3-Morphisms in the Degree 2 Degeneracy Maps of Street Nerves

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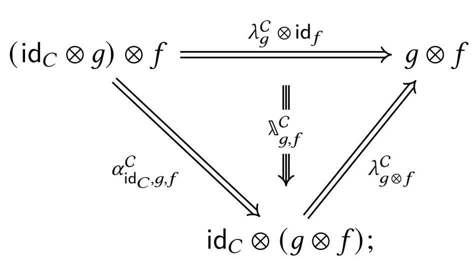
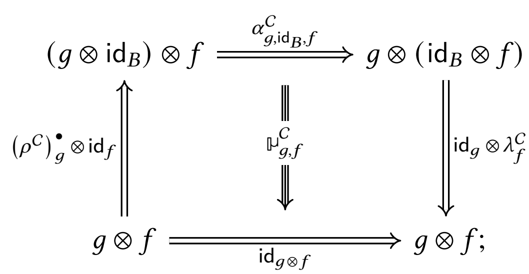
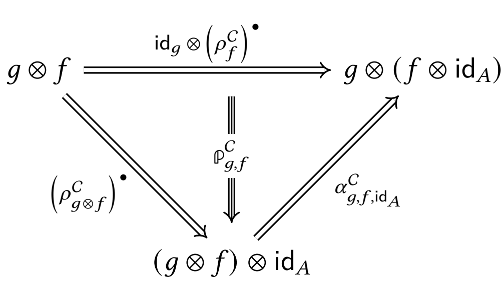
1 Preliminaries

First recall that the components of the left, middle, and right 2-unitors of C are invertible 3-morphisms of the form

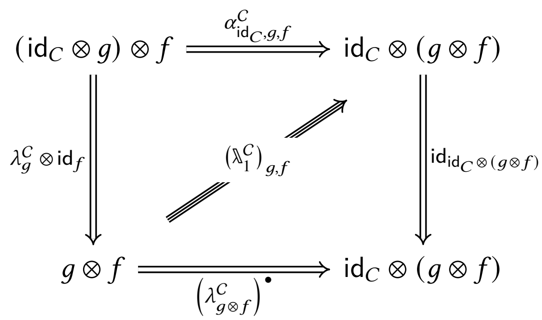


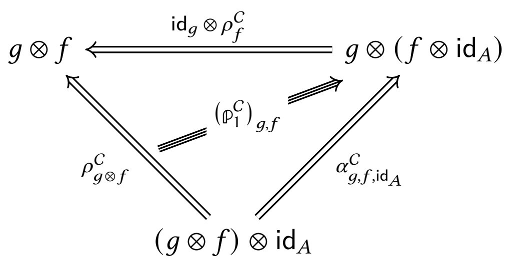


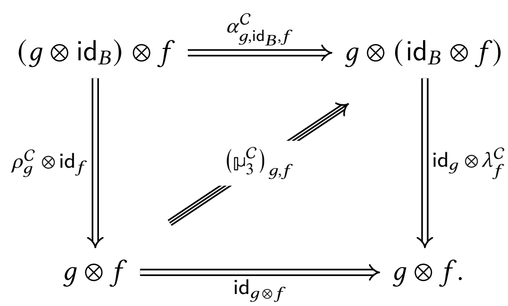


2 Extra 2-Unitors

The left, middle, and right 2-unitors of C induce the following 'extra 2-unitors':



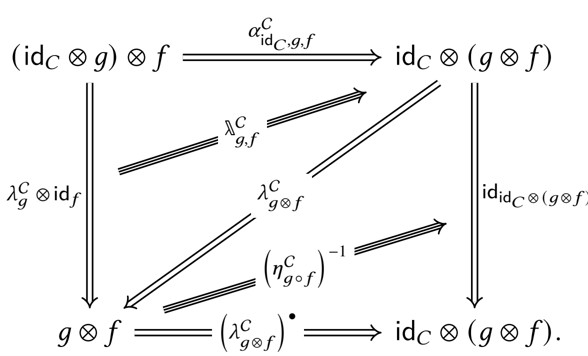




These are all pastings. Here are their constructions:

