

An individual-based model for the study of the obesity epidemic in French adolescents

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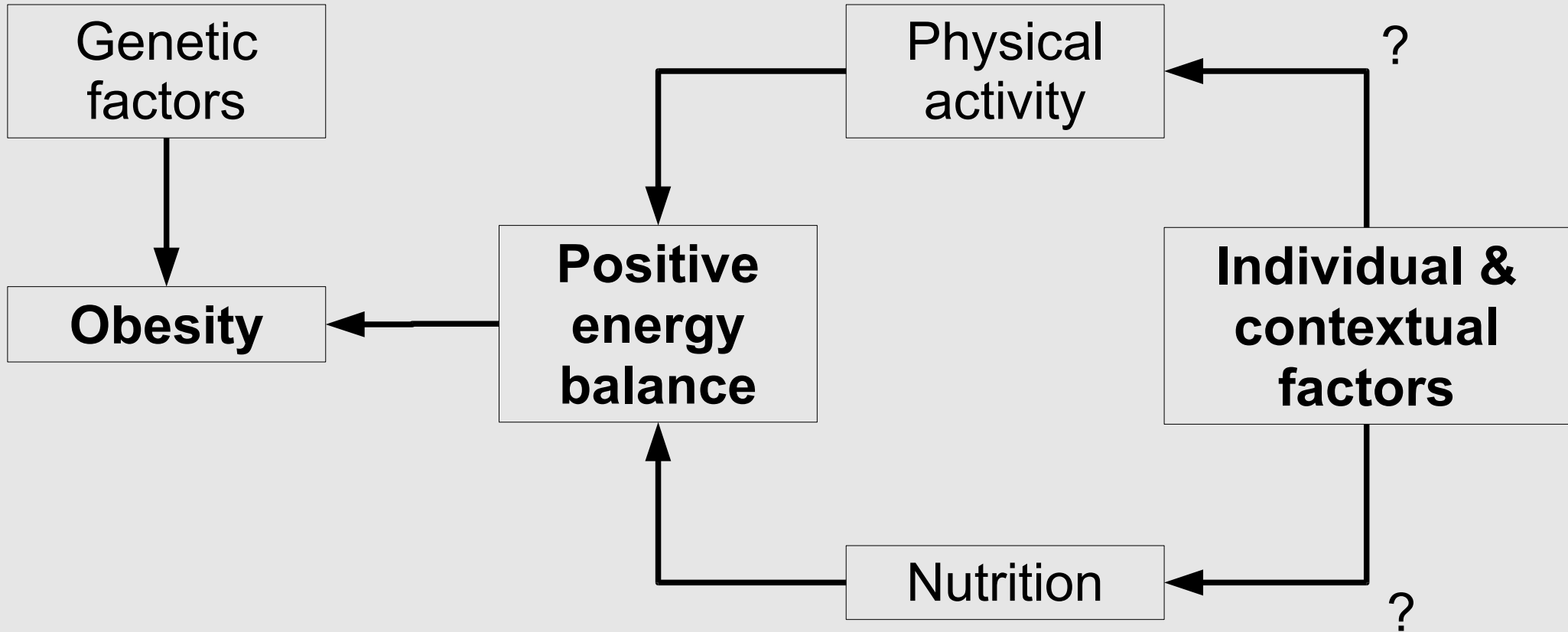
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Obesity: what's the matter ?

- dramatic increase during past three decades
 - strong socio-spatial disparities
 - risk factor for other diseases
 - in youth: short & long term heavy consequences
- => a major public health concern**

What are the potential causes?



Aim and design of the project

- to study contextual influences on PA behaviours
- to study PA behaviours' contribution to the obesity epidemic evolution
- obesity emerges from a complex system of interactions
- individual-based model

Individual data *(Simon et al. 2004 & 2008, Int J Obes)*

- survey data from intervention (4 years, 2002-2006)
- N ~ 950 individuals (~ 12 yrs in 2002), 8 schools
- health data (height & weight, fat mass...)
- socio-economic data (parents' job, education...)
- nutrition, PA, sedentary & travel behaviours
- psychological data (intention, self-efficacy)
- perceived environment (access to facilities)

