

Additive Context-Dependent Preferences

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Simple Experiment

	C_2	D_2
C_1	\$3 , \$3	\$1 , \$5
D_1	\$5 , \$1	\$2 , \$2

Simple Experiment

	C_2	D_2
C_1	$U(\$3), U(\$3)$	$U(\$1), U(\$5)$
D_1	$U(\$5), U(\$1)$	$U(\$2), U(\$2)$

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How to measure utility of outcomes based on behavior in the game?

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Primitive: $\succsim_p$

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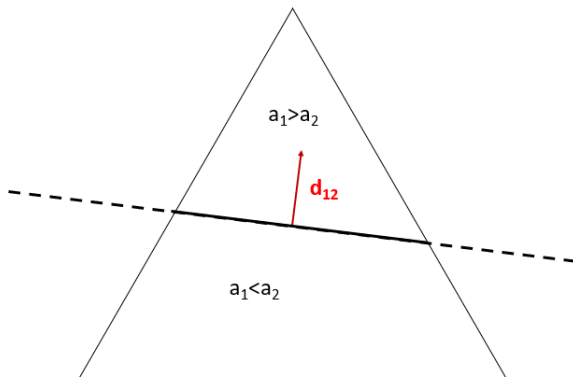
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Represent (s_i, s_j) -comparison with utility **differences** $d_{ij} \in \mathbb{R}^{|S_{-i}|}$.

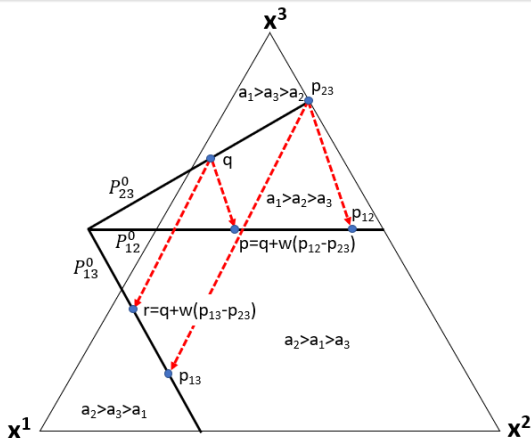
Crucial structural condition: $d_{ij} + d_{jk} = d_{ik}, \forall i, j, k$

Pairwise Comparisons



Linear preference intensity:

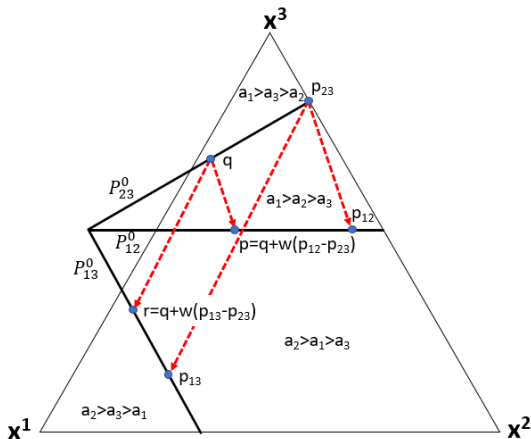
$$p' \equiv q' \pmod{p - q} \Rightarrow d_{ij} \cdot (p' - q') = \lambda d_{ij} \cdot (p - q)$$



Triple Additivity: Take indifference $p_{12}, p'_{12}, p_{13}, p'_{13}, p_{23}$ with $p'_{12} \equiv p'_{13} \pmod{p_{12} - p_{13}}$. Then

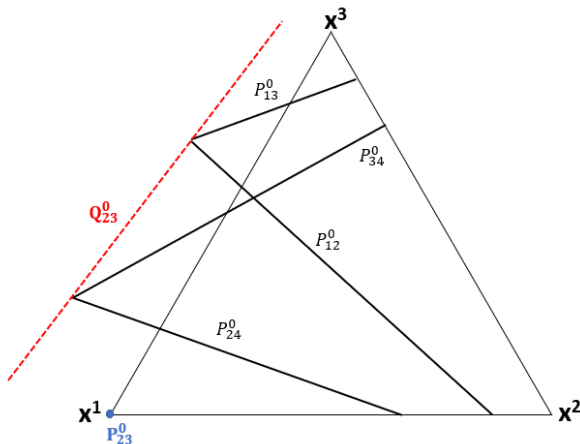
$$(q \equiv p'_{12} \pmod{p_{23} - p_{12}}) \wedge (q \equiv p'_{13} \pmod{p_{23} - p_{13}}) \Rightarrow s_2 \sim_q s_3.$$

Triples



Pairwise conditions + transitivity + triple additivity characterizes triple representation.

n -Tuples (work in progress)



Congruence wrt multi-dimensional subspaces

Extra conditions for degenerate cases (reverse Menelaus equation)