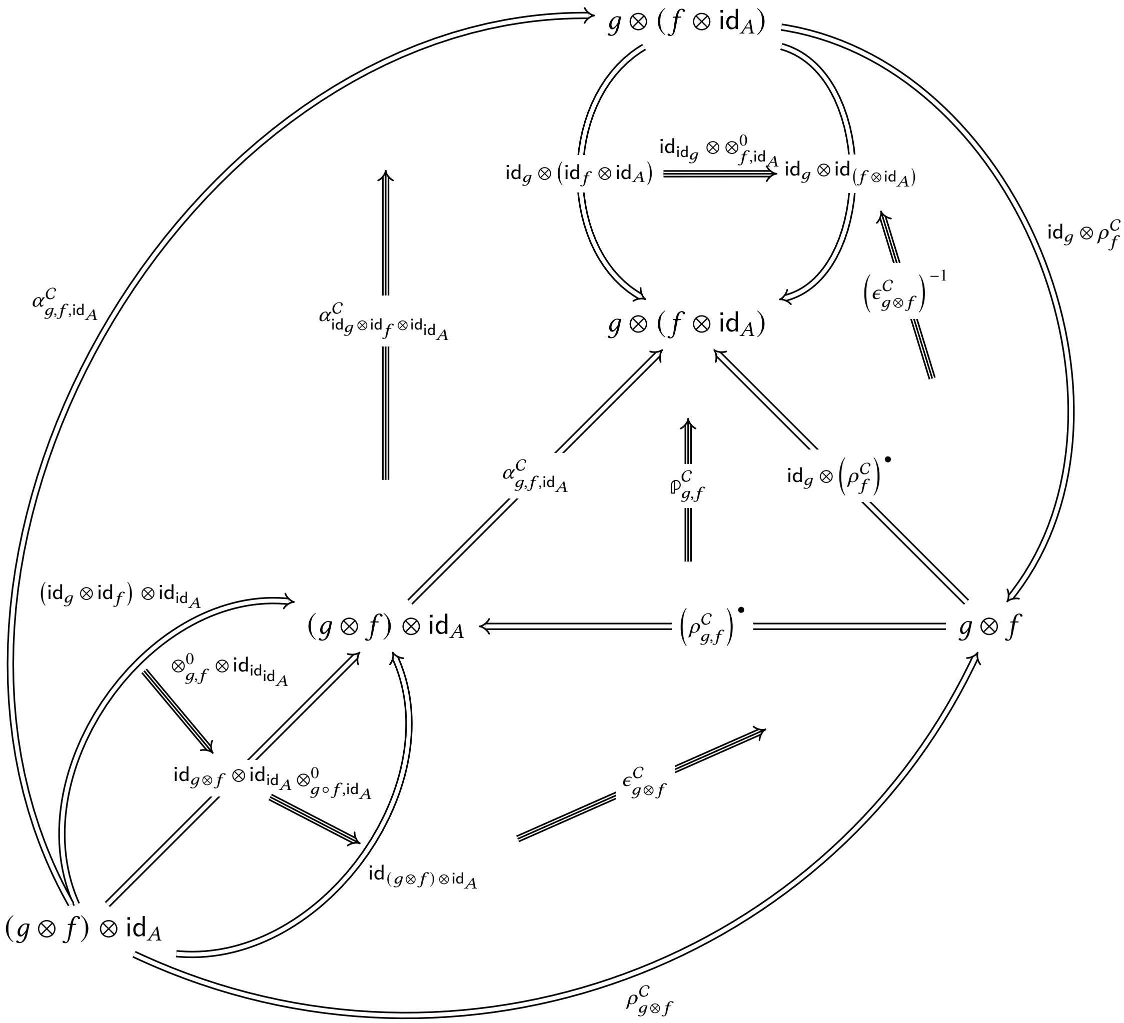
Constructing $\mathbb{\lambda}^C_1$

The component at f of $\mathbb{\lambda}^C_1$ is given by the pasting of the following diagram:



