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:

$$\begin{aligned}
\varphi[\![\langle \mathcal{A}, a, \boldsymbol{v} \rangle]\!] &:= \boldsymbol{v}(a), \qquad \text{for all } a \in \mathcal{A}, \\
\varphi[\![\langle \mathcal{A}, \mathsf{series}(\mathsf{T}_1, \mathsf{T}_2), \boldsymbol{v} \rangle]\!] &:= \varphi[\![\langle \mathcal{A}, \mathsf{T}_1, \boldsymbol{v} \rangle]\!] \circledcirc \varphi[\![\langle \mathcal{A}, \mathsf{T}_2, \boldsymbol{v} \rangle]\!], \\
\varphi[\![\langle \mathcal{A}, \mathsf{par}(\mathsf{T}_1, \mathsf{T}_2), \boldsymbol{v} \rangle]\!] &:= \varphi[\![\langle \mathcal{A}, \mathsf{T}_1, \boldsymbol{v} \rangle]\!] \otimes \varphi[\![\langle \mathcal{A}, \mathsf{T}_2, \boldsymbol{v} \rangle]\!], \\
\varphi[\![\langle \mathcal{A}, \mathsf{loop}(\mathsf{T}), \boldsymbol{v} \rangle]\!] &:= \varphi[\![\langle \mathcal{A}, \mathsf{T}, \boldsymbol{v} \rangle]\!]^{\dagger}.
\end{aligned}$$