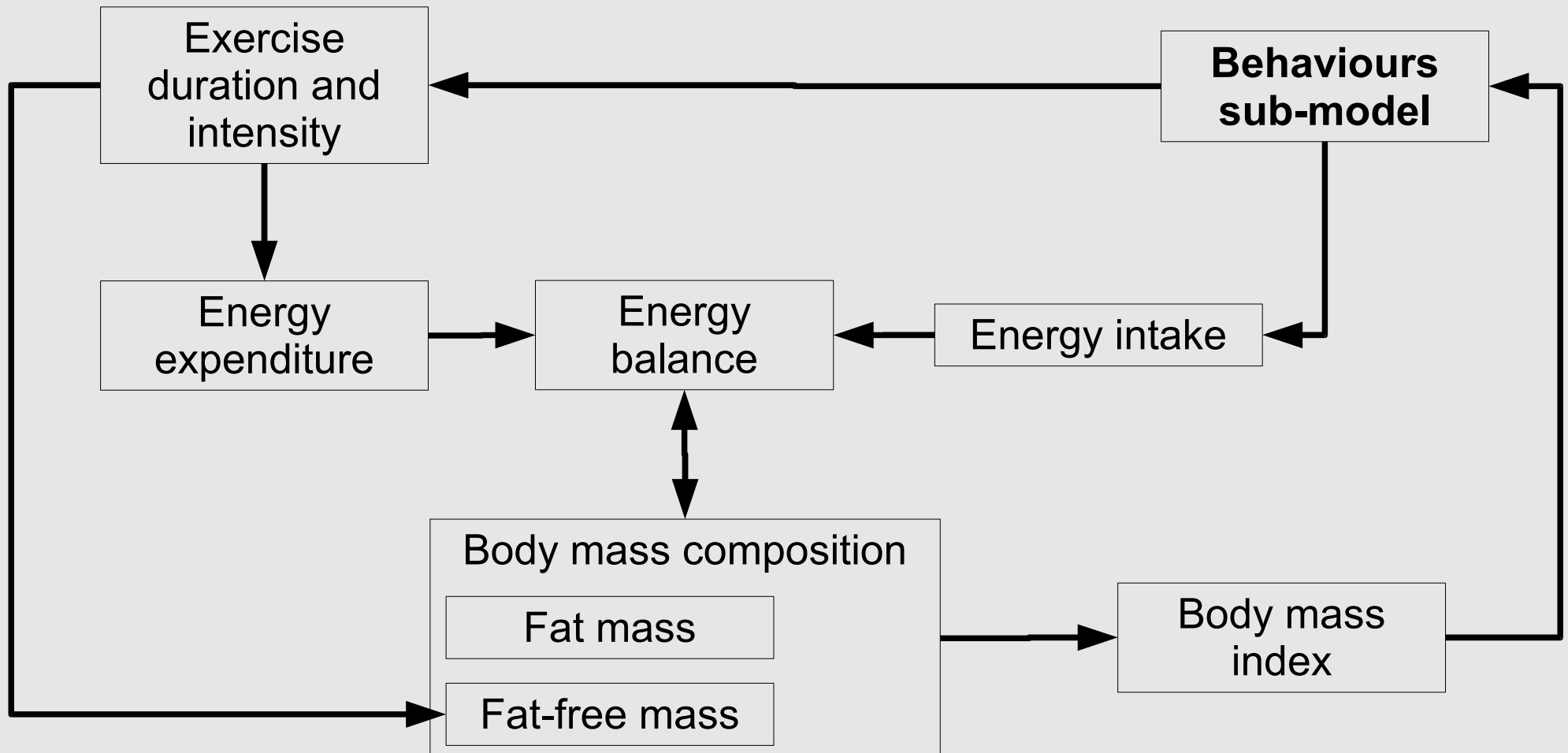
Contextual data

- population census
- land-use database
- sport facilities census
- road network database
- public transportation data

