

BFO 2020 Existence Instantiation Axioms

(1) Particulars exist at some time

$$\forall p(\text{particular}(p) \rightarrow \exists t \text{existsAt}(p,t))$$

(2) If m is a material entity, then there is some one dimensional temporal region during which m exists

$$\begin{aligned} \forall m (\exists t \text{instanceOf}(m, \text{materialEntity}, t) \\ \rightarrow \exists t (\text{instanceOf}(t, \text{oneDimensionalTemporalRegion}, t) \wedge \text{existsAt}(m, t))) \end{aligned}$$

(3) Relata of exists at are particulars.

$$\forall i, t (\text{existsAt}(i, t) \rightarrow \text{particular}(i) \wedge \text{particular}(t) \wedge \text{instanceOf}(t, \text{temporalRegion}, t))$$

(4) Instance of is disjunctive on third argument, a temporal region

$$\forall p, q, r, s (\text{instanceOf}(p, q, r) \wedge \text{temporalPartOf}(s, r) \rightarrow \text{instanceOf}(p, q, s))$$

(5) There is always something that exists

$$\begin{aligned} \forall t (\text{instanceOf}(t, \text{temporalRegion}, t) \\ \rightarrow \exists u, i (i \neq t \wedge \text{universal}(u) \wedge \text{particular}(i) \wedge \text{instanceOf}(i, u, t))) \end{aligned}$$

(6) Exists at is disjunctive on first argument when it is a continuant

$$\forall p, q, r (\text{existsAt}(p, q) \wedge \text{continuantPartOf}(r, p, q) \rightarrow \text{existsAt}(r, q))$$

(7) If you exist you instantiate a universal and vice versa

$$\begin{aligned} \forall a, t (\exists u (\text{universal}(u) \wedge \text{instanceOf}(a, u, t) \wedge \text{instanceOf}(t, \text{temporalRegion}, t)) \\ \leftrightarrow \text{particular}(a) \wedge \text{instanceOf}(t, \text{temporalRegion}, t) \wedge \text{existsAt}(a, t)) \end{aligned}$$

(8) Relata of instance of are particular, universal, temporal region.

$$\forall i, u, t (\text{instanceOf}(i, u, t) \rightarrow \text{particular}(i) \wedge \text{universal}(u) \wedge \text{instanceOf}(t, \text{temporalRegion}, t))$$

(9) Every universal is instantiated at least once

$$\forall u (\text{universal}(u) \rightarrow \exists p, t \text{instanceOf}(p, u, t))$$