

frd.1 Frames

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Definition frd.1. A *frame* is a pair $\mathfrak{F} = \langle W, R \rangle$ where W is a non-empty set of worlds and R a binary relation on W . A model \mathfrak{M} is *based on* a frame $\mathfrak{F} = \langle W, R \rangle$ if and only if $\mathfrak{M} = \langle W, R, V \rangle$ for some valuation V .

Definition frd.2. If \mathfrak{F} is a frame, we say that φ is *valid in* \mathfrak{F} , $\mathfrak{F} \vDash \varphi$, if $\mathfrak{M} \Vdash \varphi$ for every model \mathfrak{M} based on \mathfrak{F} .

If \mathcal{F} is a class of frames, we say φ is *valid in* \mathcal{F} , $\mathcal{F} \vDash \varphi$, iff $\mathfrak{F} \vDash \varphi$ for every frame $\mathfrak{F} \in \mathcal{F}$.

The reason frames are interesting is that correspondence between schemas and properties of the accessibility relation R is at the level of frames, *not of models*. For instance, although T is true in all reflexive models, not every model in which T is true is reflexive. However, it *is* true that not only is T *valid* on all reflexive *frames*, also every frame in which T is valid is reflexive.

Remark 1. Validity in a class of frames is a special case of the notion of validity in a class of models: $\mathcal{F} \vDash \varphi$ iff $\mathcal{C} \vDash \varphi$ where \mathcal{C} is the class of all models based on a frame in \mathcal{F} .

Obviously, if a *formula* or a schema is valid, i.e., valid with respect to the class of *all* models, it is also valid with respect to any class \mathcal{F} of frames.

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Bibliography