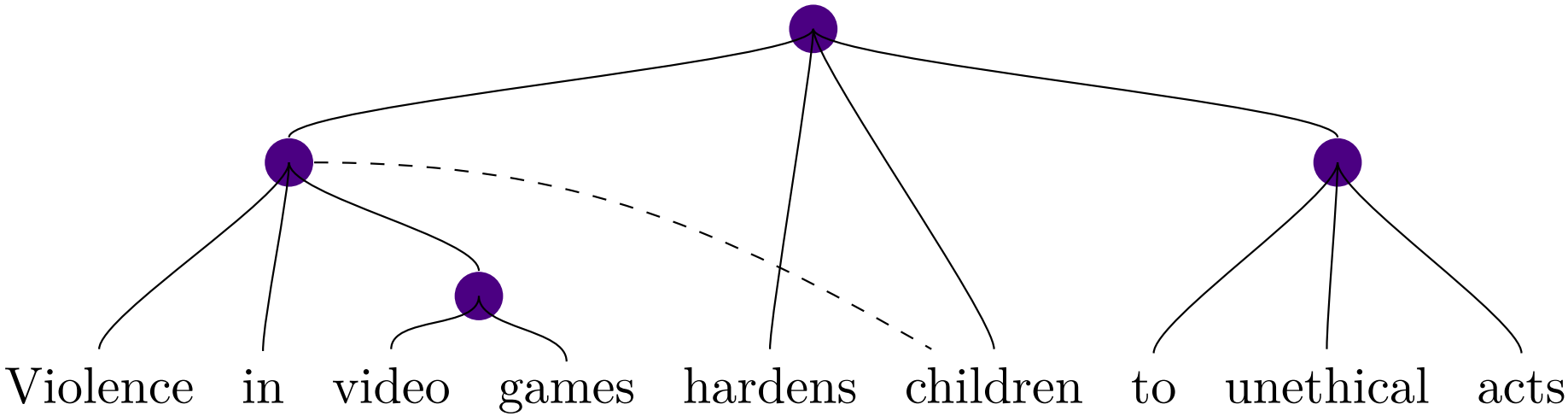
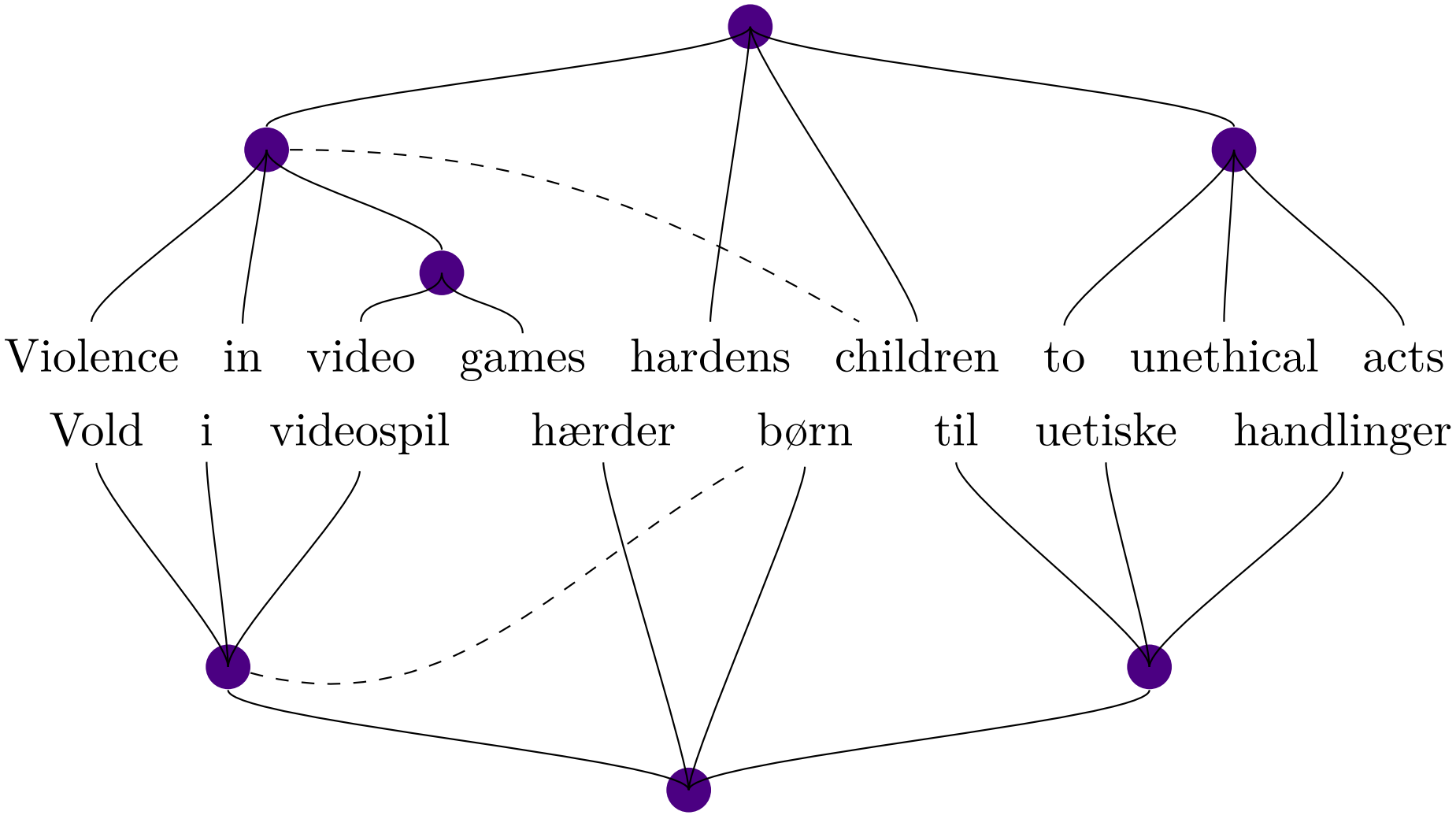
[Meaning Representation] and [Parsing *(to Meaning Representation)*]
1. How to represent what we mean, 2. How to parse (1)

Graphs

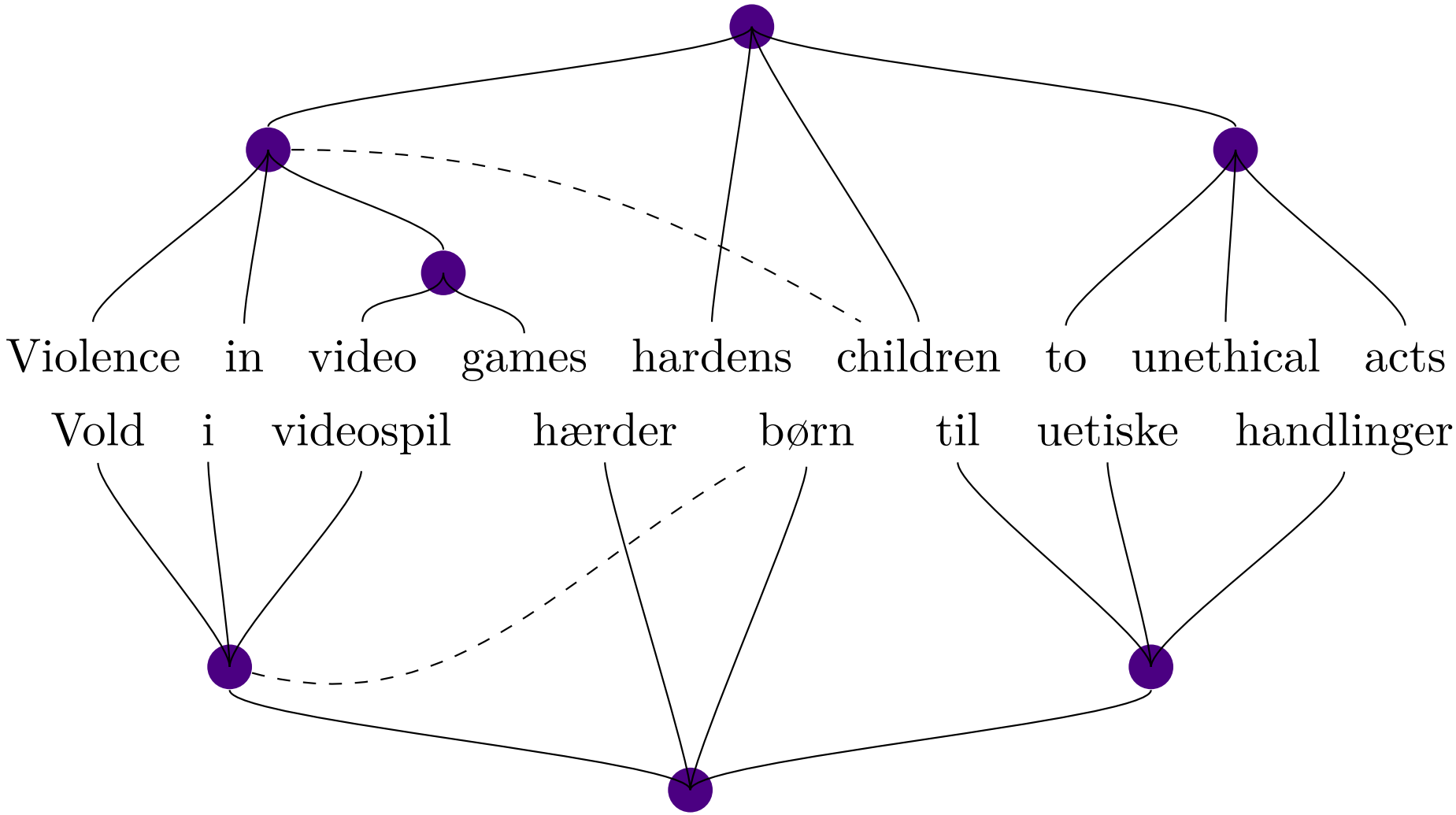

Violence
in
video
games
hardens
children
to
unethical
acts

Graphs

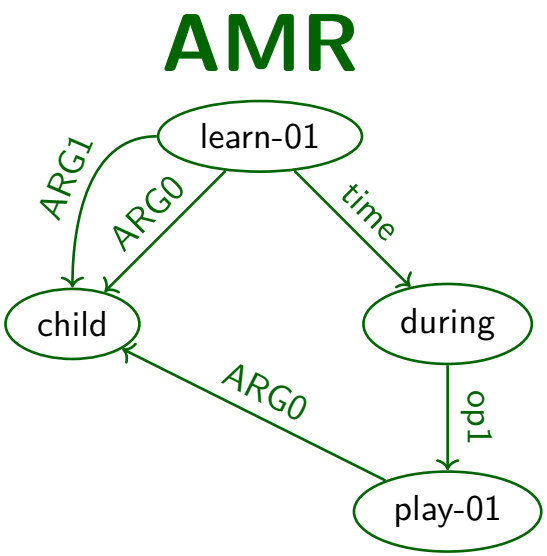

Violence in video games hardens children to unethical acts
Vold i videospil hærder børn til uetiske handlinger

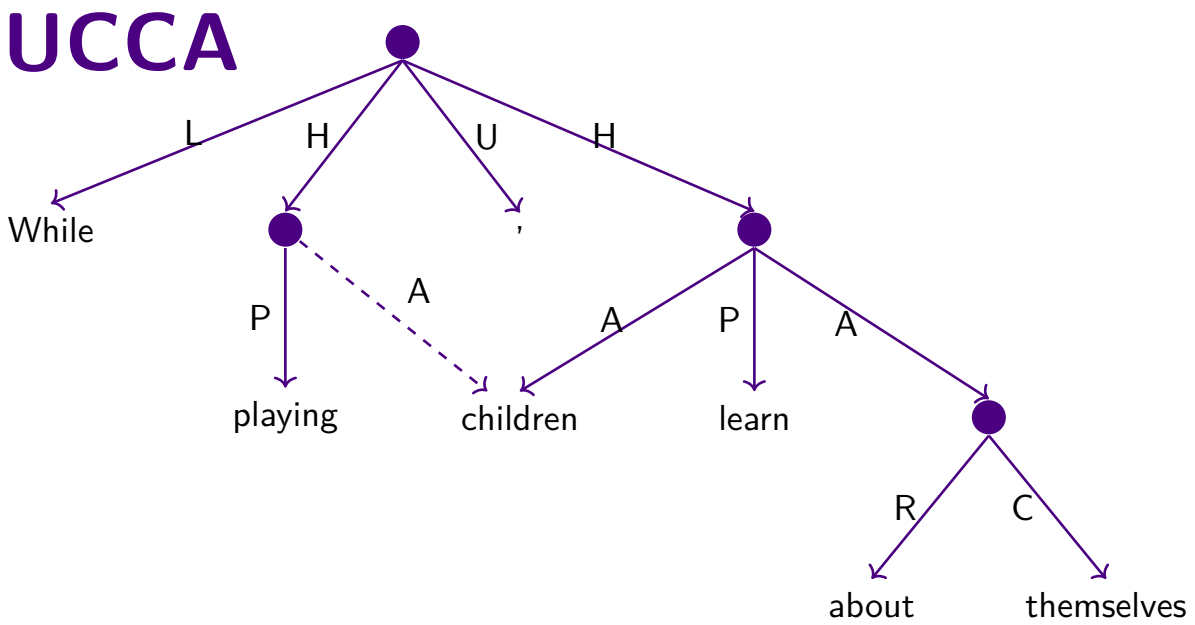
Graphs

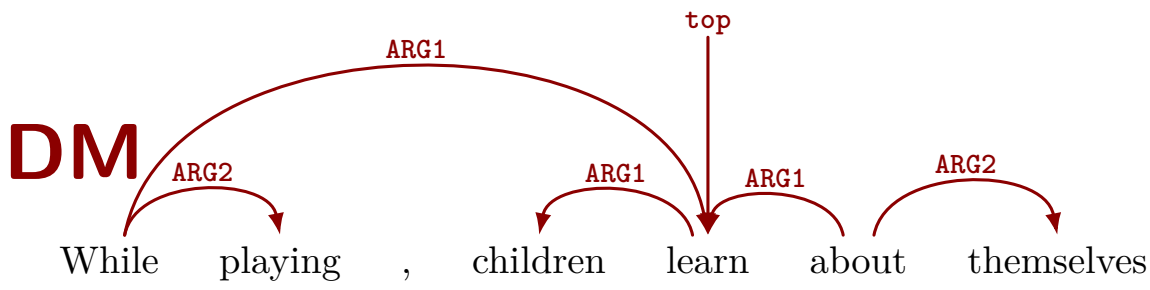
Universal Conceptual Cognitive Annotation (UCCA):



Meaning representation frameworks







Parsing

A Transition-Based Directed Acyclic Graph Parser for UCCA (2017)
`http://bit.ly/tupademo`

Parsing

A Transition-Based Directed Acyclic Graph Parser for UCCA (2017)

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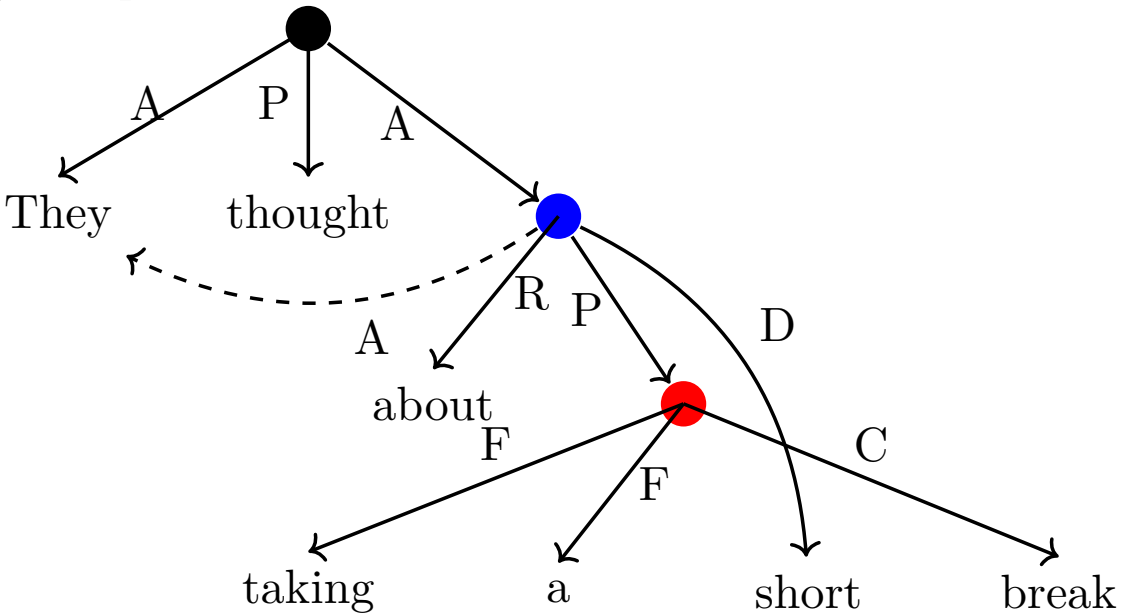

Shift, Right-Edge$_A$, Shift, Swap, Right-Edge$_P$, Reduce, Shift, Shift, Node$_R$, Reduce, Left-Remote$_A$, Shift, Shift, Node$_C$, Reduce, Shift, Right-Edge$_P$, Shift, Right-Edge$_F$, Reduce, Shift, Swap, Right-Edge$_D$, Reduce, Swap, Right-Edge$_A$, Reduce, Reduce, Shift, Reduce, Shift, Right-Edge$_C$, Finish

TUPA: Transition-based UCCA Parser

Parses text $w_1 \ldots w_n$ to graph G incrementally by applying transitions to the parser state, consisting of: stack, buffer and constructed graph.

