Agent modeling

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#This assignment follows FAIR (findable, accessible, interoperable, reusable) guiding principles.
#This assignment (include this file) has been uploaded on GitHub with a readme part. Link: https://github.com/Seoyangsam/agent-modeling#agent-modeling

- Status quo: The FAIRness level of the data in the use case is quite high since it's already on GitHub, other users can find it on GitHub and use all the data by their own. I didn't put any license since it's completely open for anyone for any use.
- Objective in FAIRness: The best way to improve in data FAIRness for the considered use case is to write more detailed readme part to make it more interoperable and reusable.
- Roadblocks: The readme part is not detailed enough, other people may get confused somehow that how should they reuse this usecase. Thus, a more detailed readme part is needed.
- Recommended actions (list both technical and non-technical actions): What should be done to the data in the use case to reach the desirable objective in FAIRness is to check other people's readme part on GitHub to see how can I make my own part as well. What was missing, and how should I add it into mine.
- Success criteria: How can it be ensured/checked that the recommended actions are successful? I would like to ask other users to give feedback if the usecase's FAIRness has been improved or not.

1.

Experiment 1

People	Level of Awareness	Avg. Awareness	Nr. of centers
20	unaware 20	0.1	5

Input parameter: people

Ticks: 1000

Centers: 25

non-usage-limit: 150

40	unaware 40	0.125	7
80	activist 41, well informed 10, aware 12, unaware 17	10.338	933
160	activist 160	15	1406
300	activist 300	15	1406

Experiment 2

Input parameter: centers

Ticks: 1000

People: 80

non-usage-limit: 150

Centers	Level of Awareness	Avg. Awareness	Nr. of centers
5	aware 1, unaware 79	0.063	5
10	activist 80	15	1406
25	activist 41, well informed 10, aware 12, unaware 17	10.338	933
50	activist 80	15	1406
100	activist 100	15	1406

