

- ▶ ASSAF SHANI, *Borel equivalence relation and weak choice principles*.

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Using tools from [1] and [2], we develop a relationship between the study of certain Borel equivalence relations and weak choice principles. We show that separation of these choice principles is closely related to questions about equivalence relations, such as Borel irreducibility and ergodicity.

For example, given a countable Borel equivalence relation  $E$  we define the choice principle *countable choice for  $E$ -classes* as “every countable sequence of  $E$ -classes has a choice function”. We show that for countable Borel equivalence relations  $E$  and  $F$ , if  $E$  is  $F$ -ergodic (with respect to some measure), then there is a model which satisfies countable choice for  $F$  classes but not for  $E$  classes. A main ingredient in the proof is showing that if  $E$  is  $F$ -ergodic with respect to  $\mu$ , then  $E^\omega$  is  $F$ -ergodic with respect to the product measure  $\mu^\omega$ .

Furthermore, we construct a model in which there is a countable sequence of countable sets of reals without a choice function, yet for every countable Borel equivalence relation  $E$ , countable choice for  $E$ -classes holds. This separation in turn gives rise to an interesting new Borel equivalence relation. This equivalence relation is pinned, below  $=^+$ , and strictly above  $(E_\infty)^\omega$ .

[1] JINDRICH ZAPLETAL, *Forcing Idealized*, **Cambridge Tracts in Mathematics 174**, Cambridge University Press, Cambridge, 2008.

[2] V. KANOVEI, M. SABOK, J. ZAPLETAL, *Canonical Ramsey theory on Polish Spaces*, **Cambridge Tracts in Mathematics 202**, Cambridge University Press, Cambridge (2013).