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Initial state:

TUPA: Transition-based UCCA Parser

Parses text $w_1 \ldots w_n$ to graph G incrementally by applying transitions to the parser state, consisting of: stack, buffer and constructed graph.

Initial state:

Transitions:

{SHIFT, REDUCE, NODE$_X$, LEFT-EDGE$_X$, RIGHT-EDGE$_X$,
LEFT-REMOTE$_X$, RIGHT-REMOTE$_X$, SWAP, FINISH}

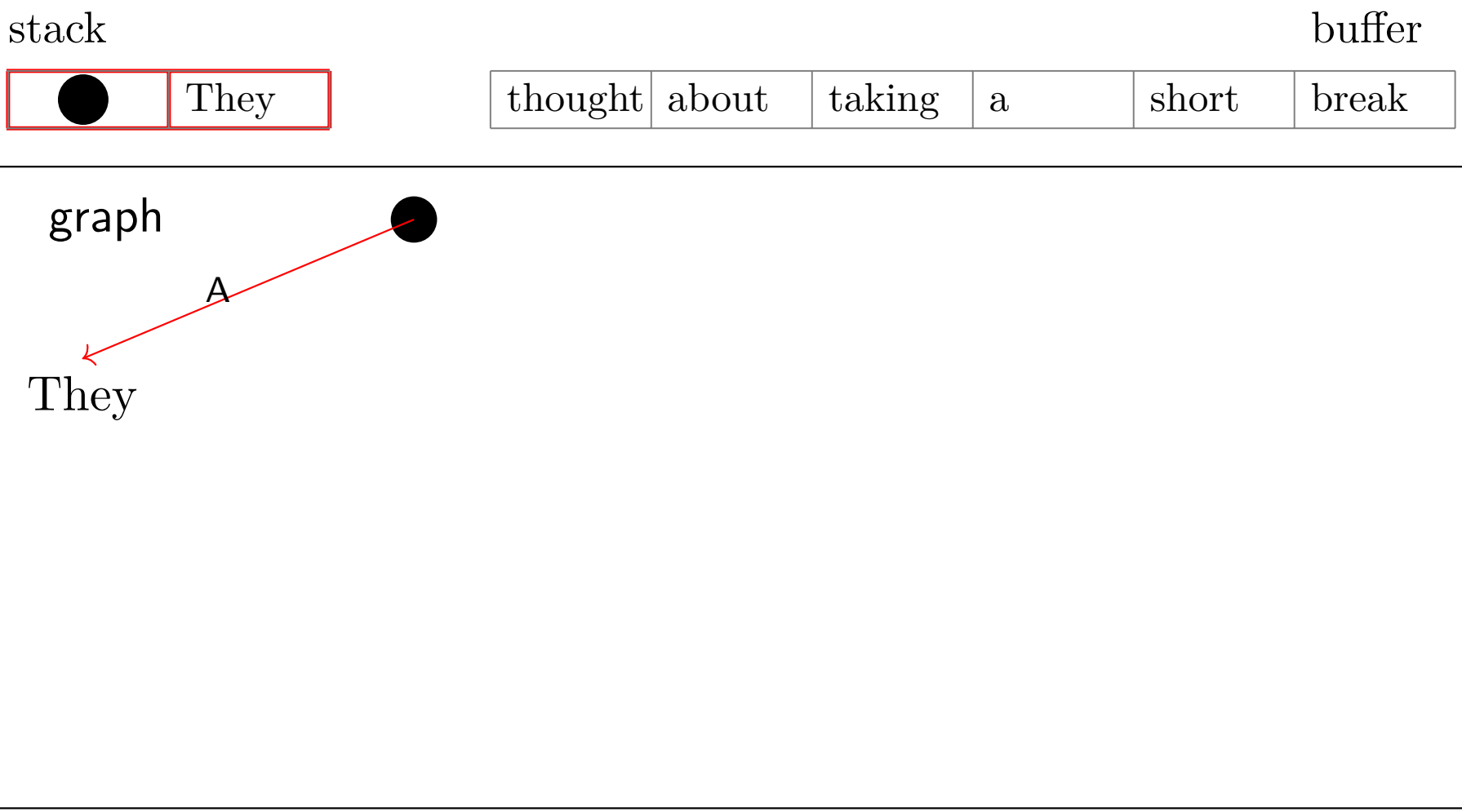
Example: TUPA Transition Sequence

$\Rightarrow$ SHIFT

graph

Example: TUPA Transition Sequence

$\Rightarrow$ RIGHT-EDGE$_A$



Example: TUPA Transition Sequence

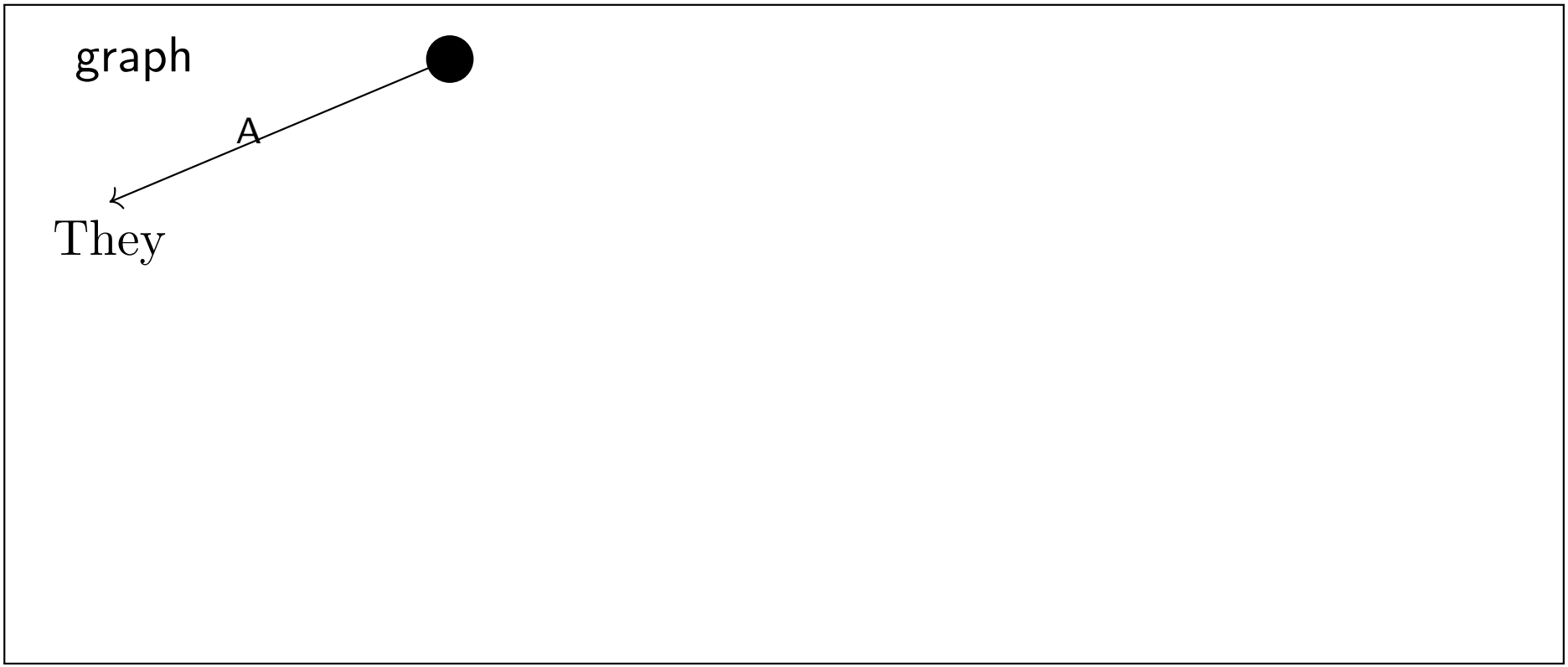
$\Rightarrow$ SHIFT

stack

●	They	thought

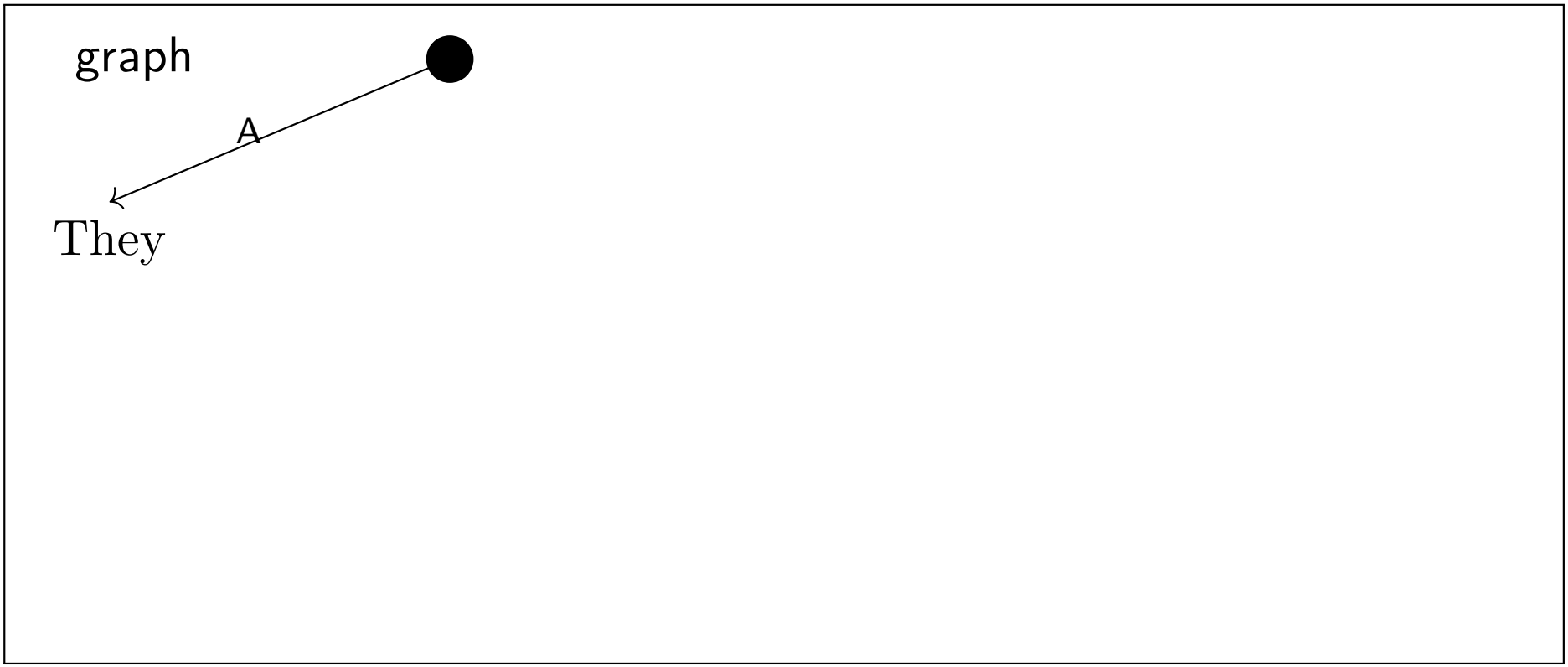
buffer

about	taking	a	short	break



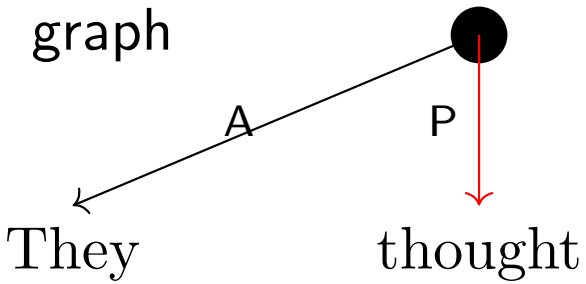
Example: TUPA Transition Sequence

$\Rightarrow$ SWAP



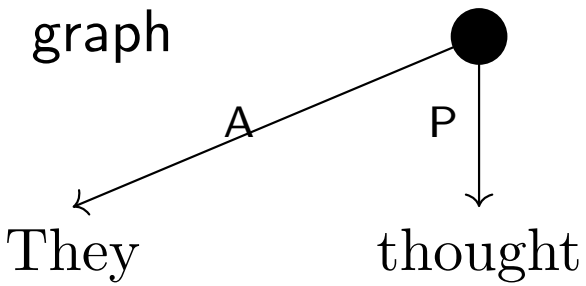
Example: TUPA Transition Sequence

$\Rightarrow$ RIGHT-EDGE$_P$



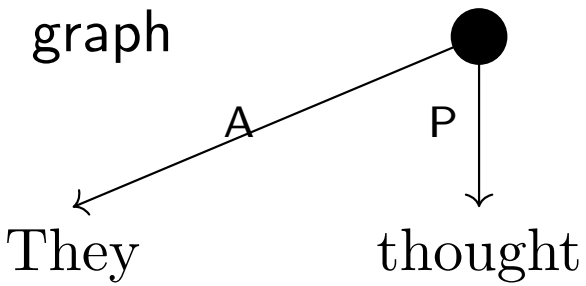
Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE



