On double glueing

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The glueing construction in the form of the Freyd covering is a well-known and useful tool in categorical logic. Recently Hyland and Tan showed how a variation of this construction, which they called the double glueing construction, could be used both to produce new models of linear logic and to establish the full completeness of certain existing models. These ideas were further generalized by Masahito Hasegewa in order to establish the full completeness of the translations between certain linear type theories.

This presentation discusses the generalization of these constructions to linearly distributive categories and linear bicategories. These generalized constructions use linear functors rather than the duality present in *-autonomous categories thus providing an added expressiveness to the construction. A particular example of this "double glueing construction" is a hybrid construction between the original double glueing and the Chu construction (which might be called Chu-glue).

These constructions provide new (both simple and non-trivial) examples of linearly distributive categories and bicategories. The basic properties of these glued categories is, of course, determined by the original constituents of the construction. In particular, the existence of linear adjoints (or complements) depends on their presence in the original settings: when they are present, the more general construction can be reduced to the original construction.