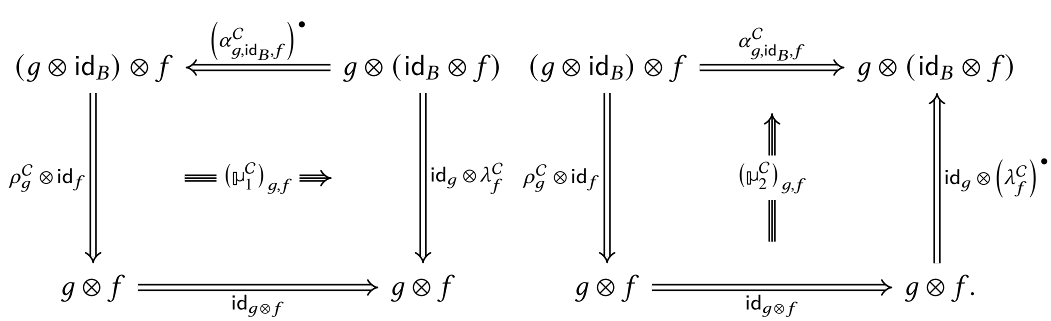
Constructing $\mathbb{\rho}^C_1$

The component at f of $\mathbb{p}_1^C$ is given by the pasting of the following diagram:

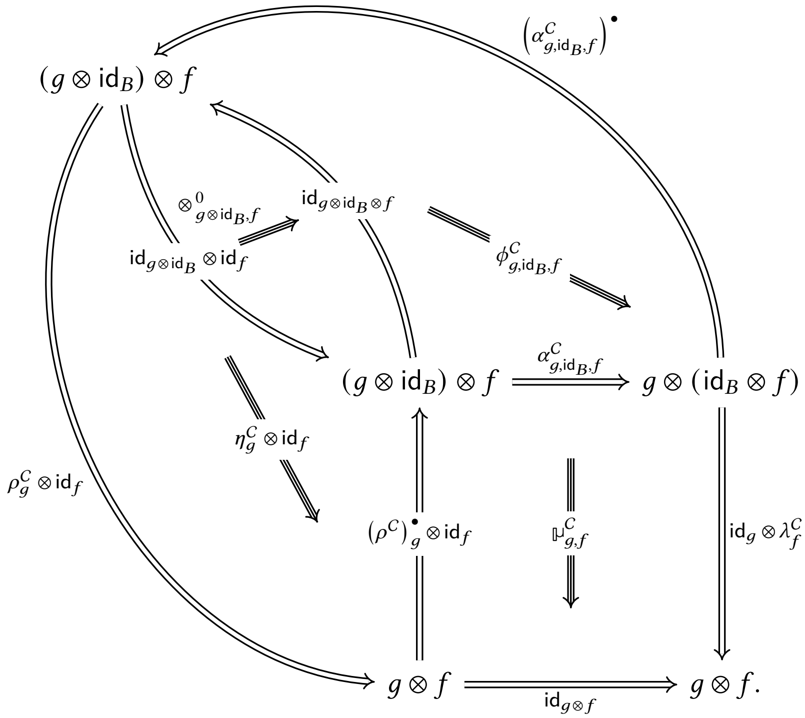


Constructing $\mathbb{\mu}_3^C$

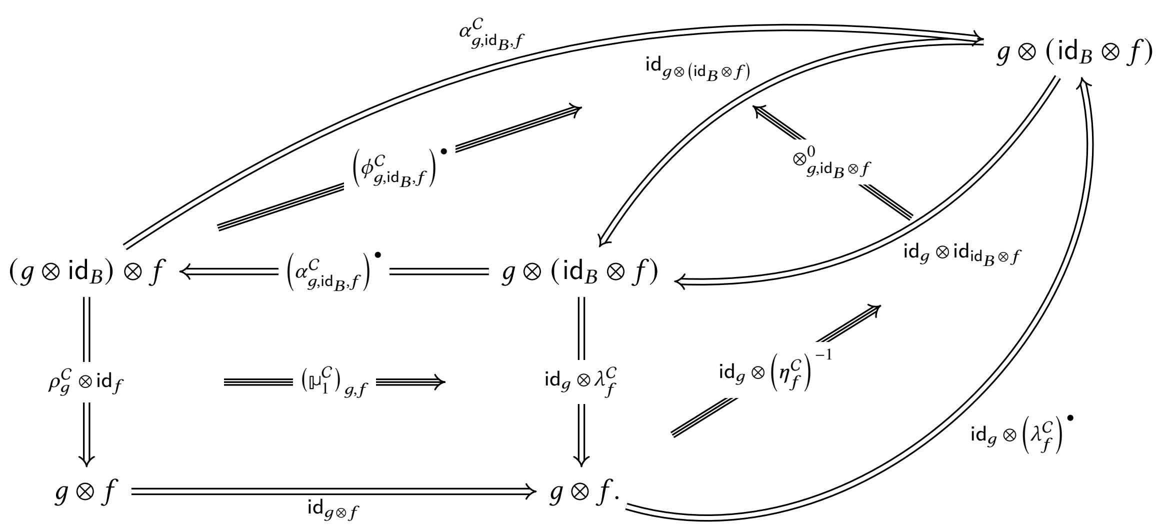
To construct $\mathbb{\mu}_3^C$, we first define invertible 3-morphisms $\mathbb{\mu}_1^C$ and $\mathbb{\mu}_2^C$ as in the diagrams