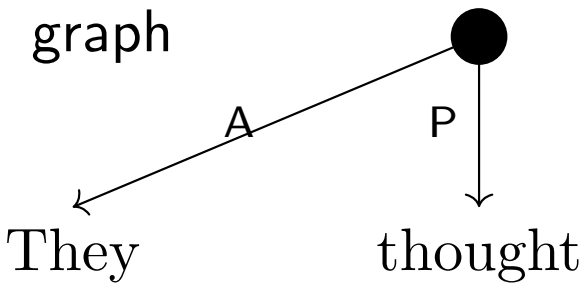
Example: TUPA Transition Sequence

$\Rightarrow$ SHIFT



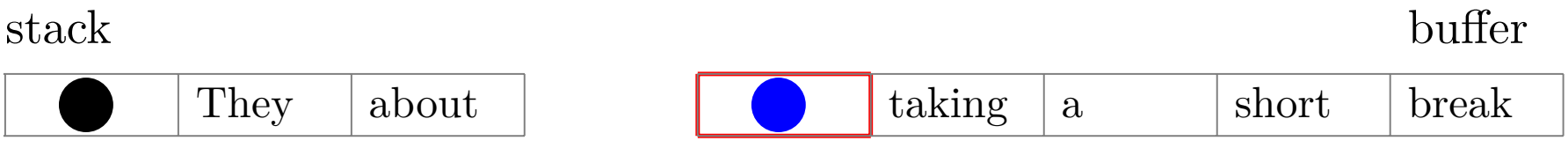
Example: TUPA Transition Sequence

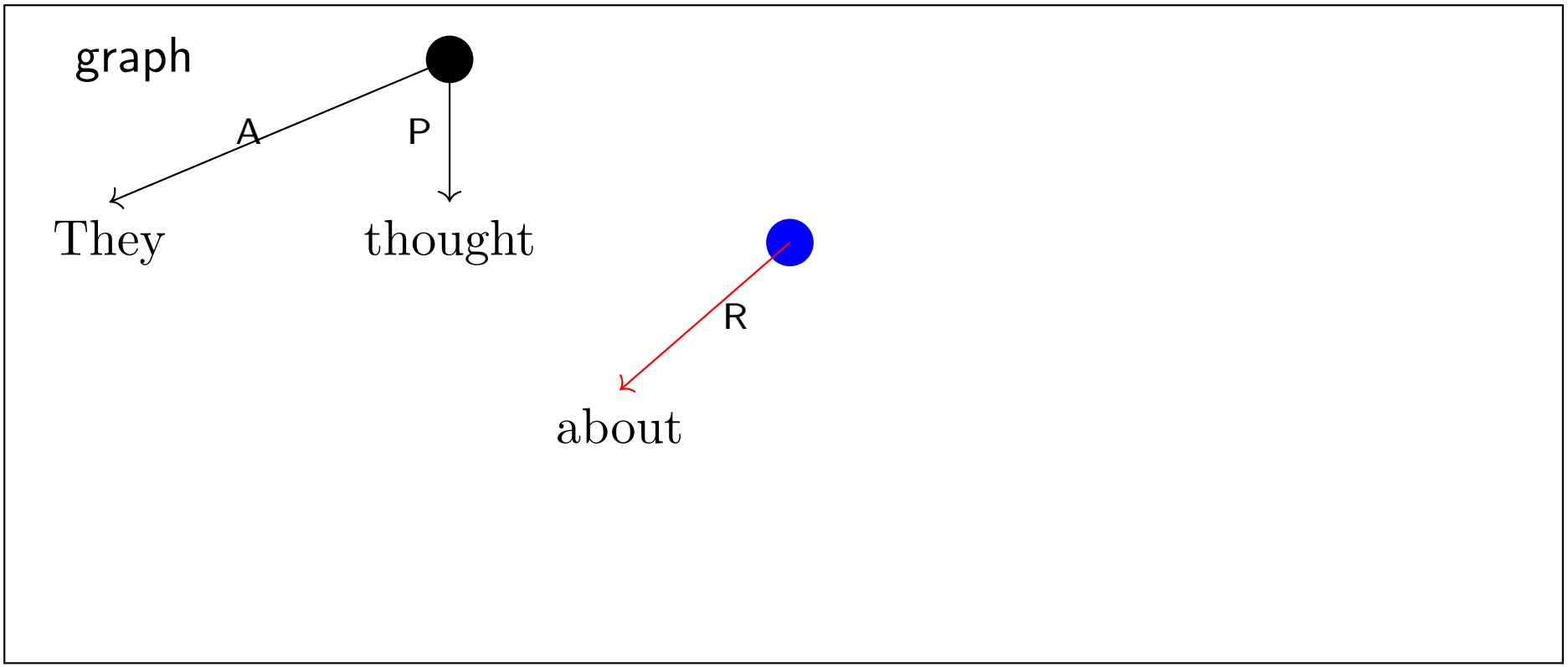
$\Rightarrow$ SHIFT



Example: TUPA Transition Sequence

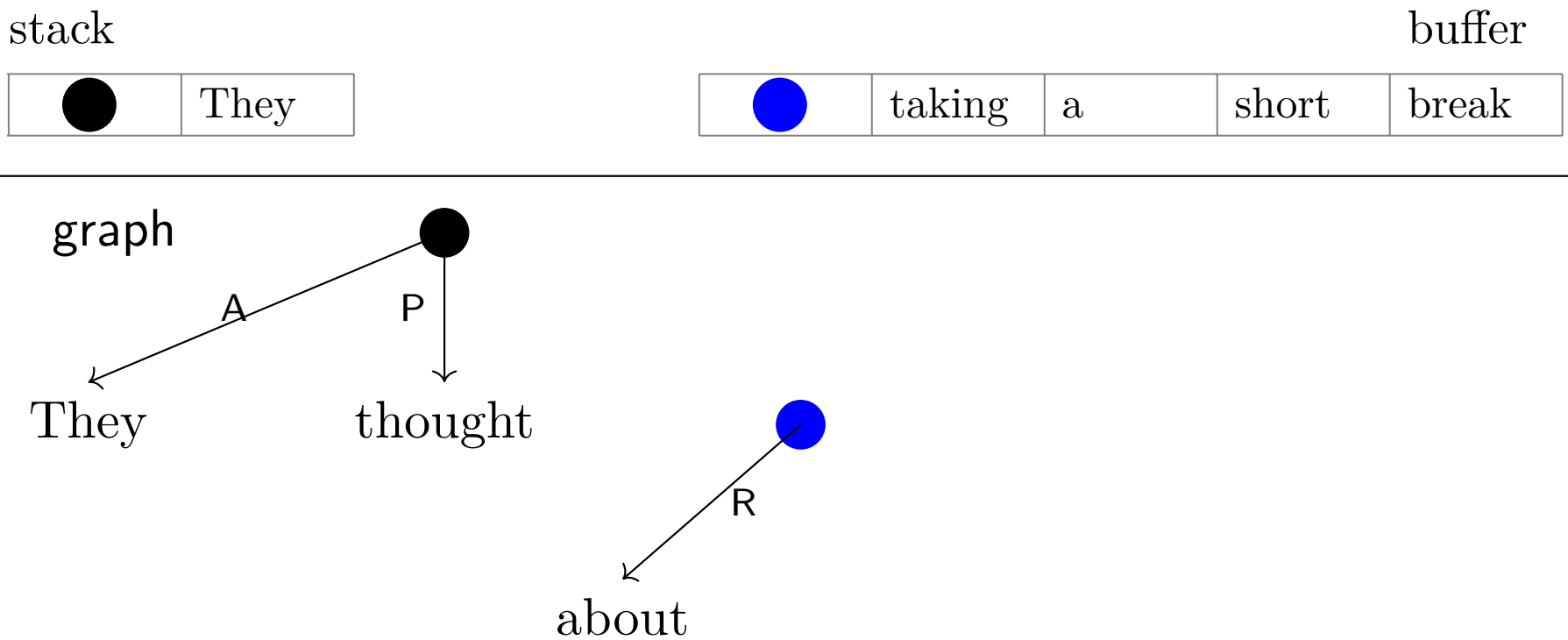
$\Rightarrow$ $\textsc{Node}_R$





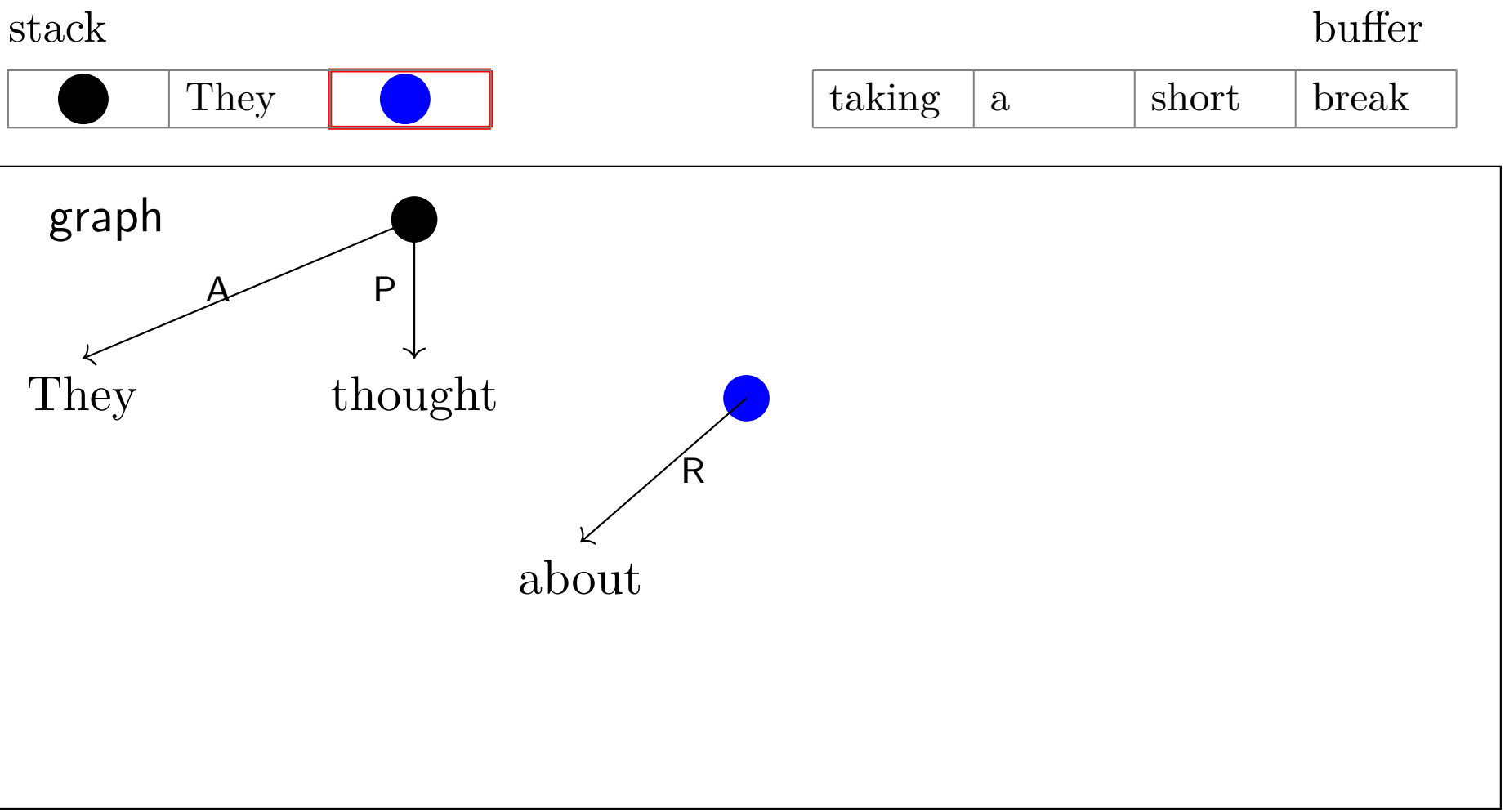
Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE