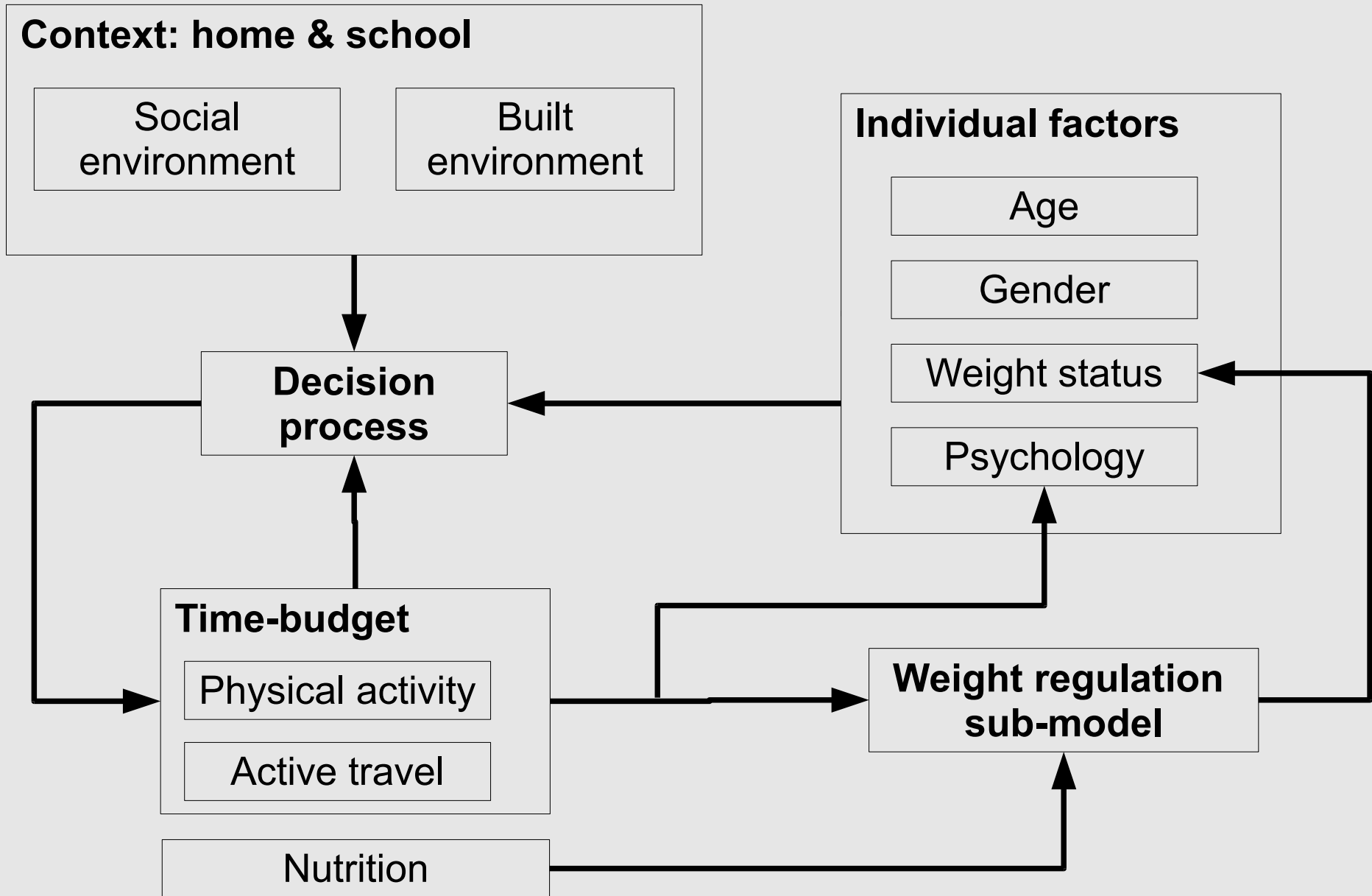
An individual-based model. Why?

- Simulation tool
- Dynamic approach
- Spatially explicit
- Heterogeneity of individuals
- Integrated approach: 2 sub-models

Conceptual model. Weight regulation sub-model



Conceptual model. Behaviours sub-model



Building decision rules

- statistical & spatial analysis → "if – then" rules
- empirically derived and literature data

Model implementation

- choice of the programming environment (Repast?
NetLogo?)

Model validation

- internal (sensitivity analysis), external (empirical data) 10

Exploring scenarios

- light environmental changes (e.g. more facilities, improved transport network...)
- heavy environmental changes (house movings...)
- behavioural changes (active transportation, increasing PA levels, nutrition...)
- intervention modelling

Thank you for your attention

