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Projections between Ramsey quasi-orders

A Ramsey quasi-order is a Polish space equipped with a definable quasi-order in which analytic subsets satisfy a natural Ramsey property with respect to the ordering. There are many natural such orders, for example: infinite subsets of natural numbers under containment, block sequences from FIN_k under reduction, strong subtrees of the complete binary tree under containment and sequences of variable words under substitution and concatenation. We introduce a framework for comparing these Ramsey quasi-orders and show that under natural assumptions, monotone maps between these quasi-orders transfer their Ramsey properties if and only if they map generic filters to generic filters. In this case we say that there is a "weak projection" between the Ramsey quasi-orders. Applying this definition to a large collection of Ramsey quasi-orders from the literature, we are able to give a fairly complete picture of which of them do and do not weakly project to each other. This is joint work with Clement Yung.