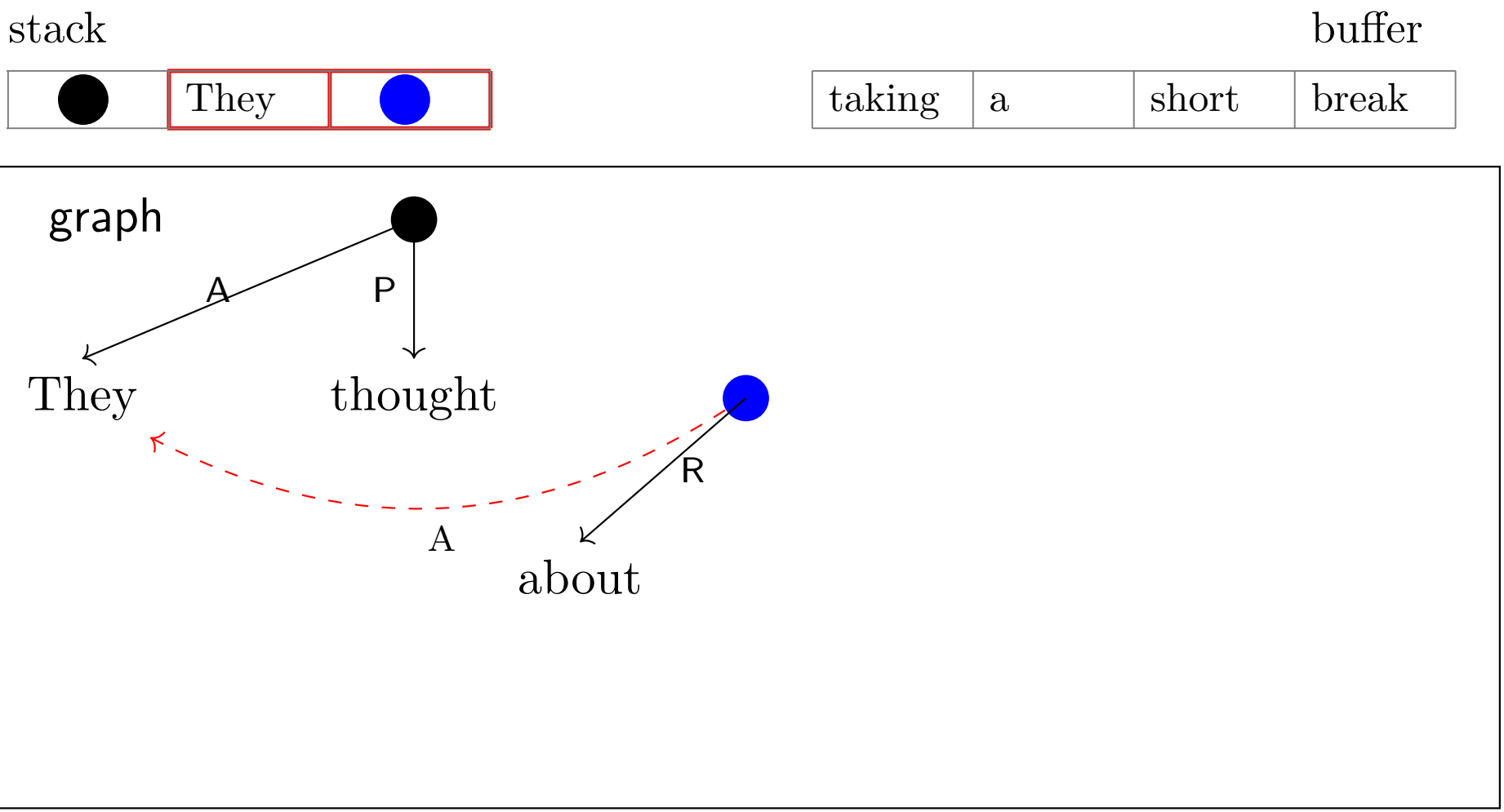
Example: TUPA Transition Sequence

$\Rightarrow$ SHIFT



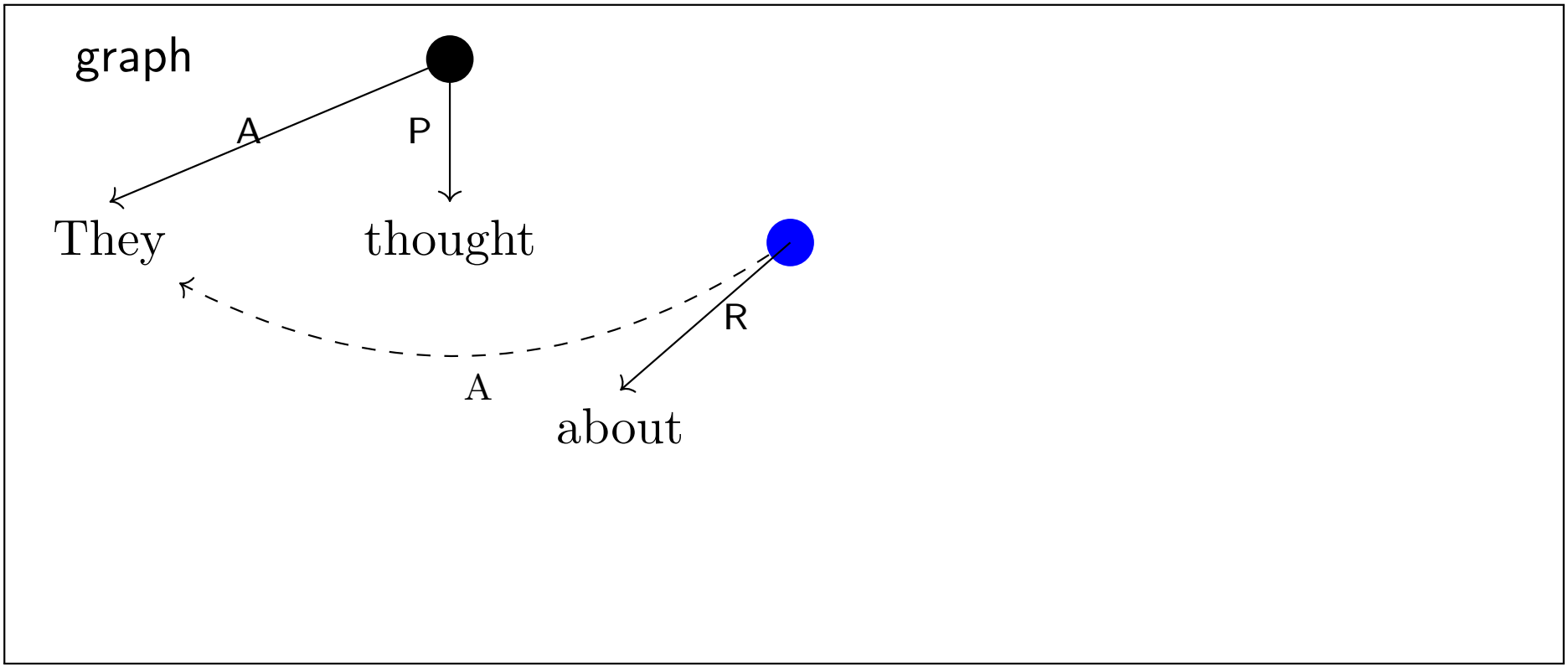
Example: TUPA Transition Sequence

$\Rightarrow$ LEFT-REMOTE$_A$



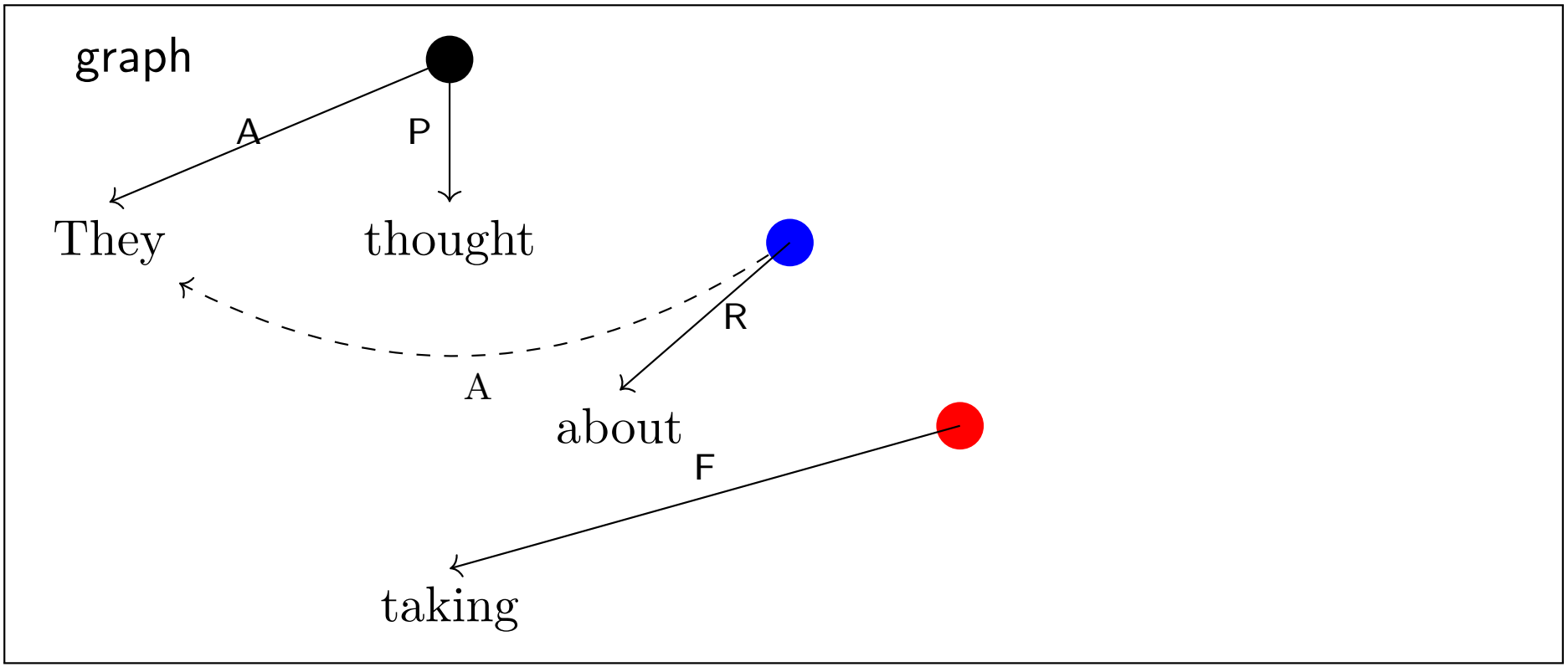
Example: TUPA Transition Sequence

$\Rightarrow$ SHIFT



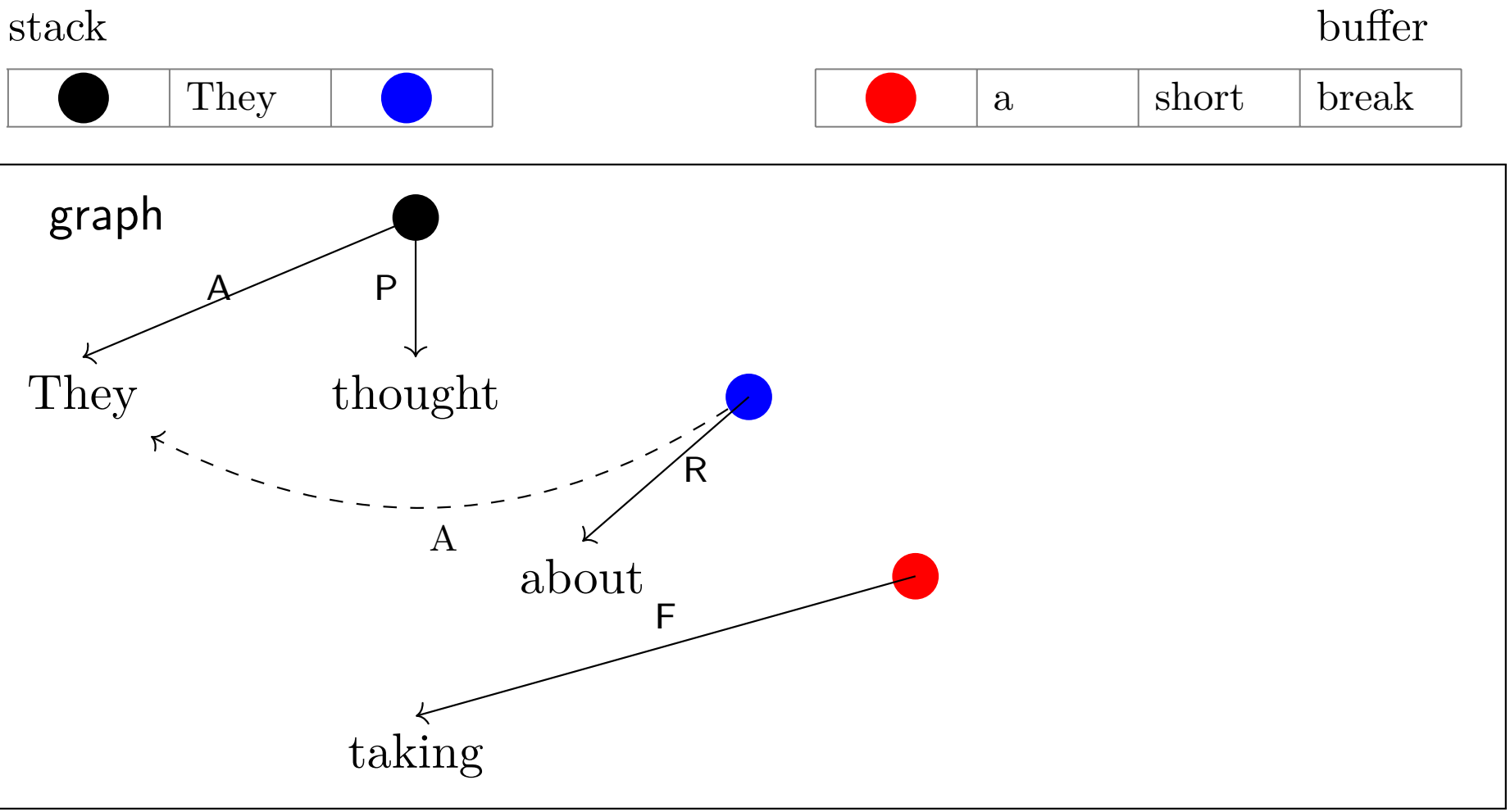
Example: TUPA Transition Sequence

$\Rightarrow$ $\textsc{Node}_C$



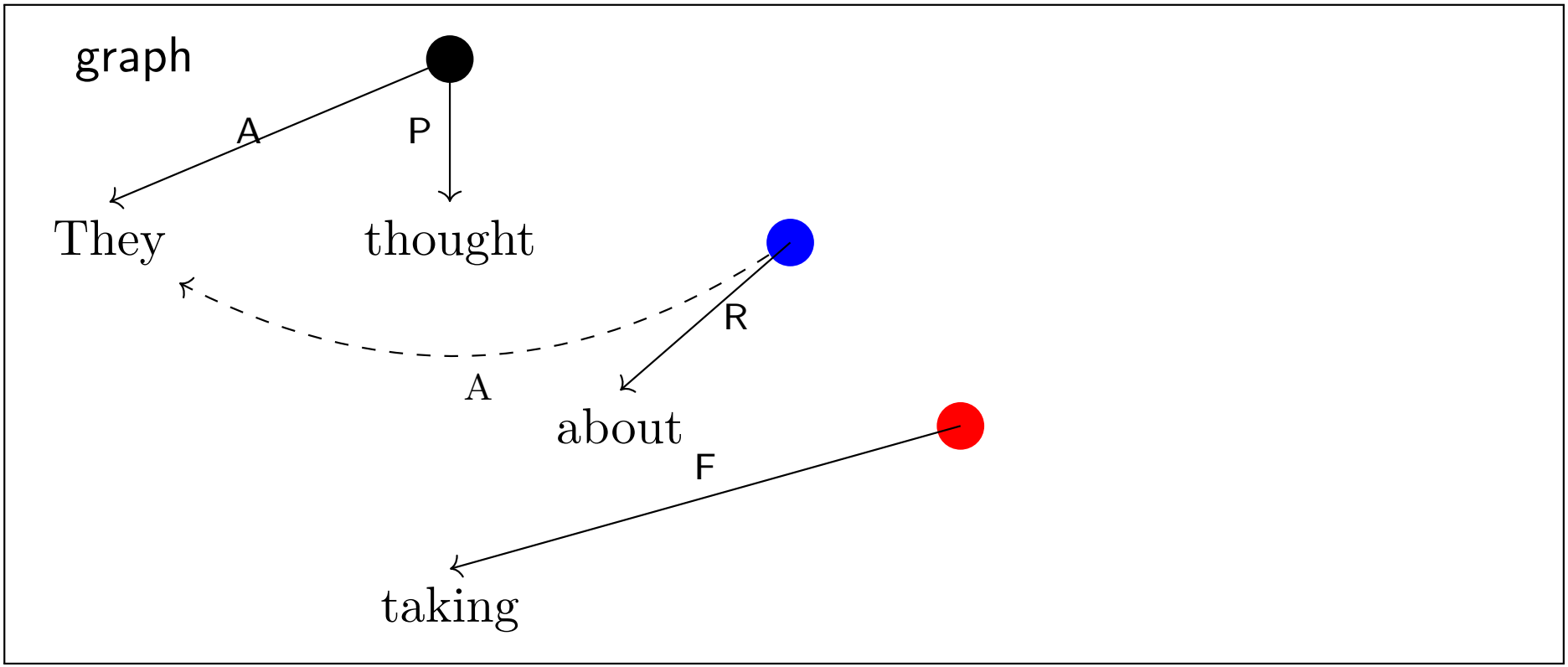
Example: TUPA Transition Sequence

⇒ REDUCE



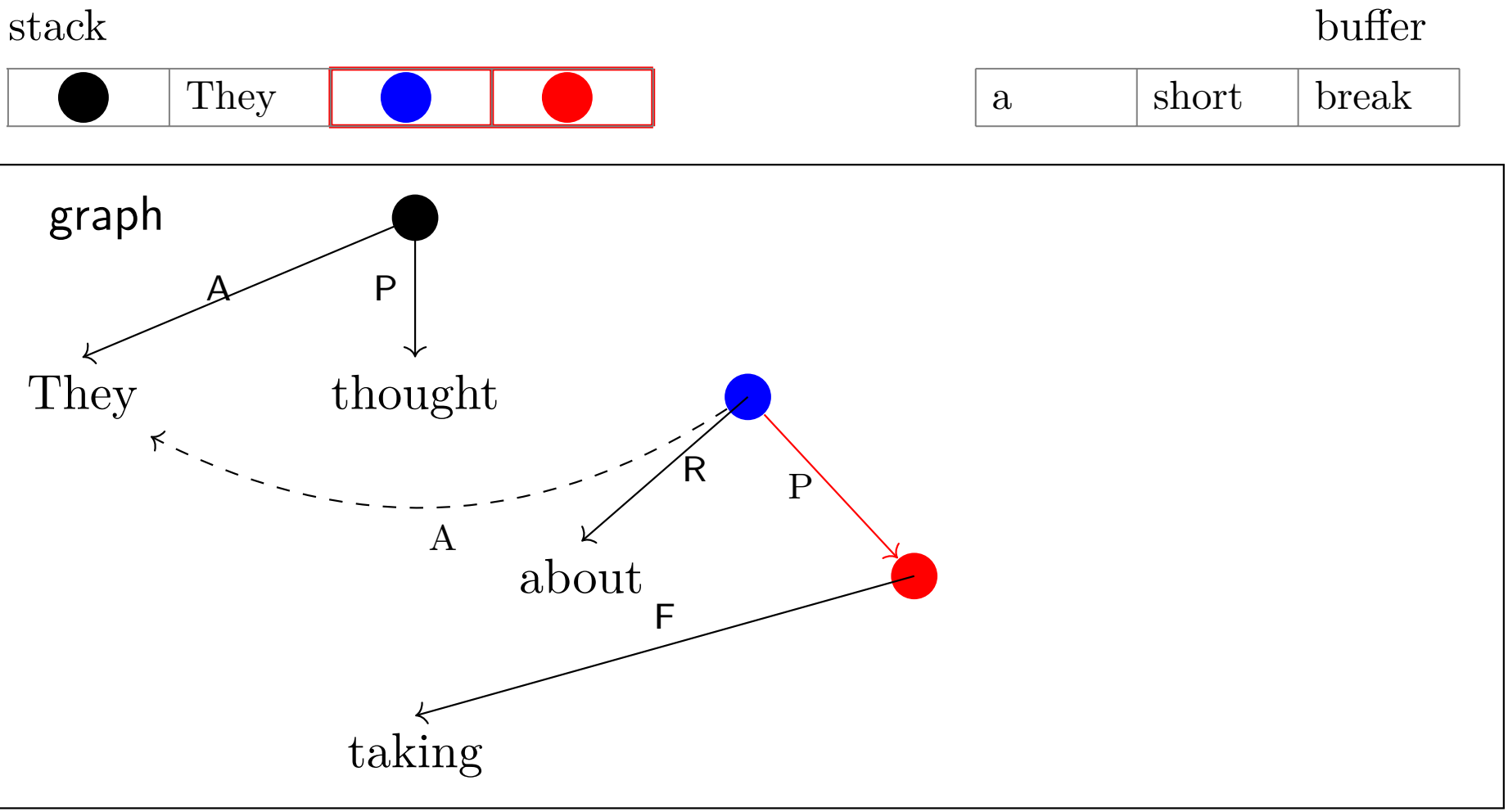
