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Monads and theories

The equivalence between finitary monads on the category of sets and Lawvere theories has been generalised in many ways. In the present talk, we will be concerned with describing a monad–theory correspondence that arises naturally and universally.

Building on the work of [1], we take our basic setting to be a locally presentable category E equipped with a small dense full subcategory of *arities* A . In this setting we will see that the natural constructions relating monads on E and identity on objects functors out of A form an adjoint pair. The fixed points for the adjunction are what we call *A-nervous* monads – those monads for which the conclusion of Weber’s nerve theorem holds – and *A-theories*, a notion we introduce.

The resulting equivalence between nervous monads and theories captures most known monad–theory correspondences to date as well as new ones, including one that captures the globular theories defining Grothendieck weak ω -groupoids. In addition to introducing the various notions I will describe the good properties of *A-nervous* monads and *A-theories* that make them convenient to work with in practice.

REFERENCES:

- [1] Berger, C., Melliés, P.-A., and Weber, M. Monads with arities and their associated theories *Journal of Pure and Applied Algebra* 216 (2012) 2029–2048.
- [2] Bourke, J. and Garner, R., Monads and theories, *Preprint*: <https://arxiv.org/abs/1805.04346> (2018).

*Joint work with Richard Garner.