Long-distance interaction between caller and callee

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$t ::=$		term
	v	value
	x	variable
	$t\ t$	application
	provide S as ε in t	provide
$v ::=$		value
	c	constant
	$\lambda x : \tau\ .\ t$	abstraction
$S ::=$		effect handler
	$\varnothing_S$	empty handler
	$S, s = t$	handler extension
$\tau ::=$		type
	κ	type of constants
	$\sigma \to \sigma$	arrow type
$\sigma ::=$		type with effects
	$E\ !\ \tau$	effect annotation
$E ::=$		effect set
	$\varnothing_\varepsilon$	empty effect
	E, ε	effect extension
$\Gamma ::=$		context
	$\varnothing_\Gamma$	empty context
	$\Gamma, x : \tau$	variable binding

Figure 1: Syntax

$$\boxed{\Gamma \vdash t : \sigma}$$

$$\frac{}{\Gamma \vdash c : \varnothing_\varepsilon \ ! \ \kappa} \ (\text{T-Constant})$$

$$\frac{x : \sigma \in \Gamma}{\Gamma \vdash x : \sigma} \ (\text{T-Variable})$$

$$\frac{\Gamma, x : \tau \vdash t : \sigma}{\Gamma \vdash \lambda x : \tau \ . \ t : \tau \to \sigma} \ (\text{T-Abstraction})$$

$$\frac{\Gamma \vdash t_1 : E_1 \ ! \ \tau_1 \qquad \Gamma \vdash t_2 : E_2 \ ! \ (\tau_1 \to E_3 \ ! \ \tau_2)}{\Gamma \vdash t_2 \ t_1 : E_1, E_2, E_3 \ ! \ \tau_2} \ (\text{T-Application})$$

$$\frac{\Gamma \vdash t : E \ ! \ \tau}{\Gamma \vdash t : E, \varepsilon \ ! \ \tau} \ (\text{T-Weaken})$$

$$\frac{\begin{array}{c} S = \{s_1 = t_1, \ldots, s_n = t_n\} \\ \Gamma \vdash t_i : E_i \ ! \ \tau_i \\ \sigma_i = E_i, \varepsilon \ ! \ \tau_i \\ \Phi(\varepsilon) = \{s_1 = \sigma_1, \ldots, s_n = \sigma_n\} \\ \Gamma, s_1 : \sigma_1, \ldots, s_n : \sigma_n \vdash t : E \ ! \ \tau \end{array}}{\Gamma \vdash \text{provide } S \text{ as } \varepsilon \text{ in } t : E - \varepsilon \ ! \ \tau} \ (\text{T-Provide})$$

Figure 2: Typing rules

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