Example: TUPA Transition Sequence

$\Rightarrow$ SHIFT



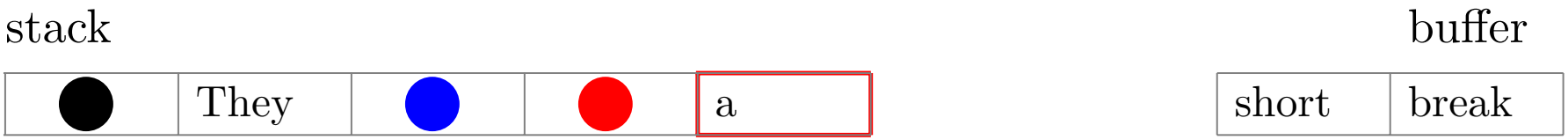
Example: TUPA Transition Sequence

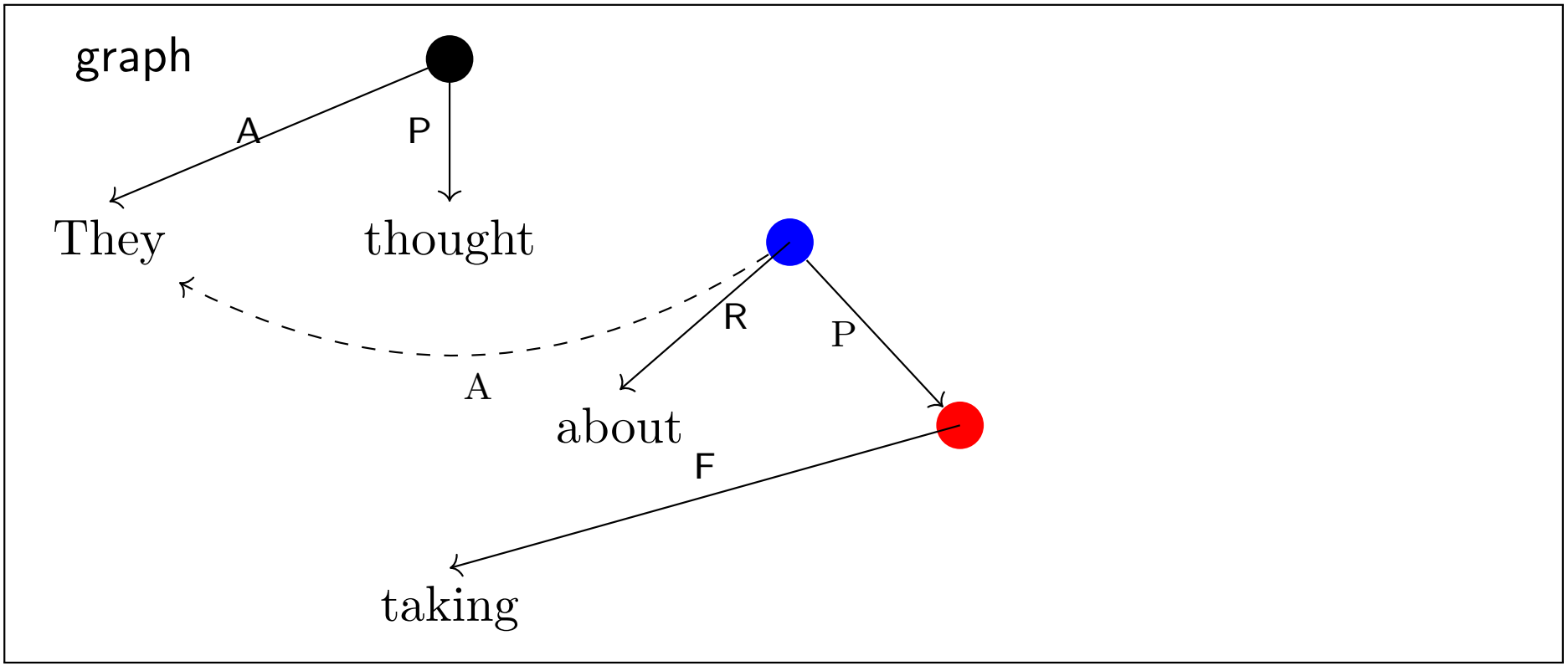
$\Rightarrow$ RIGHT-EDGE$_P$



Example: TUPA Transition Sequence

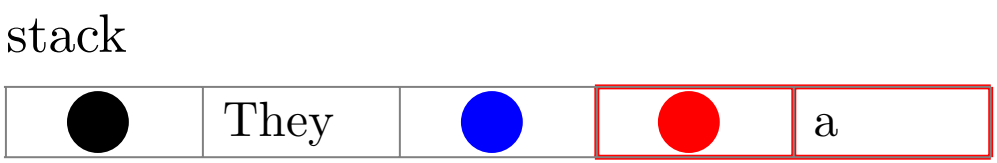
$\Rightarrow$ SHIFT

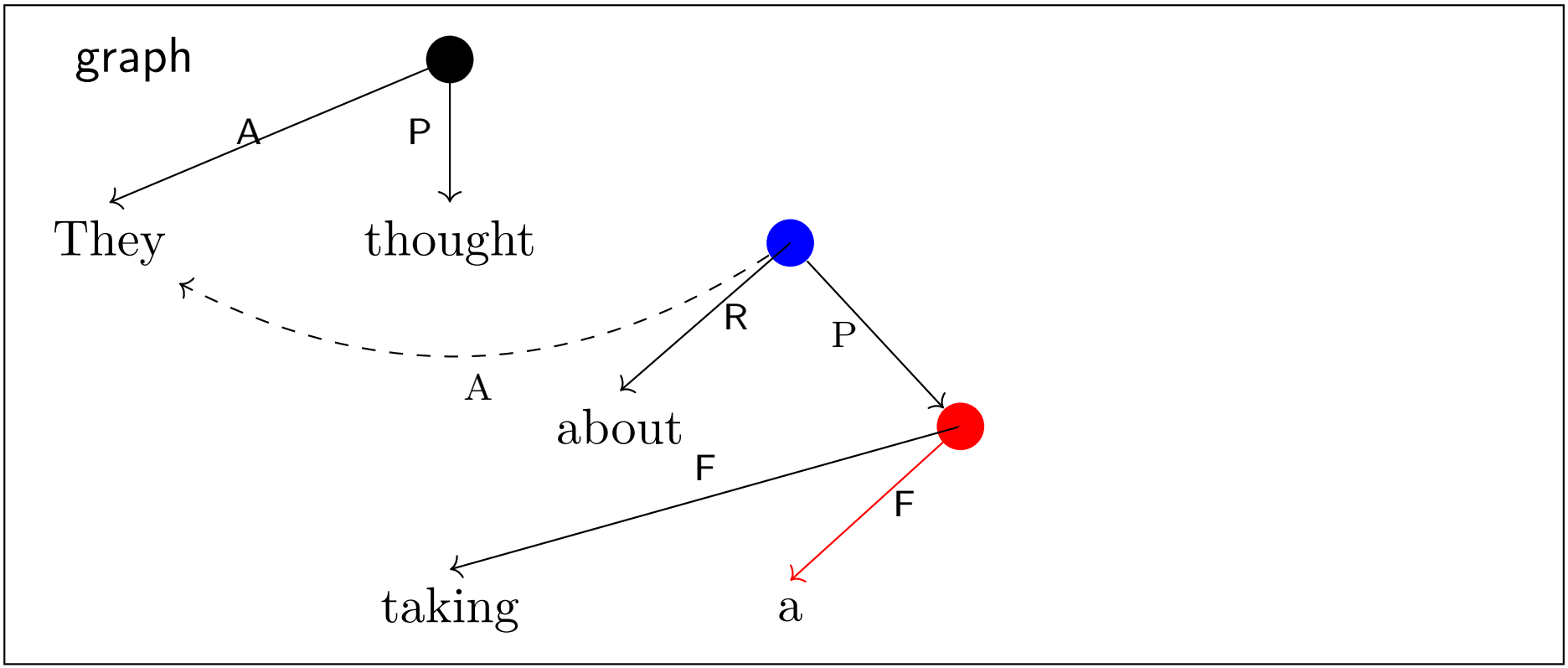




Example: TUPA Transition Sequence

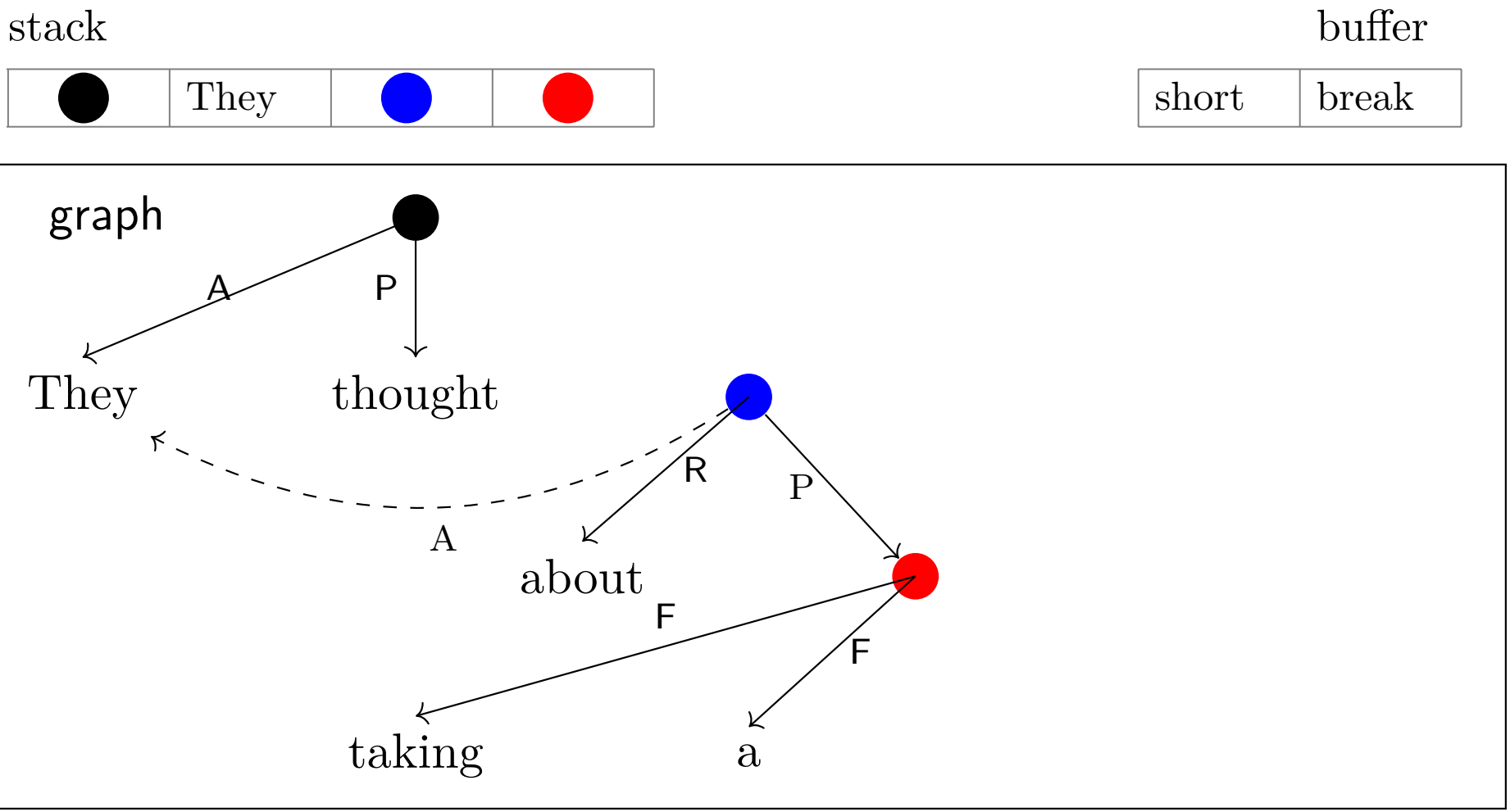
$\Rightarrow$ RIGHT-EDGE$_F$





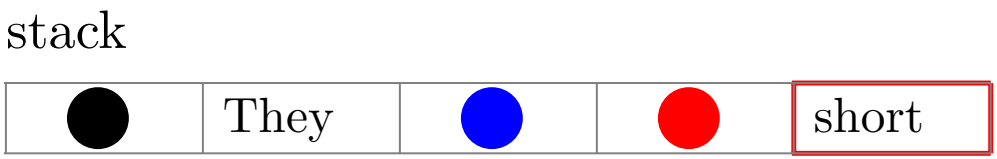