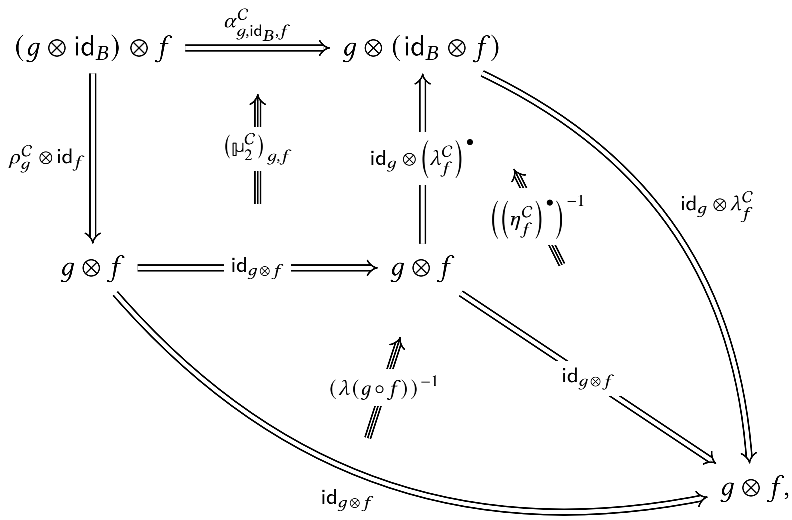
1. $\mu_1^{\mathcal{C}}$: The component at f of $\mu_1^{\mathcal{C}}$ is given by the following pasting diagram:



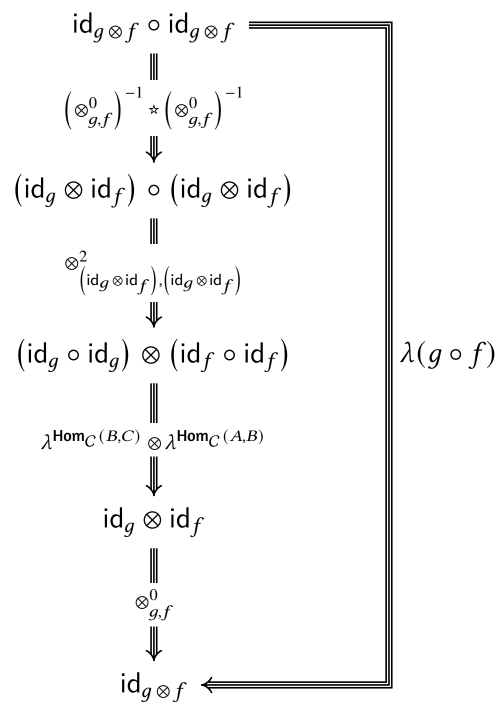
2. $\mu_2^{\mathcal{C}}$: The component at f of $\mu_2^{\mathcal{C}}$ is given by the following pasting diagram:



3. μ_3^C: The component at f of μ_3^C is given by the pasting of the diagram



in $\mathbf{Hom}_C[A, C]$, where $\lambda(g \circ f)\colon \left(\mathrm{id}_{g\otimes f} \circ \mathrm{id}_{g \otimes f}\right) \Longrightarrow \mathrm{id}_{g\otimes f}$ is the invertible 3-morphism defined as the composition

