**Definition** (Semantics of MCDP). Given an MCDP in algebraic form  $\langle \mathcal{A}, \mathsf{T}, \boldsymbol{v} \rangle$ ,

## the semantics $\varphi[\![\langle \mathcal{A}, \mathsf{T}, \boldsymbol{v} \rangle]\!] \in \mathbf{DP}$

is defined as follows:

$$arphi \llbracket \langle \mathcal{A}, \mathsf{ser} 
Glecker$$

$$\varphi[\![\langle\mathcal{A},\mathsf{se}$$

$$\varphi[\![\langle \mathcal{A}, \mathsf{series}(\mathsf{T}_1, \mathsf{T}_2), \boldsymbol{v} \rangle]\!] := \varphi[\![\langle \mathcal{A}, \mathsf{T}_1, \boldsymbol{v} \rangle]\!] \otimes \varphi[\![\langle \mathcal{A}, \mathsf{T}_2, \boldsymbol{v} \rangle]\!],$$
$$\varphi[\![\langle \mathcal{A}, \mathsf{par}(\mathsf{T}_1, \mathsf{T}_2), \boldsymbol{v} \rangle]\!] := \varphi[\![\langle \mathcal{A}, \mathsf{T}_1, \boldsymbol{v} \rangle]\!] \otimes \varphi[\![\langle \mathcal{A}, \mathsf{T}_2, \boldsymbol{v} \rangle]\!],$$

 $\varphi[\![\langle \mathcal{A}, \mathsf{loop}(\mathsf{T}), \boldsymbol{v} \rangle]\!] := \varphi[\![\langle \mathcal{A}, \mathsf{T}, \boldsymbol{v} \rangle]\!]^{\dagger}.$ 

 $\varphi[\langle \mathcal{A}, a, \boldsymbol{v} \rangle] := \boldsymbol{v}(a), \quad \text{for all } a \in \mathcal{A},$