Example: TUPA Transition Sequence

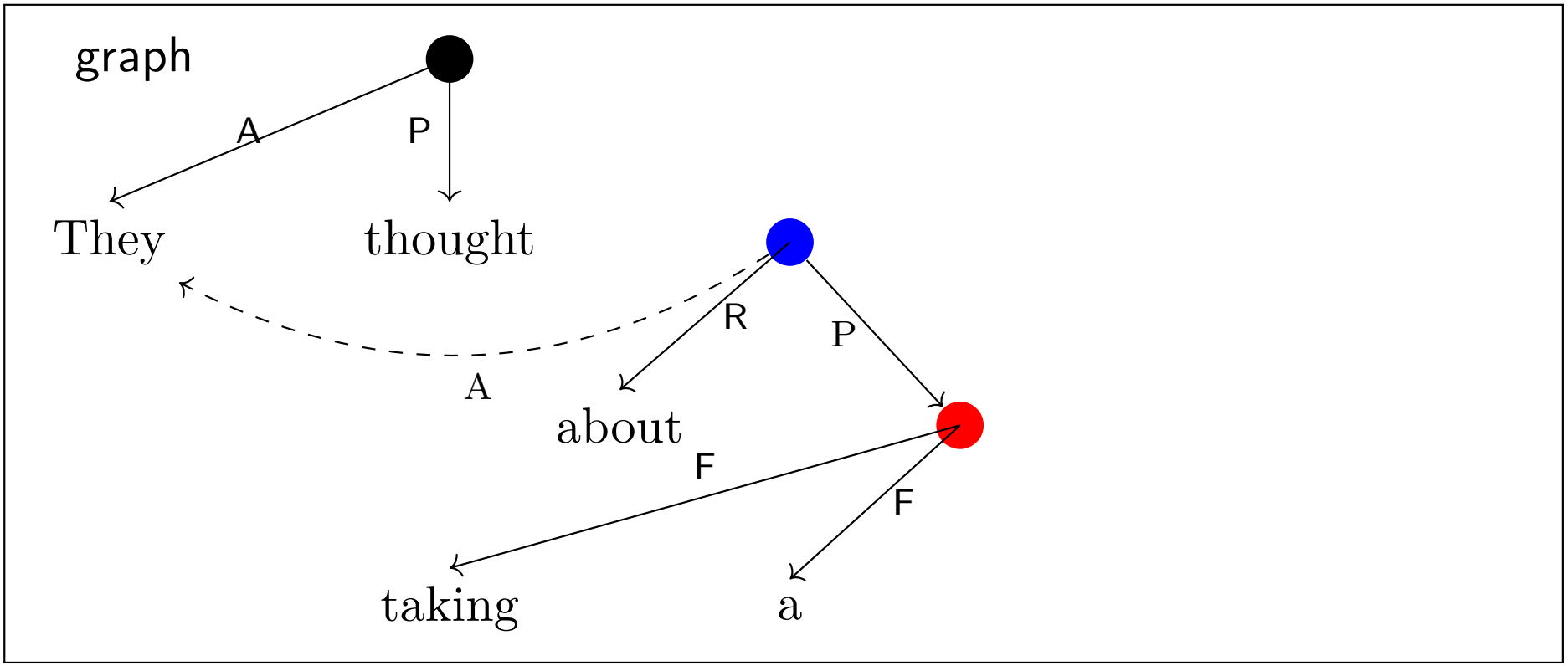
$\Rightarrow$ REDUCE



Example: TUPA Transition Sequence

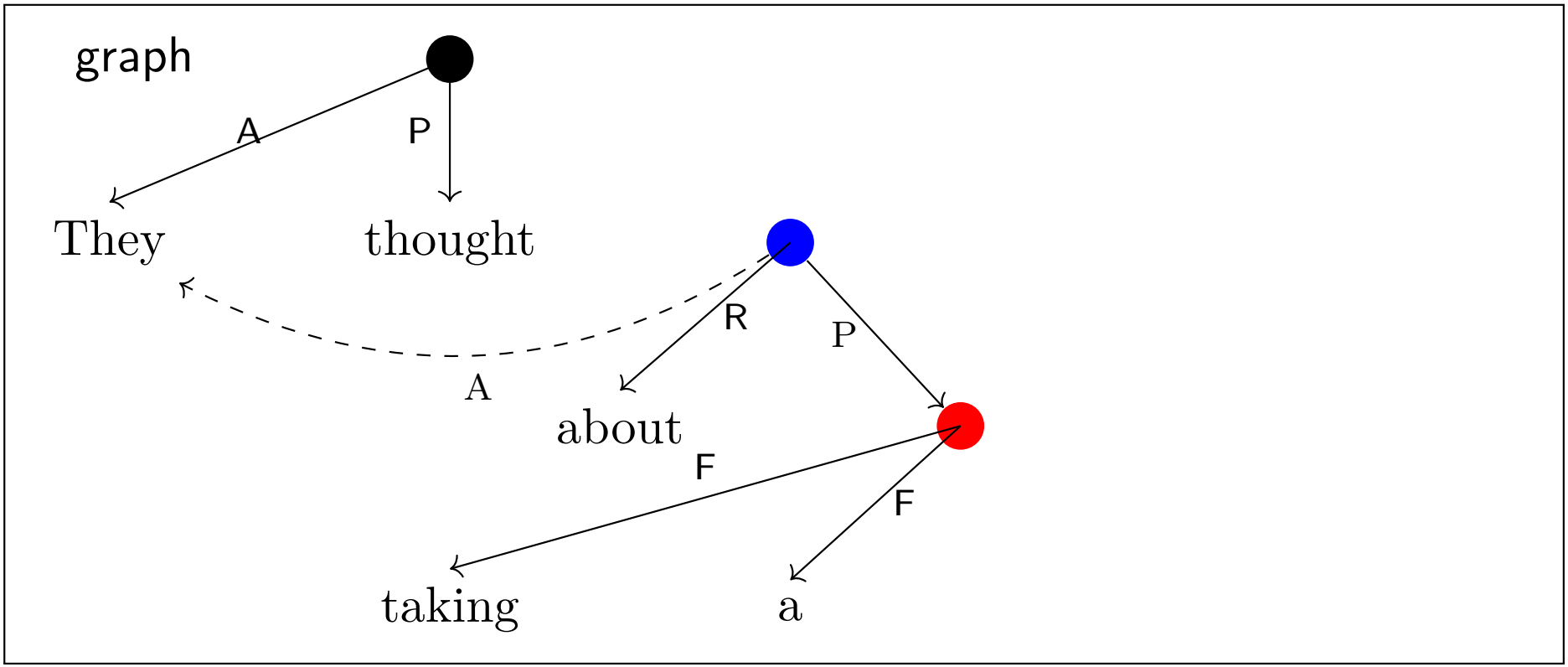
$\Rightarrow$ SHIFT





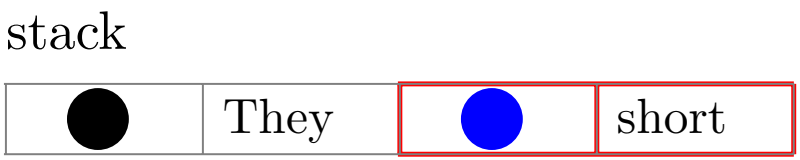
Example: TUPA Transition Sequence

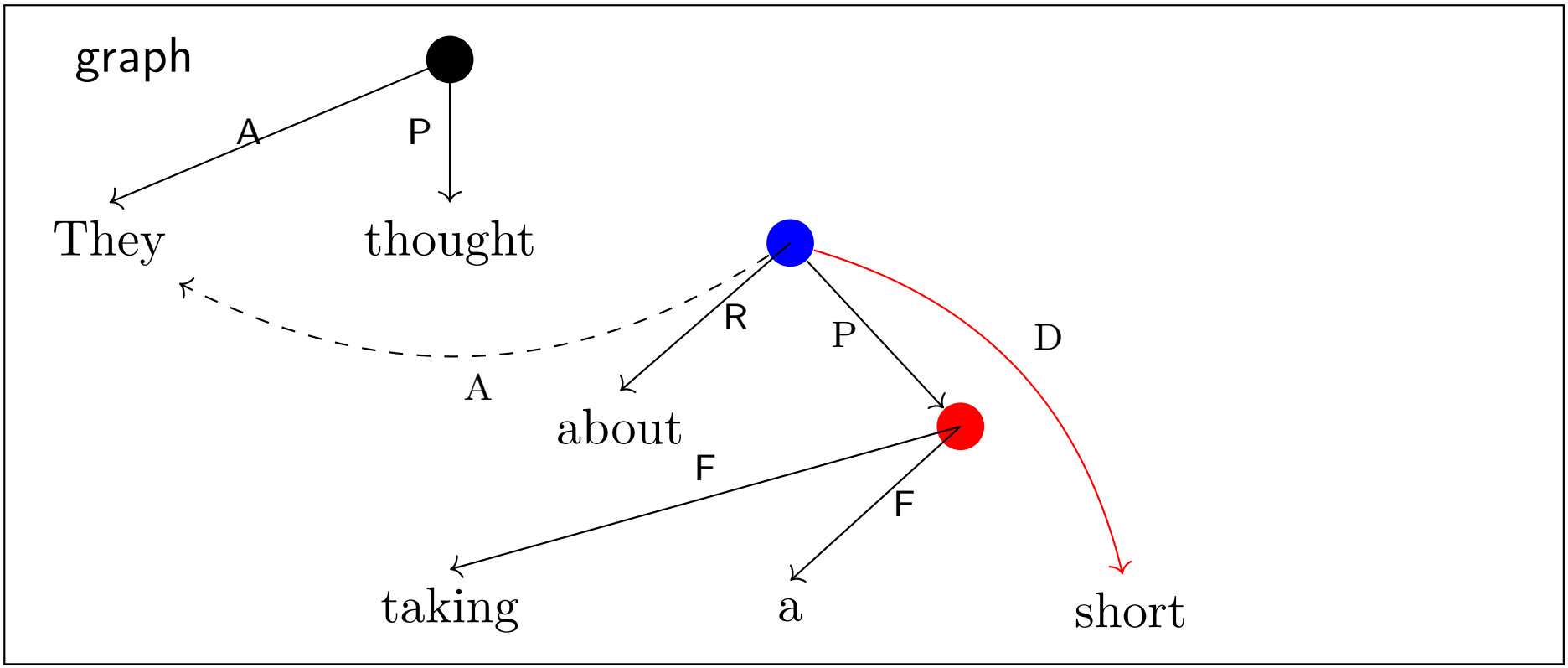
$\Rightarrow$ SWAP



Example: TUPA Transition Sequence

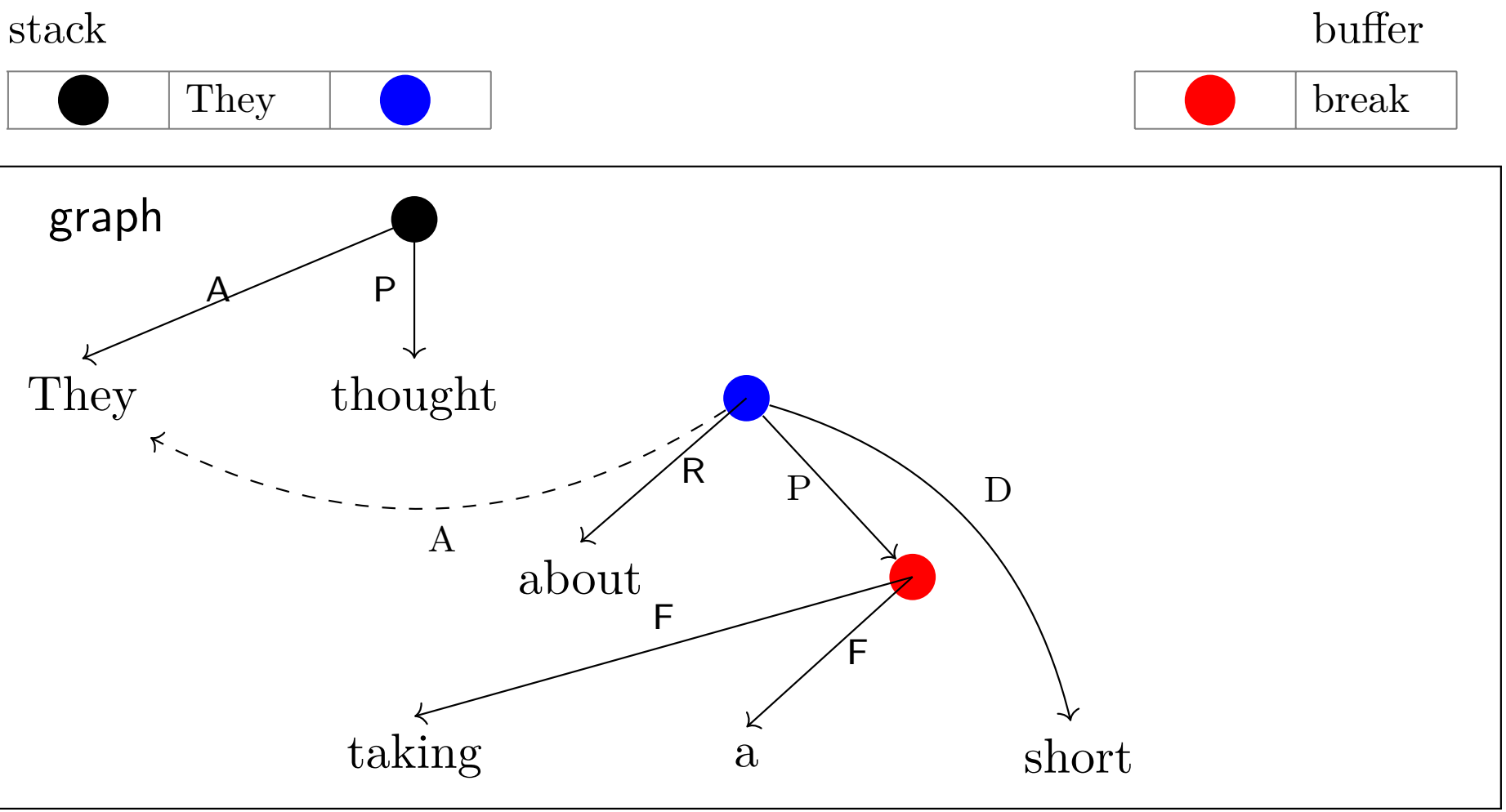
$\Rightarrow$ RIGHT-EDGE$_D$





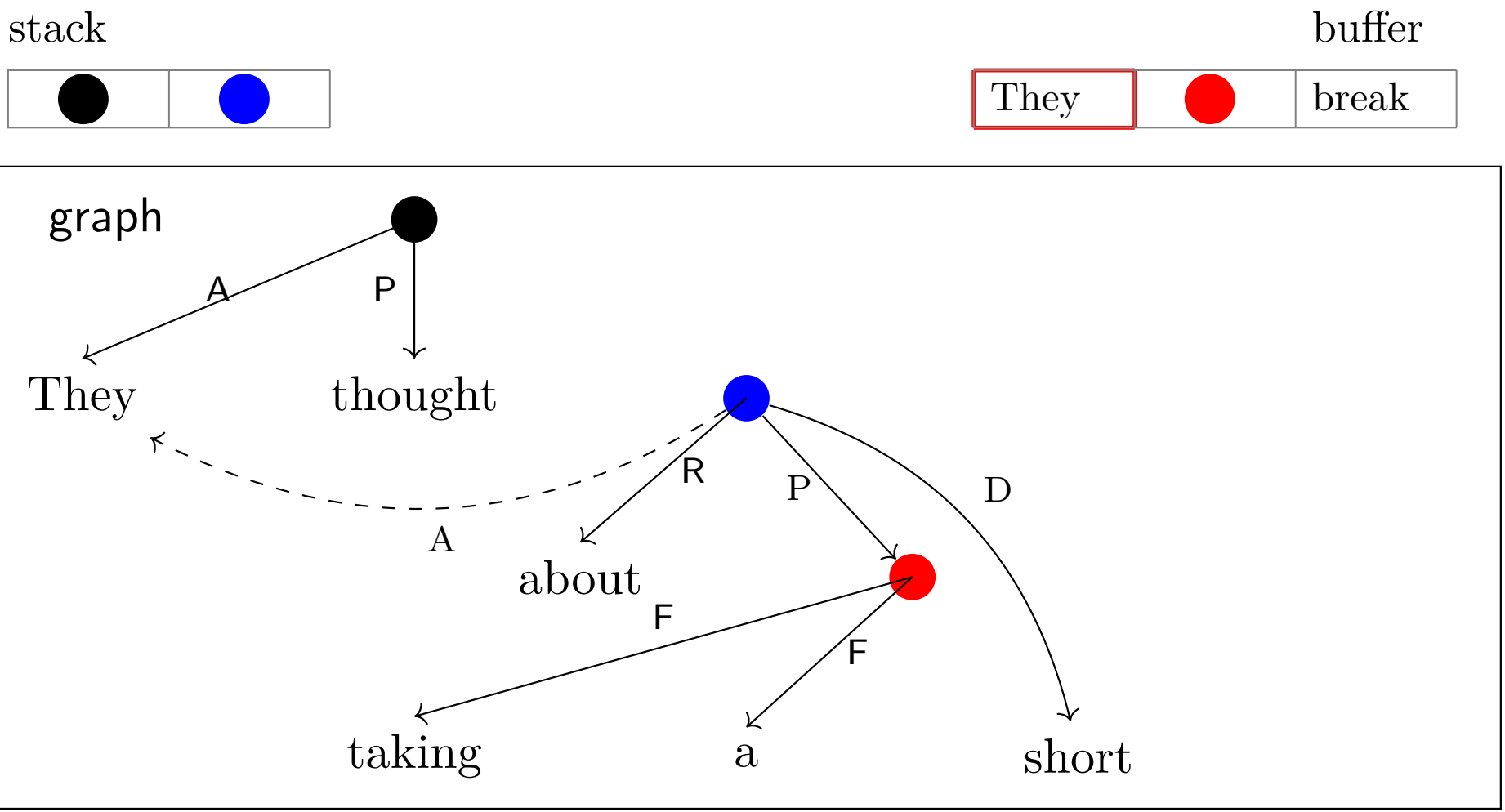
Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE



