Reviewer’s report

Title: Social Interactions of Eating Behavior among High School Students: A Cellular Automata Approach

Version: 3 Date: 18 April 2012

Reviewer: Laurent Pezard

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1. The article presents a cellular automata model which simulates the social interactions regarding eating behavior in high-school students. It specifically studies the effect of purchasing power and social influence. It introduces an interesting methodology into a field where experimental testing is difficult. The introduction is clearly written and exposes the interest of this approach.

2. The description of the model lacks some major information to adhere to standards which ensure that simulations are easily reproducible. Moreover notations can be misleading (see below). Descriptions of the simulations and legends of tables and figures are not detailed enough to allow a direct understanding of the information and a clear assessment of the results.

- Major Compulsory Revisions

3. Description of the model:
   a. No numerical values are given for the parameters (alpha, beta, Gamma).
   b. Gamma parameters are not defined.
   c. Social influence denoted P and N in the results section do not appear in the model description.
   d. Purchase power is denoted P_s, then P (in transition rules and this can be confounded with positive social influence, later on) and then PP.
   e. In the transition rules, which counter is taken into account if both conditions are fulfilled?
   f. The size of the model (i.e. number of cells), the time scale of one simulation step are not explicitly stated (although they can be inferred from the y and x labels of figure 2).
e. What are the boundary conditions?

4. Results:

a. (Change in the increase of purchasing power...) The difference between the three purchasing power (PP) scenarios is not obvious on the snapshots. Some quantification (such as spatial correlation) of a set of simulations could demonstrate the effect of PP.

b. (Change in the increase of healthy impact) Does the results corresponds to only one simulation run or an average over several different initial conditions? The second solution with standard deviation is certainly preferable.

c. (Phase diagram) Same question: is this the result of only one simulation run? What is PM in the figure title?

- Minor Essential Revisions

5. Notations:

Parameter alpha, beta and Gamma are numbered (1, 2, 3, 4). For alpha and beta, it corresponds to BH, BU, PH, PU. This could be explicit in the notation.

6. Table 2: (Isn't it a figure?)

Since N=0.01 is constant over all the simulations, its appearance for each snapshot is confusing.

Only clearly different snapshots are of interest.

- Discretionary Revisions

7. Moore neighborhood is not usually described as a boundary condition. A boundary condition describes the behavior of the cells at the limit of the model.

8. Figure 1: The "Purchase Healthy" in the red circle should be "Purchase Unhealthy"

9. Is the MatLab code available?

10. What are the effects of initial conditions?

**Level of interest:** An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests