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### An Application of Oriented Matroids in Behavioral Sciences

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#### Abstract for the Combinatorics Seminar 2017 November 7

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Additive conjoint measurement (ACM) is a theory that allows one to deal with non-quantitative objects in quantitative terms. For instance, consider a problem in data analysis: we hypothesize that a quantity  $f$  depends on two independent variables. The variables take values in sets  $A$  and  $B$ , respectively, which are preordered but may not be numerical. For instance,  $f$  might be the price a customer is willing to pay for a shirt,  $A$  is the set of possible colors,  $B$  is the set of possible styles, and each of  $A$  and  $B$  is preordered by the customer's preference. ACM gives a framework to test our hypothesis based on incomplete information about  $f$  and to make quantitative sense of  $A$  and  $B$ . I'll discuss recent work with John Dunn that formulates ACM in terms of oriented matroids.

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