

## es-hist-is-concat<sup>0,22</sup>

$\forall ds:x:\text{Id fp} \rightarrow \text{Type}, da:k:\text{Knd fp} \rightarrow \text{Type}, es:\text{ES}, i:\text{Id}, LL:(\text{event-info}(ds;da) \text{ List}) \text{ List}, e_1,$   
 $e_2:\{e:\text{E} \mid \text{loc}(e) = i\}, L:\text{event-info}(ds;da) \text{ List}.$   
 $(\forall L \in LL. \neg L = \text{nil})$   
 $\Rightarrow \neg L = \text{nil}$   
 $\Rightarrow (\forall x:\text{Id}. \text{vartype}(i;x) \subseteq \rho \text{ } ds(x)?\text{Top})$   
 $\Rightarrow (\forall e:\text{E}. \text{loc}(e) = i \Rightarrow \text{valtype}(e) \subseteq \rho \text{ } da(\text{kind}(e))?\text{Top})$   
 $\Rightarrow \text{es-hist}\{i:1\}(es;e_1;e_2) = (\text{concat}(LL) @ L) \in \text{event-info}(ds;da) \text{ List}$   
 $\Rightarrow (\exists f:(\mathbb{N}_{<\|LL\|+1} \rightarrow \{e:\text{E} \mid \text{loc}(e) = i\}).$   
 $f(0) = e_1 \ \& \ f(\|LL\|) \leq e_2$   
 $\ \& \ (\forall i:\mathbb{N}_{<\|LL\|}. (f(i) < \text{loc } f(i+1)))$   
 $\ \& \ (\forall i:\mathbb{N}_{<\|LL\|}. \text{es-hist}\{i:1\}(es;f(i);\text{pred}(f(i+1))) = LL[i] \in \text{event-info}(ds;da) \text{ List})$   
 $\ \& \ \text{es-hist}\{i:1\}(es;f(\|LL\|);e_2) = L)$