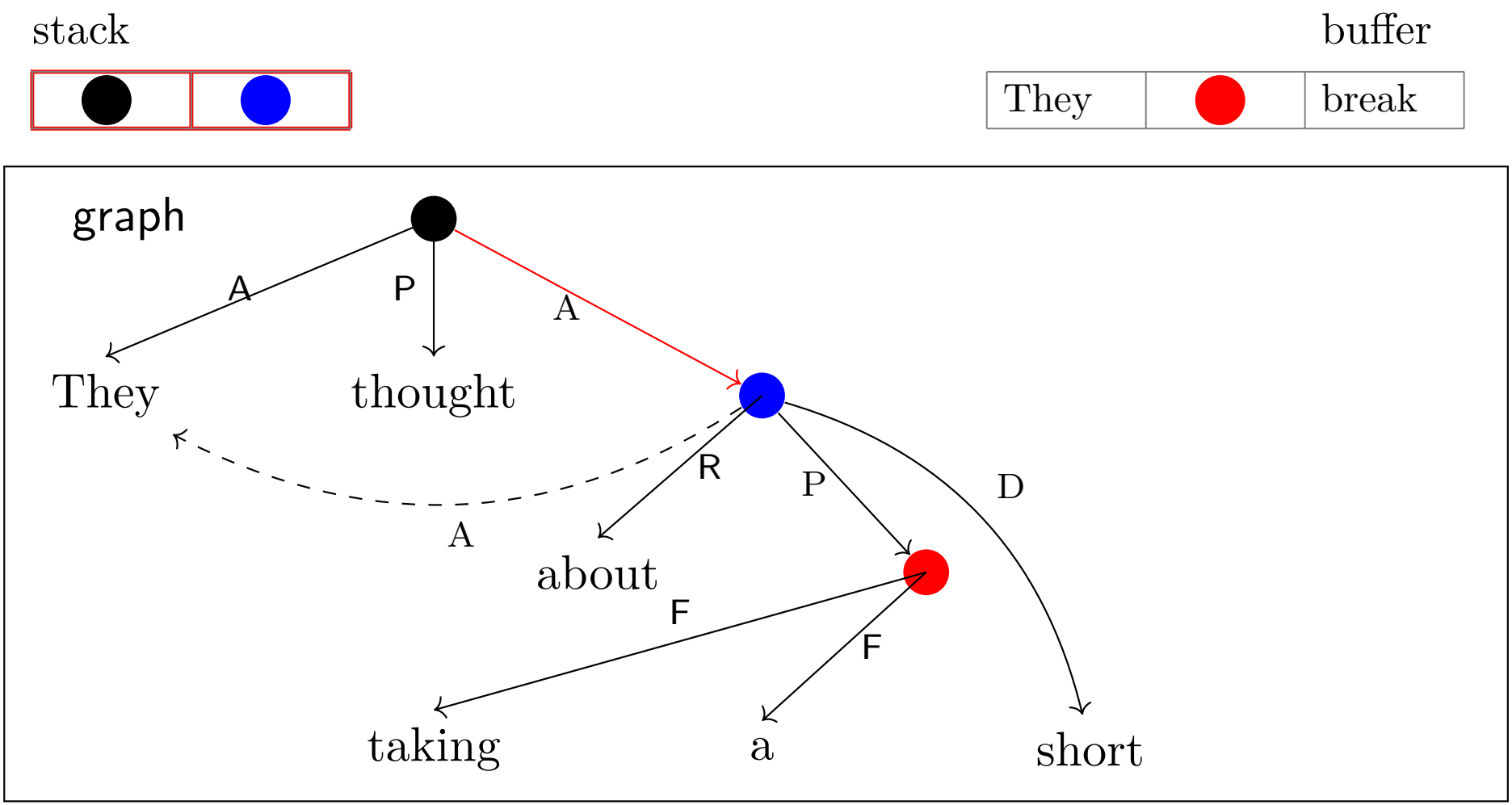
Example: TUPA Transition Sequence

$\Rightarrow$ SWAP



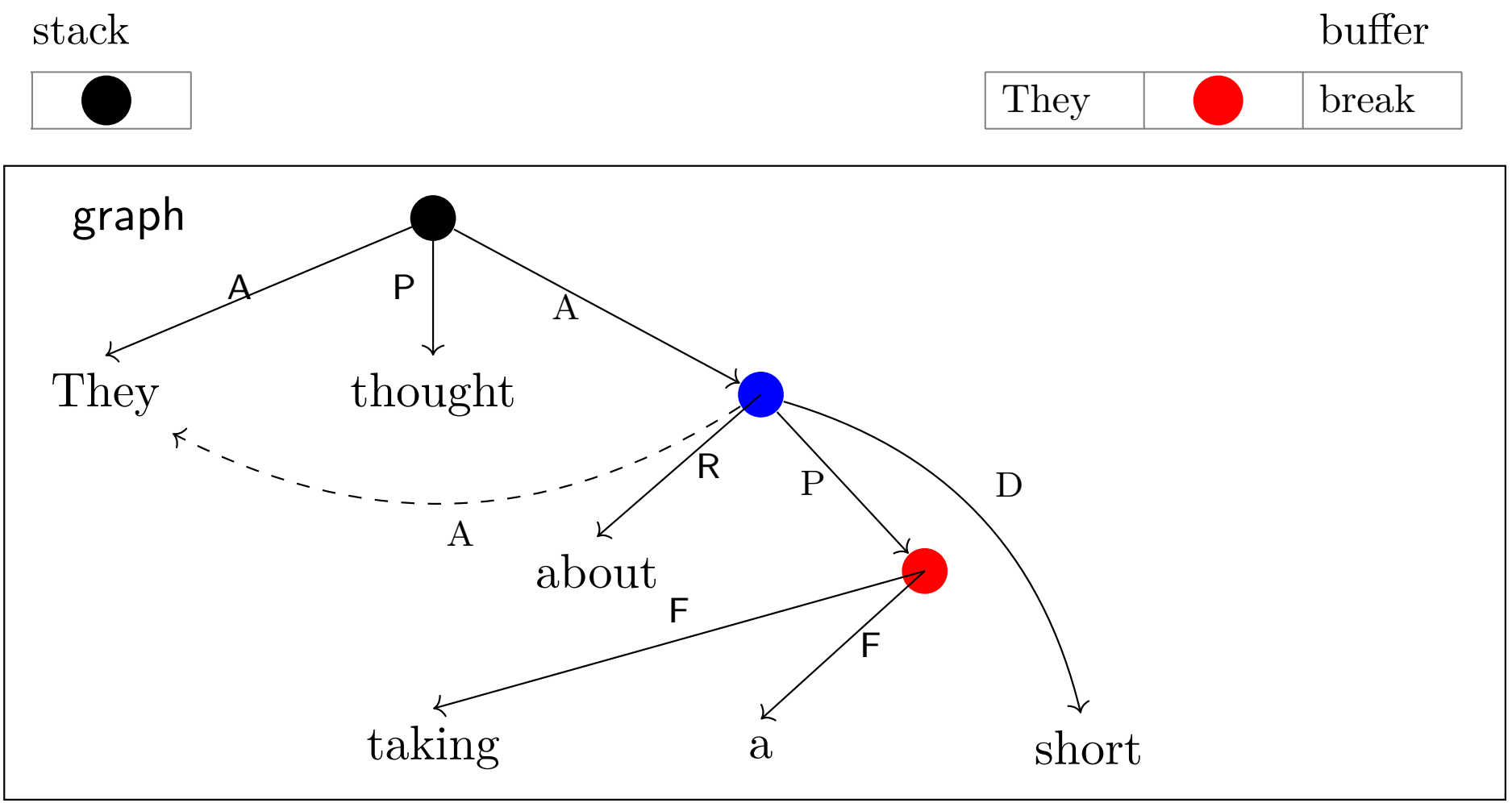
Example: TUPA Transition Sequence

$\Rightarrow$ RIGHT-EDGE$_A$



Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE

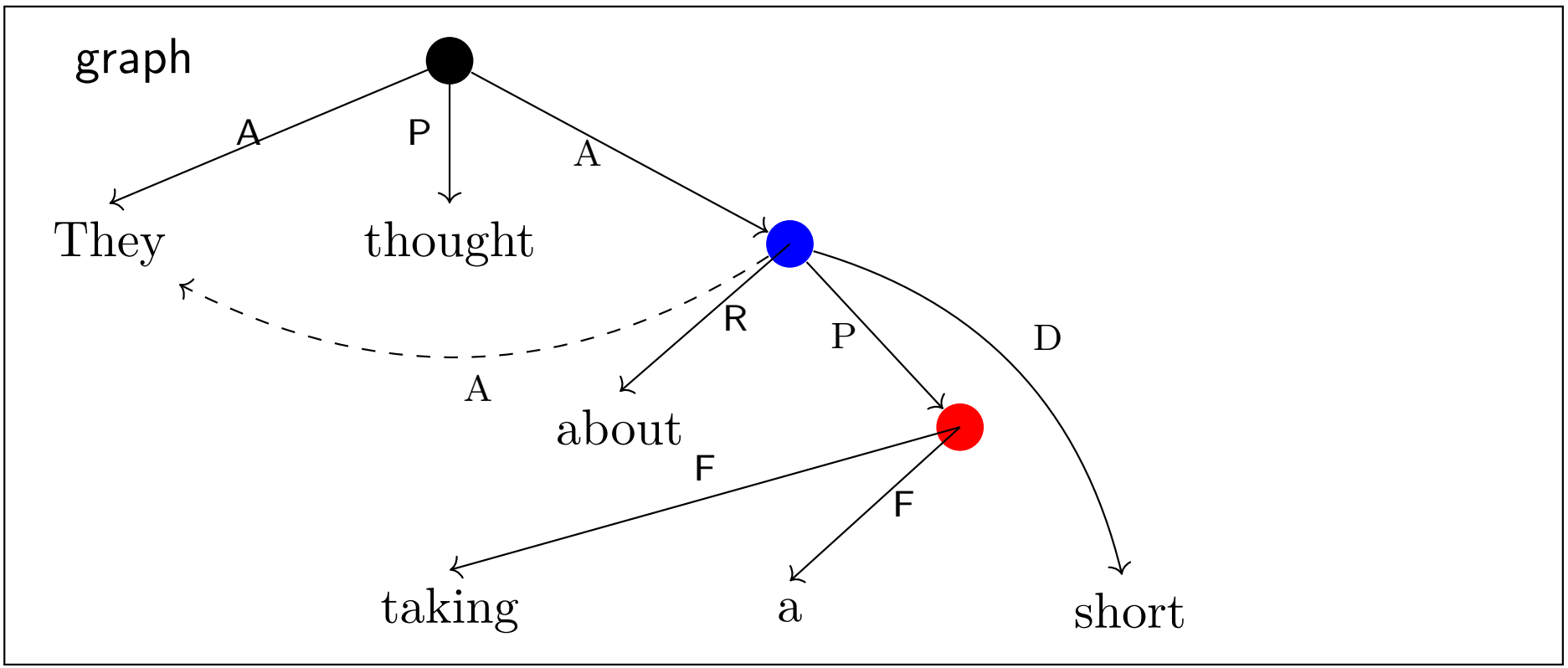


Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE

stack

buffer



Example: TUPA Transition Sequence

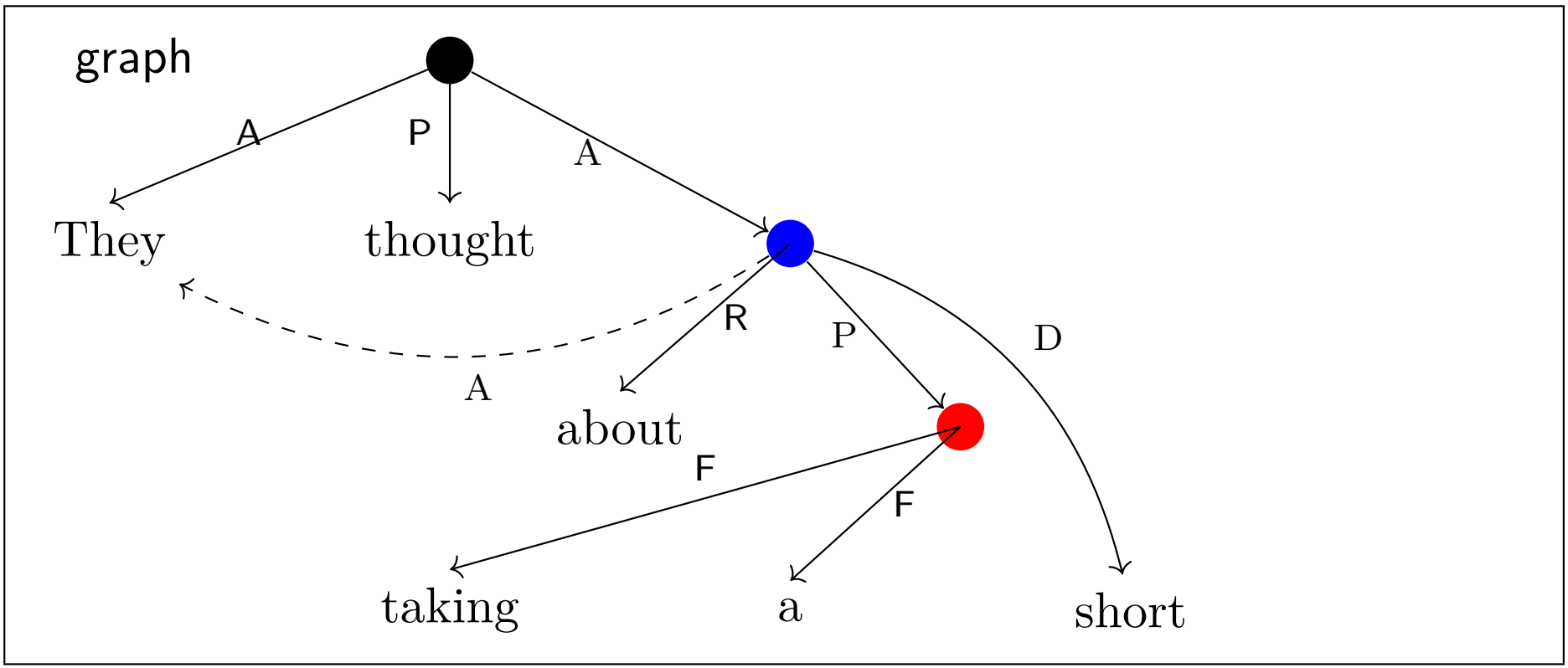
$\Rightarrow$ SHIFT

stack

They

buffer

	break

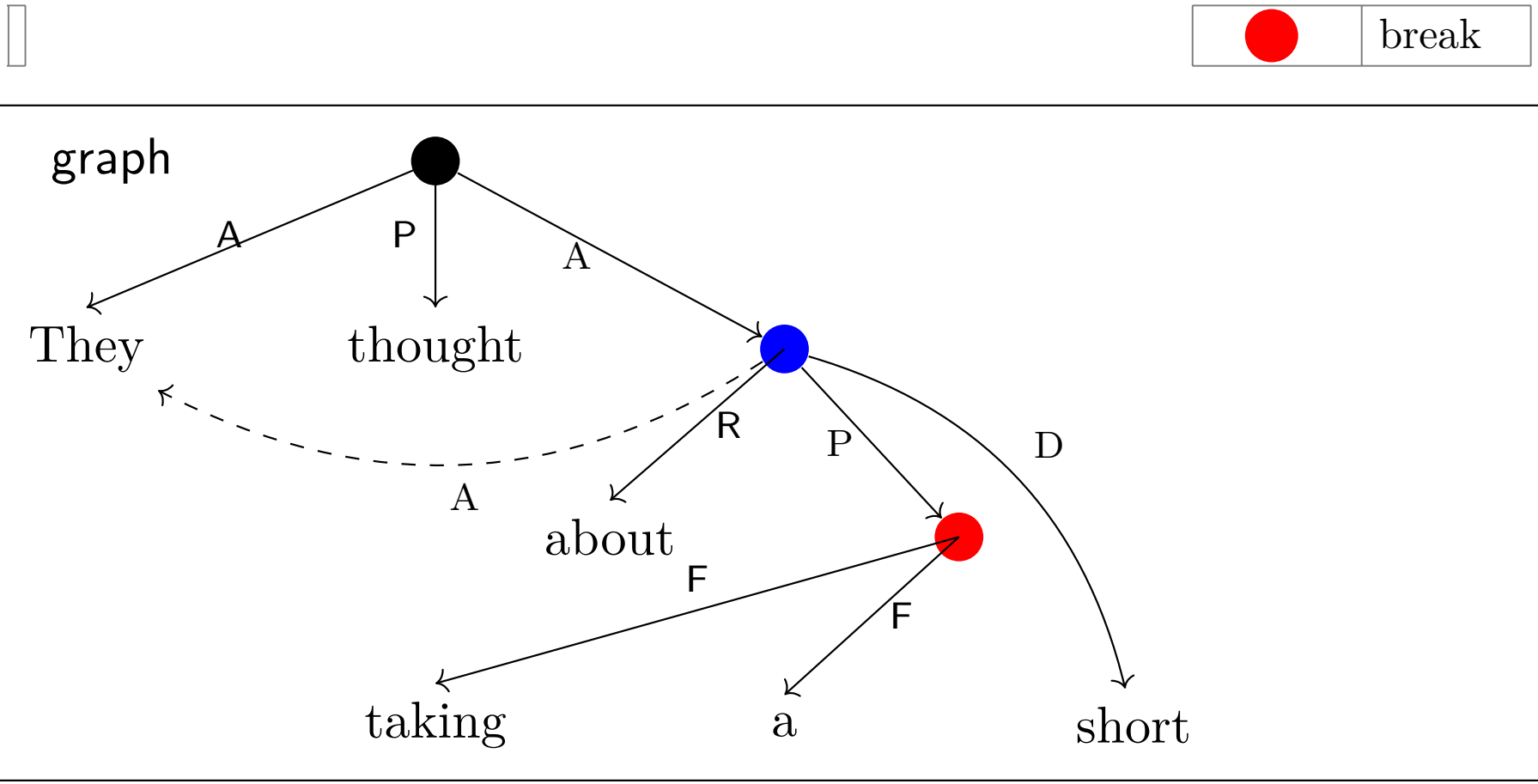


Example: TUPA Transition Sequence

$\Rightarrow$ REDUCE

stack

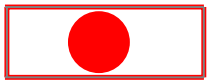
buffer



Example: TUPA Transition Sequence

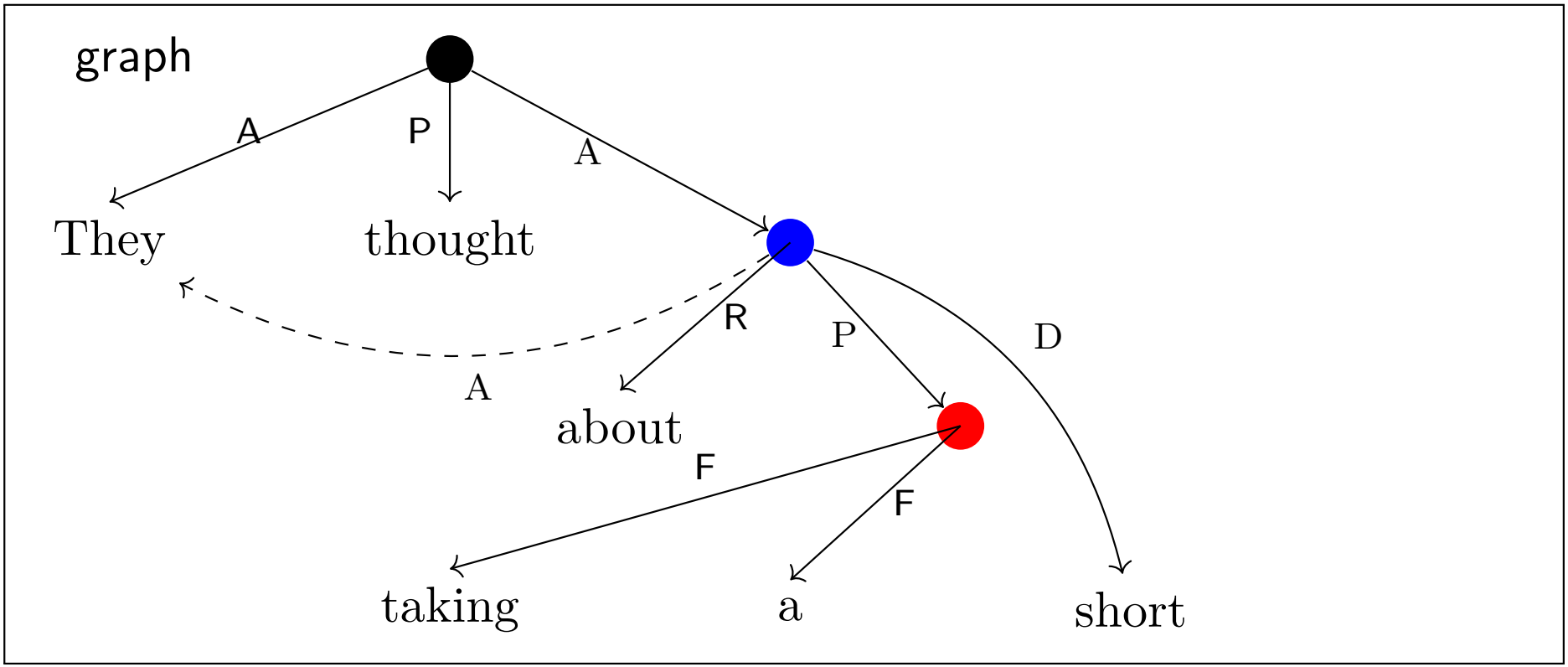
$\Rightarrow$ SHIFT

