

# Identities in higher categories

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If  $D$  is a direct category, type-valued "Reedy fibrant" presheaves over  $D$  can be described by types and type families (Makkai, Shulman). A standard example is the case where  $D$  is the semi-simplex category (nonempty finite sets and increasing functions); presheaves over this category are known as "semi-simplicial types". By equipping a semi-simplicial type with the Segal condition, one gets a type-theoretic definition of an infinity-semicategory. In this setting, degeneracies (i.e. identities) are tricky because the full simplex category is not direct.

I will talk about several different strategies for adding identities: using a direct replacement (Kock, Sattler), directly adding univalent identities (Harpaz, Schreiber, Capriotti), formulating all coherences, and the approach of idempotent equivalences.