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:

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

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

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

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