▶ SAM SANDERS, *The Biggest Five of Reverse Mathematics*.
Department of Philosophy II, RUB Bochum, Germany.
E-mail: sasander@me.com.
URL Address: http://sasander.wixsite.com/academic.

I provide an overview of joint work with Dag Normann on the higher-order Reverse Mathematics (RM for short) of the Big Five systems and the surprising limits of this enterprise ([3]).

The well-known *Big Five phenomenon* of RM is the observation that a large number of theorems from ordinary mathematics are either provable in the base theory or equivalent to one of only four systems; these five systems together are called the 'Big Five' of RM. The aim of this paper is to **greatly** extend the Big Five phenomenon, working in Kohlenbach's *higher-order* RM ([1]).

In particular, we have established numerous equivalences involving the **second-order** Big Five systems on one hand, and well-known **third-order** theorems from analysis about (possibly) discontinuous functions on the other hand. We both study relatively tame notions, like cadlag or Baire 1, and potentially wild ones, like quasi-continuity. We also show that *slight* generalisations and variations (involving e.g. the notions Baire 2 and cliquishness) of the aforementioned third-order theorems fall *far* outside of the Big Five. In particular, these slight generalisations and variations imply the principle $\mathsf{NIN}_{[0,1]}$ from [2], i.e. there is no injection from $[0,1]$ to $\mathbb{N}$. We have no explanation for this phenomenon.

REFERENCES.

[1] Ulrich Kohlenbach, *Higher order reverse mathematics*, Reverse mathematics 2001, Lect. Notes Log., vol. 21, ASL, 2005, pp. 281–295.
[2] Dag Normann and Sam Sanders, *On the uncountability of* $\mathbb{R}$, Journal of Symbolic Logic, DOI: doi.org/10.1017/jsl.2022.27 (2022), pp. 43.
[3] ———, *The Biggest Five of Reverse Mathematics*, Submitted, arxiv: https://arxiv.org/abs/2212.00489 (2023), pp. 39.