1125-03-127 **Henry P. Towsner*** (`htowsner@math.upenn.edu`). *Hypergraph Regularity, Ultraproducts, and a Game Semantics.*

One approach to Szemeredi's graph regularity lemma, its generalization to hypergraphs, and its applications is to pass to infinitary limiting object - an ultraproduct - take advantage of measure-theoretic tools like the conditional expectation. Indeed, in a formal sense, graph regularity is equivalent to the existence of a particular case of the conditional expectation.

We describe how these infinitary arguments can be systematically reinterpreted as constructive, explicit, finitary arguments. More generally, we describe an alternative semantics for first-order logic in which statements about limiting objects like ultraproducts are reinterpreted as finite statements about winning strategies in a certain two-player game. (No prior knowledge about graph regularity or ultraproducts will be assumed.) (Received September 18, 2016)