stack



buffer

break

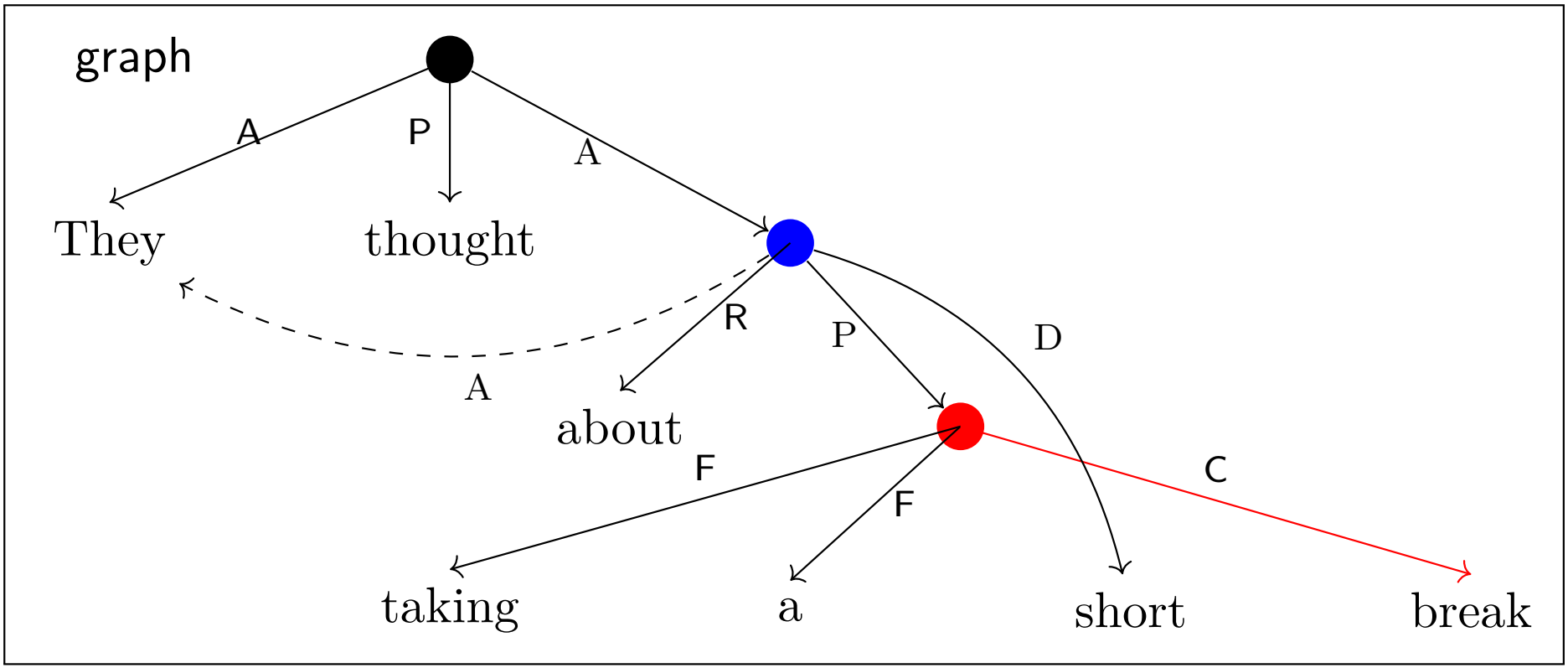


Example: TUPA Transition Sequence

$\Rightarrow$ RIGHT-EDGE$_C$

stack

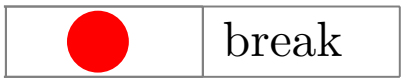
buffer



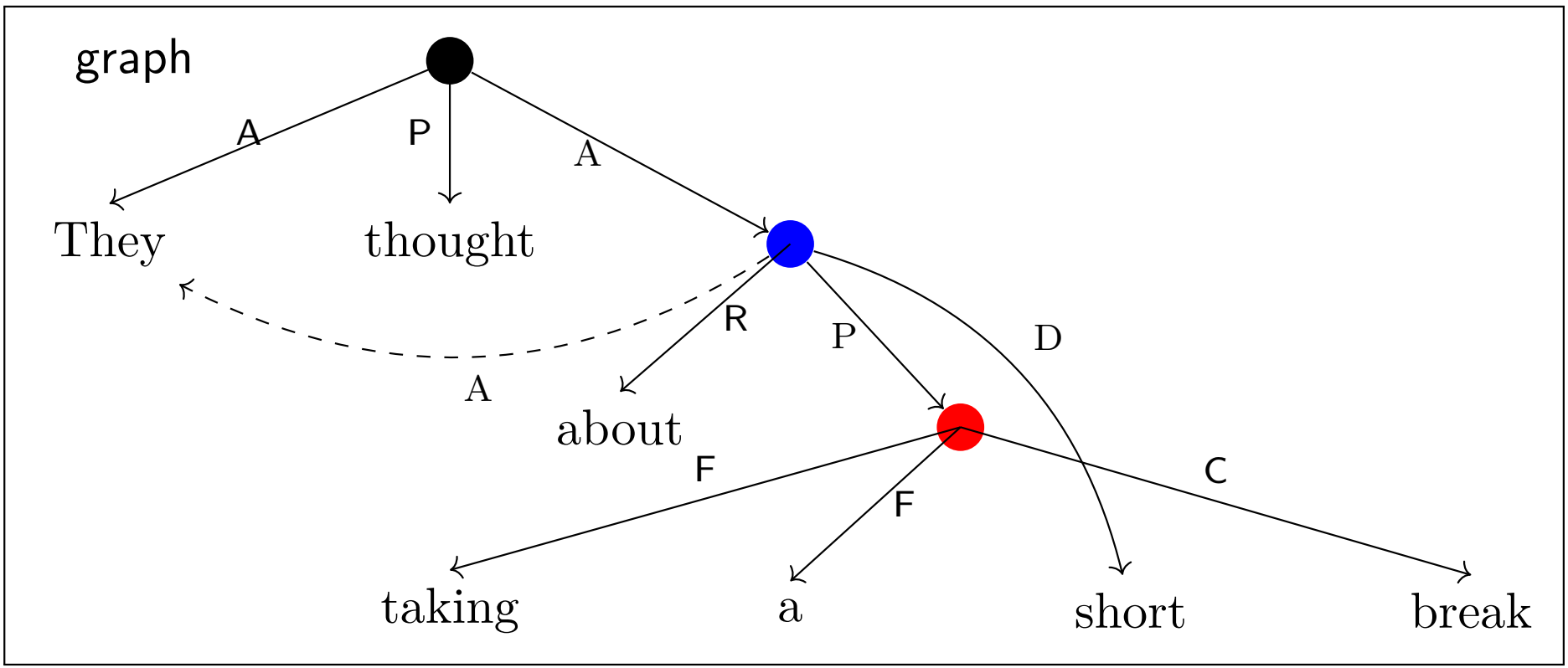
Example: TUPA Transition Sequence

$\Rightarrow$ FINISH

stack

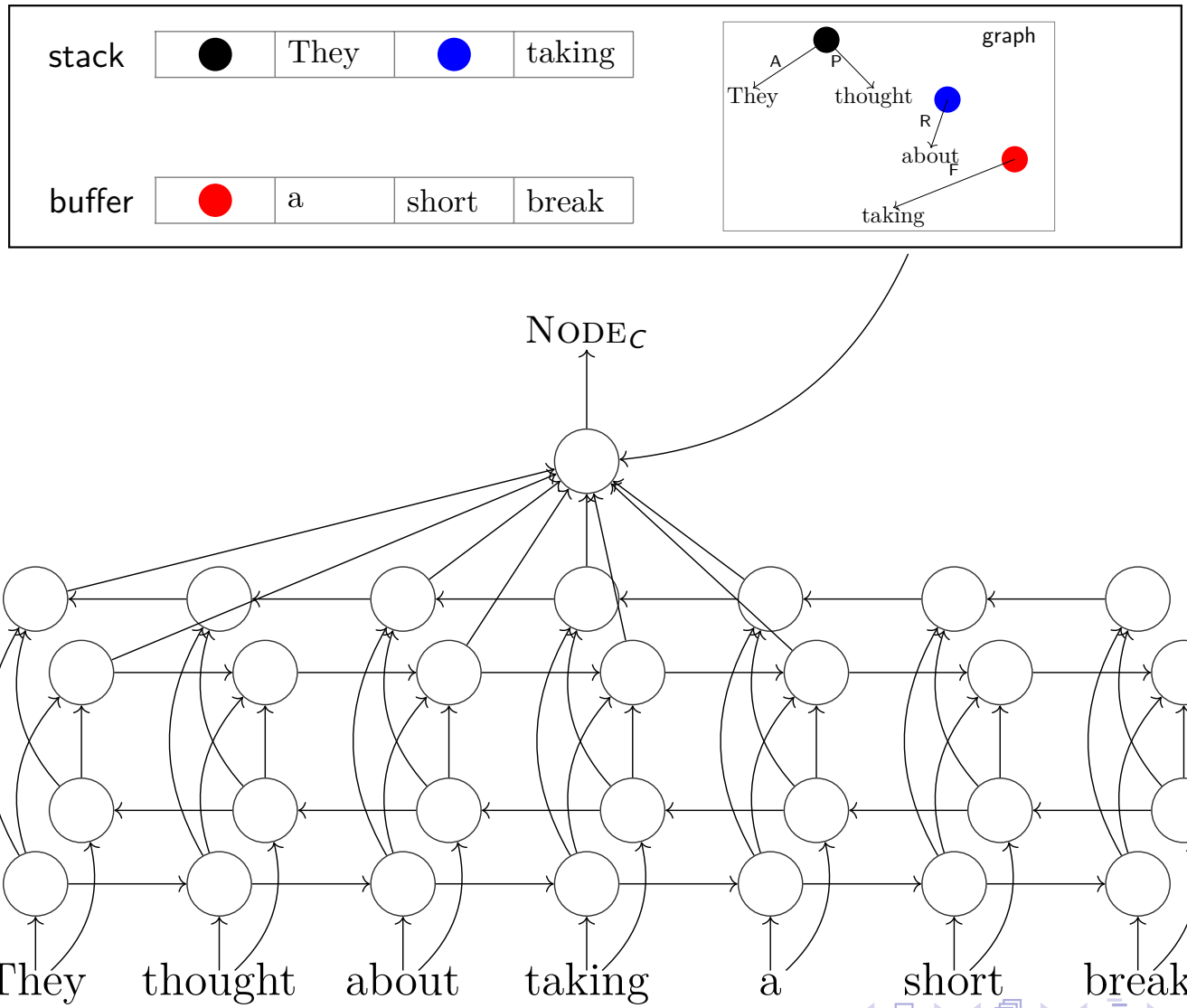


buffer



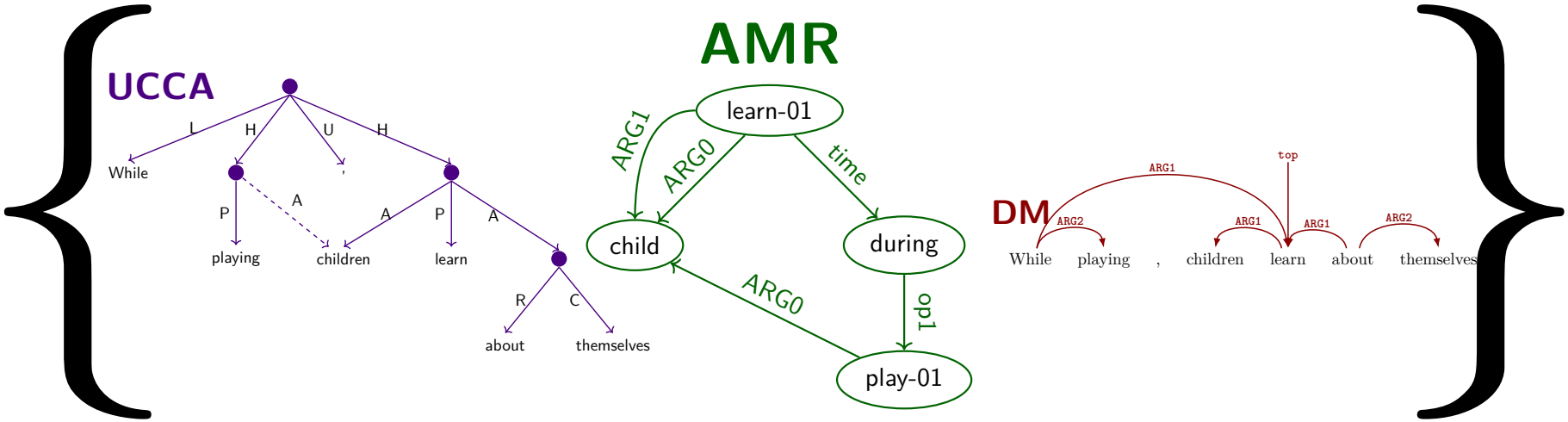
TUPA model

Learns to predict next transition based on current state.



Sharing for better generalization

Multitask Parsing Across Semantic Representations (2018)



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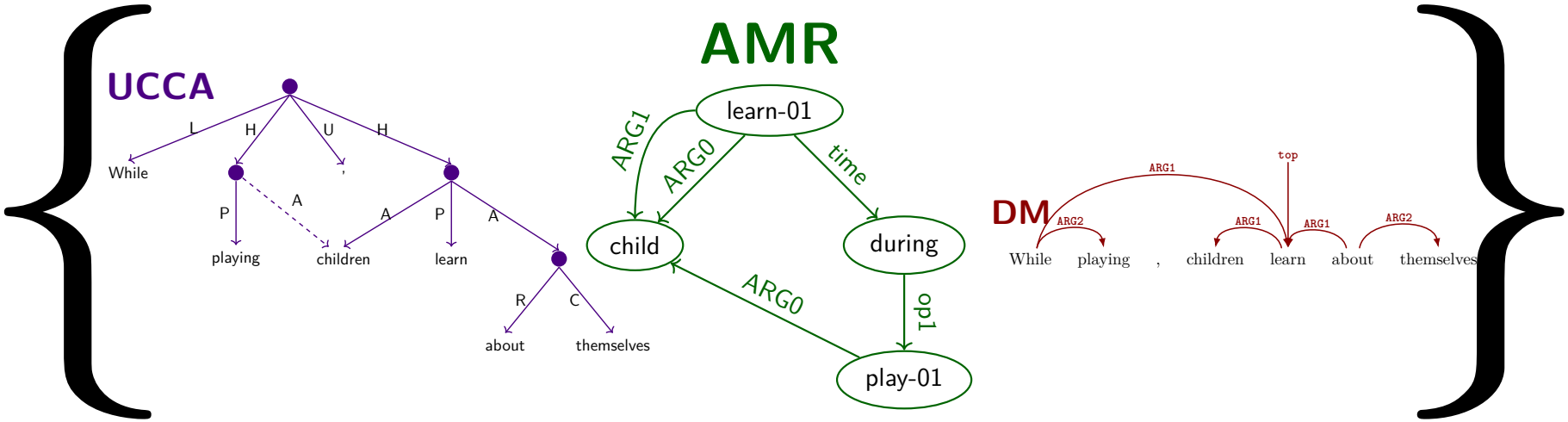
Multitask Parsing Across Semantic Representations (2018)



Improved UCCA parsing in English, French and German.