## Nucleolus

For every x ∈ A, denote by θ(x) an ordered vector that orders the components of e(S, x)
(S ⊆ N, S ≠ N, ∅) in descending order.

$$\theta(x) = (e(S_1, x), e(S_2, x), \dots, e(S_{2^n - 2}))$$
$$e(S_1, x) \ge e(S_2, x) \ge \dots \ge e(S_{2^n - 2}))$$

- For any two imputations  $x, y \in A$ , x is more **acceptable** than  $y \Leftrightarrow \theta(y)$  is *lexicographically greater* than  $\theta(x)$  (denoted  $\theta(y) >_L \theta(x)$ )  $\Leftrightarrow$  there exists  $k \in \{1, ..., 2^n 2\}$  such that
  - $\begin{aligned} \theta_i(x) &= \theta_i(y) \ \forall i = 1, ..., k 1 \\ \theta_k(x) &< \theta_k(y) \end{aligned}$
- A set of imputations L is the **nucleolus**  $L = \{x \in A | \text{there is no } y \text{ such that } y \text{ is more acceptable than } x \}$
- The nucleolus always exists and contains exactly one element .
- If the core is nonempty, then the nucleolus is contained in the core.