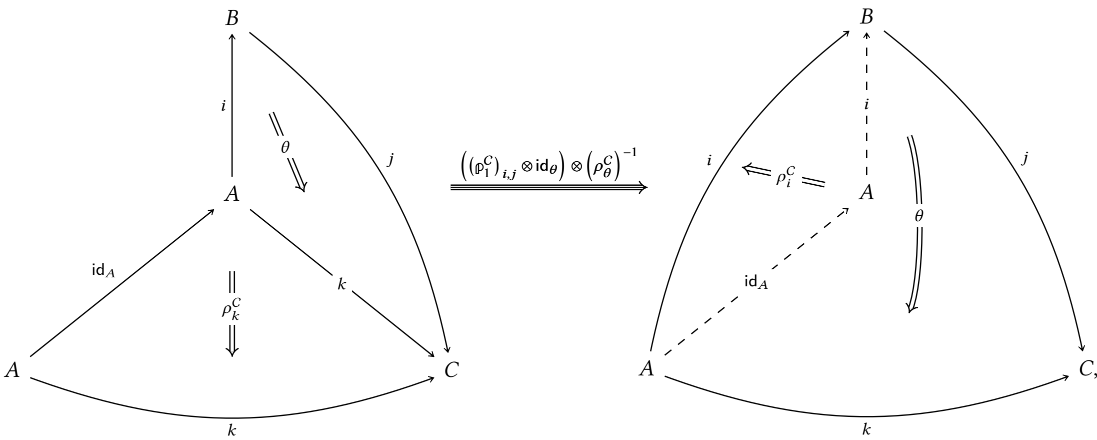


in $\mathbf{Hom}_C(B, C) \times \mathbf{Hom}_C(A, B)$.

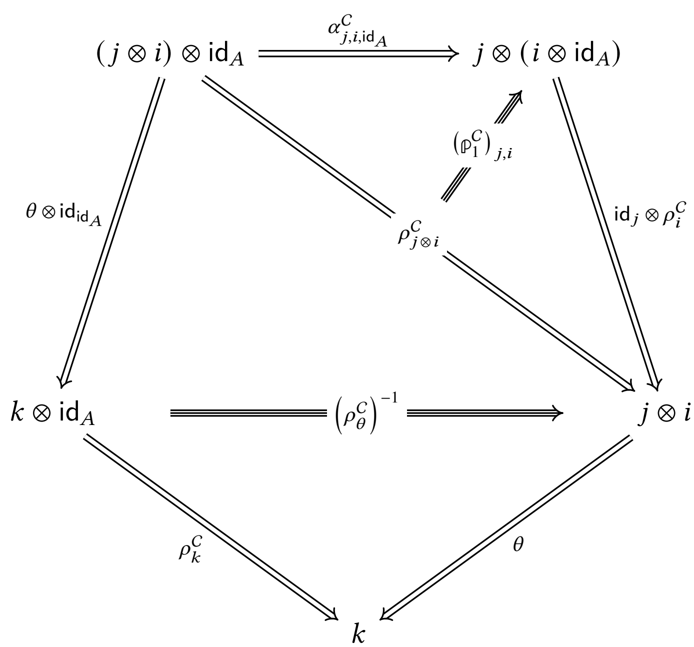
3 The 3-Morphisms in the Degree 2 Degeneracy Maps of the Street Nerve

