## Detailed description of compositional data analysis

To describe the statistical analysis in more detail, lets denote the movement behavior composition as . The corresponding pivot coordinates are constructed as The following regression model is considered

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where is a vector of unknown regression coefficients and is the error of model. Actually, different regression models are considered (here and , respectively) with different sets of pivot coordinates – each time, different part is put at the first position in a composition so that each first pivot coordinate represents the relative dominance of a different compositional part. Let denotes the (robust) mean composition expressed in pivot coordinates and let asterisk mark the connection with the mean composition where some amount of time was reallocated between the two parts. Then stands for the reallocated mean composition expressed in pivot coordinates. The difference between the predicted adiposity markers (on the log scale) for the mean composition and the predicted adiposity markers (on the log scale) for the reallocated mean composition is computed as , where and is a vector of estimated regression coefficients (calculated using the robust MM-regression). The corresponding approximate confidence interval is calculated as , where is a -quantile of *t*-distribution with degrees of freedom, is a number of observations, is a number of regression parameters (here ) and is estimated covariance matrix of the regression coefficients; the quantiles hold only approximately in the robust case. Then, the estimated difference in adiposity associated with the reallocation of time between movement behaviors is considered as significant if the confidence interval does not include 0. Subsequently, the relative difference between the predicted adiposity markers for the mean composition and the predicted adiposity markers for the reallocated mean composition is computed as . Similarly, for the confidence interval, the exponential function is applied to its lower and upper value. Then, the significance is implied if the confidence interval does not include 1.