

Problematic Example

Resolving $\downarrow a$.

Single Scope Stack (current)

After $\downarrow()$ /60:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / 60, \diamond)$$

After $\downarrow()$ /54:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / (\diamond \cdot 60) \cdot \downarrow () / (\diamond \cdot 54), \diamond)$$

After the first $\uparrow()$ /●:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / (\diamond \cdot 60), \diamond \cdot 54)$$

After the second $\uparrow()$ /●:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond \cdot 60)$$

Alternative 1: With DROP

After the first **DROP**:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow x, \diamond)$$

After $\uparrow x$:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond)$$

At this point, the scope stack is empty, we cannot **JUMP**, and resolution fails.

Alternative 2: No DROP

After $\uparrow x$:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond \cdot 60)$$

After **JUMP**:

$$(\dots \cdot 60, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond)$$

We ended up in scope 60 of the inner argument $o2$, instead of scope 54 of the outer argument $o1$.

Scope Context (proposed)

After $\downarrow()$ /60:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / (\diamond \cdot 60[\diamond]), \diamond \cdot \diamond)$$

After $\downarrow()$ /54:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / (\diamond \cdot 60[\diamond]) \cdot \downarrow () / (\diamond \cdot 54[\diamond]), \diamond \cdot \diamond)$$

After the first $\uparrow()$ /●:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow () / (\diamond \cdot 60[\diamond]), \diamond \cdot (\diamond \cdot 54[\diamond]))$$

After the second $\uparrow()$ /●:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond \cdot (\diamond \cdot 54[\diamond]) \cdot (\diamond \cdot 60[\diamond]))$$

After the first **DROP**:

$$(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot \downarrow x, \diamond \cdot (\diamond \cdot 54[\diamond]))$$

After $\uparrow x$:

$$\left(\dots, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \diamond \cdot (\diamond \cdot 54[\widehat{\diamond^a}]) \right)$$

After **JUMP**:

$$\left(\dots \cdot 54, \langle \rangle \cdot \downarrow a \cdot \downarrow \cdot, \widehat{\diamond^a} \right)$$