3.1 $s_0^2(\sigma)$

$s_0^2(\sigma) =$

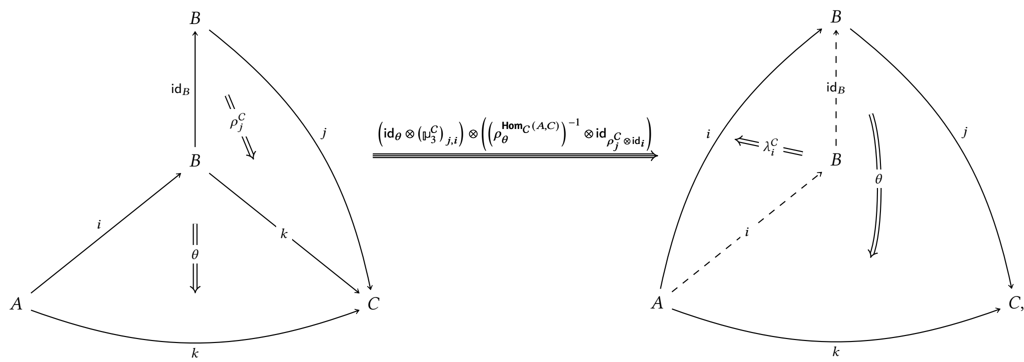


where $\left(\left(\wp_1^C\right)_{i,j} \otimes \mathsf{id}_\theta\right) \otimes \left(\rho_\theta^C\right)^{-1}$ is the pasting of the diagram

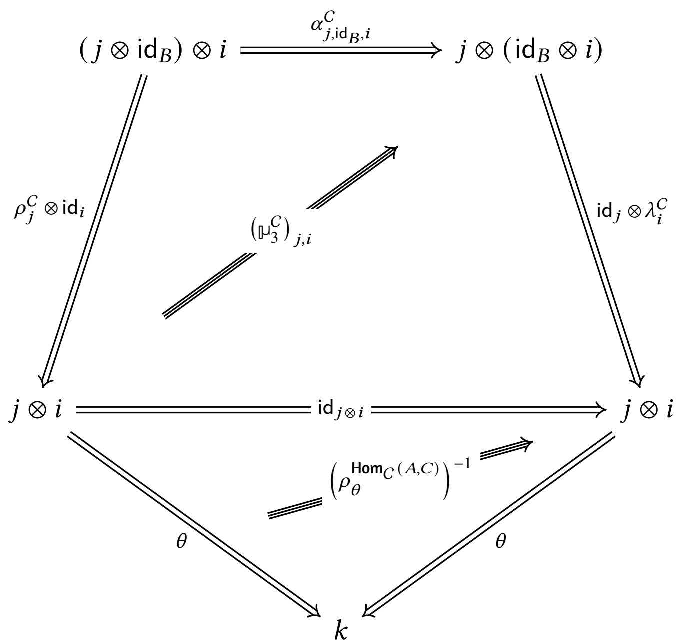


3.2 $s_1^2(\sigma)$

$s_1^2(\sigma) =$

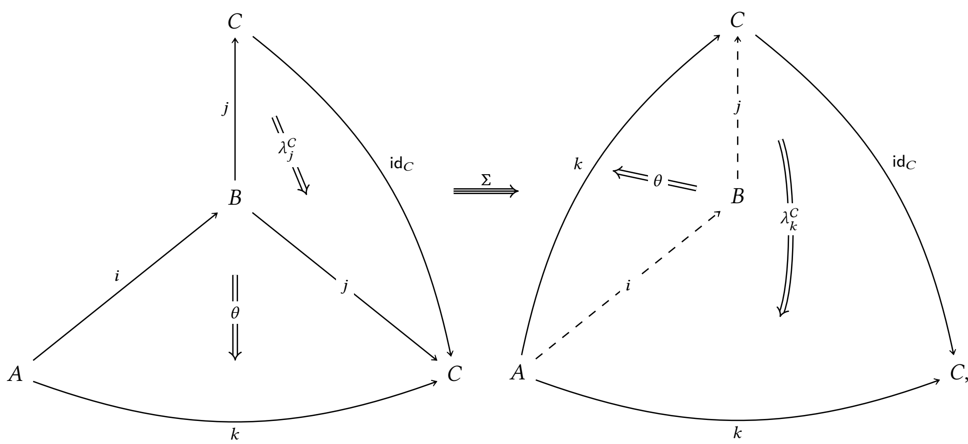


where $\left(\mathrm{id}_\theta \otimes (\mathbb{\mu}_3^C)_{j,i}\right) \otimes \left(\left(\rho_\theta^{\mathsf{Hom}_C(A,C)}\right)^{-1} \otimes \mathrm{id}_{\rho_j^C \otimes \mathrm{id}_i}\right)$ is the pasting of the diagram



3.3 $s_2^2(\sigma)$

$s_2^2(\sigma) =$



where Σ is the pasting of the diagram