

THE COMBINATORICS OF PREFERENCE PROFILES

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A social choice rule summarizes and compresses the opinions of many voters into the aggregate opinion of society. In the standard mathematical framework, opinions are just rankings (linear orders) of the alternatives, and a social choice rule maps a subset S of linear orders into a single linear order.

If we allow the set S to run over all possible subsets of linear orders, then we immediately get into trouble. Famous theorems by Kenneth Arrow and by Allan Gibbard and Mark Satterthwaite state that in the general case, social choice rules must show certain undesirable properties; these rules are susceptible to tactical voting and their outcome is easily manipulated. For these reasons the social choice community studies so-called "domain restrictions" for subsets of linear orders: these are certain combinatorially restricted types of subsets that manage to avoid the pitfalls of Arrow and Gibbard and Satterthwaite. Famous examples of domain restrictions are single-peaked and single-crossing sets of linear orders.

The talk surveys the combinatorics of some popular domain restrictions that show up in a variety of models in the social sciences and economics. We discuss characterizations by finitely many forbidden substructures, polynomial time recognition algorithms, and some related results.