Consider two supervised learning algorithms which search over sets of functions $A \to B$ parametrized by spaces $P, Q$ to find the best approximations to some ideal functions $f, g : A \to B$. A supervised transfer learning algorithm is a meta learning algorithm which searches over a set of functions $B^A \to B^A$ parametrized by a space $Q$ to find the best approximation to some ideal function $\alpha : B^A \to B^A$.

We endow additional structure to the 2-cells in the weak 2-category $\text{Learn}$ of open learners between sets [Fong, Spivak, Tuyéras] in order to construct a full and faithful symmetric monoidal functor to it from the category $\text{Learn}(A, B)$ of transfer learners between open learners from $A$ to $B$. We show by induction that $\text{Learn}$ is a symmetric monoidal weak $n$-category admitting bimonoids, which yields a canonical equivalence between open learners and higher transfer learners. This provides a structural perspective on meta learning, and hints at a higher approach to lenses, open games, and other structures which model the exchange of information. (Received September 04, 2019)