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Nilpotent endomorphisms of quiver representations and reverse plane partitions

Let Q be a quiver, and let M be a representation of Q . What can we say about the generic behaviour of a nilpotent endomorphism of M ? It turns out that this question is already interesting for type A_n Dynkin quivers, for which it connects up to reverse plane partitions, a classical notion in tableau combinatorics. For λ a partition, a reverse plane partition of shape λ is a filling of the boxes of λ by non-negative integers which is weakly increasing along both rows and columns. In 1971, Richard Stanley gave a beautiful formula for the generating function counting reverse plane partitions of fixed shape λ by weight (the sum of the entries). In 1976, Hillman and Grassl gave a bijective proof of Stanley's formula, introducing what is now called the Hillman-Grassl correspondence. We show that the Hillman-Grassl correspondence (and generalizations of it) can be understood in terms of the representation-theoretic question we started with. This is joint work with Al Garver and Becky Patrias.