Definition (Series composition). Let $f : A \nrightarrow B$ and $g : B \nrightarrow C$ be design problems. We define their *series composition* $(f \fatsemi g) : A \nrightarrow C$ as:

$$(f \fatsemi g) : A^{\mathrm{op}} \times C \to_{\mathbf{Pos}} \mathbf{Bool},$$
$$\langle a^*, c \rangle \mapsto \bigvee_{b \in B} f(a^*, b) \wedge g(b^*, c).$$

Alternatively:

$$(f \fatsemi g) : A^{\mathrm{op}} \times C \to_{\mathbf{Pos}} \mathbf{Bool},$$
$$\langle a^*, c \rangle \mapsto \bigvee_{b_1 \leq b_2, b_1, b_2 \in B} f(a^*, b_1) \wedge g(b_2{}^*, c).$$