Experiment 3

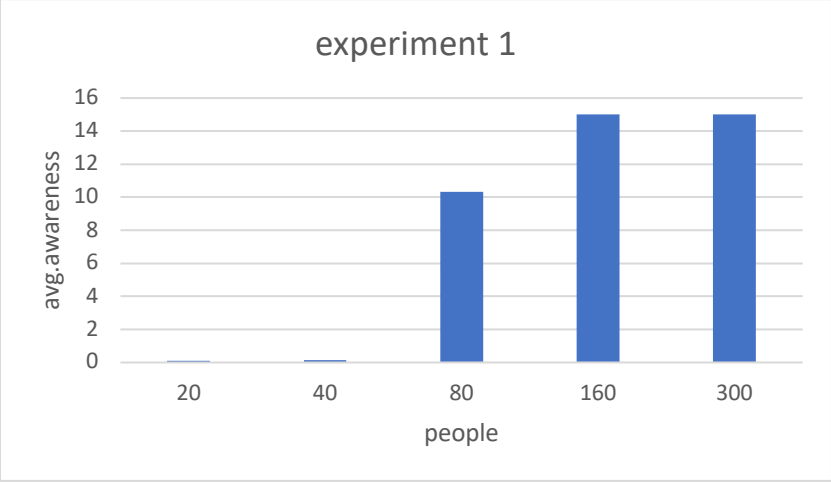
Input parameter: non-usage-limit

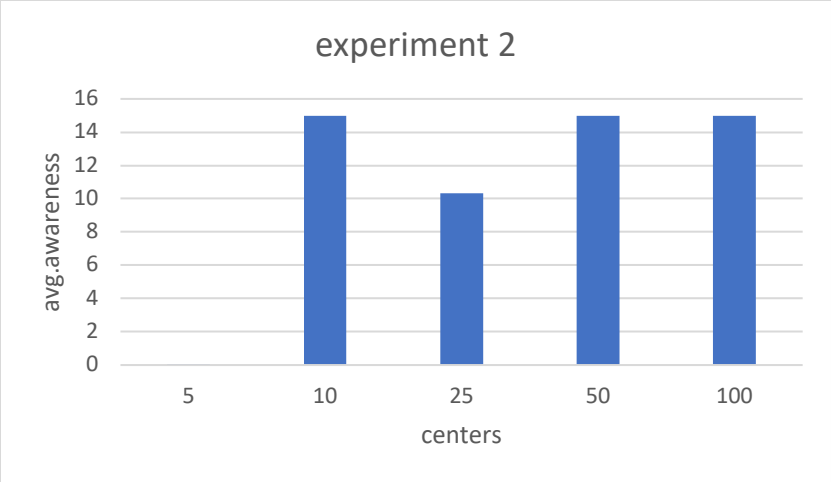
Ticks: 1000

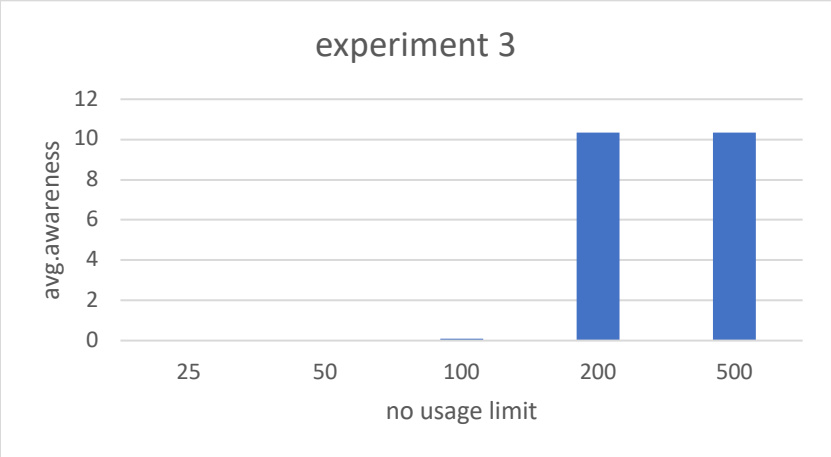
People: 80

Centers: 25

non-usage-limit	Level of Awareness	Avg. Awareness	Nr. of centers
25	unaware 80	0	0
50	unaware 80	0	0
100	aware 1, unaware 79	0.088	19
200	activist 41, well informed 10, aware 12, unaware 17	10.338	933
500	activist 41, well informed 10, aware 12, unaware 17	10.338	933







b. when increase the number of ticks is, the level of awareness (as well as average awareness and centers) was also increased.
c. when increase the “people”, the level of awareness (as well as average awareness and centers) was also increased.
d. when increase the “centers” and “non-usage-limit”, the level of awareness (as well as average awareness and centers) was also increased.
g. according to above tables and graphs, I think “centers” is most sensitive. And “people” seems essential to turn all people into activists or unawares. While “non-usage-limit” does not seem has much influence on the outcome of the model. For initial settings, when the parameters are extreme, it use less ticks to make the model enter a steady state.

2.

a. (here we changed ticks from 100 to 500) the threshold of NON-USAGE-LIMIT is 40; no, it doesn’t help to raise the initial number of people or centers, when the non-usage-limit decrease, the number of centers also decrease. (we can see it from experiment 3)

	Level of Awareness	Avg. Awareness	Nr. of centers
when place 20 centers	Aware 1; unaware 199	0.07	10
when place 5 centers	Activist 200	15	1402

Yes, I think it's realistic. When the centers are together, the influence is much greater than when they all spread out.

b. Assumptions:
(1) In this model, each person has some amount of "awareness", a person may be "unaware" (0 - 5 points), "aware" (5 - 10 points), "well-informed" (10 - 15 points), or an "activist" (more than 15 points).

(2) In this model, there is no such thing as "negative awareness".

(3) To gain awareness, a person either runs into a center, where they gain five awareness points; or is influenced by a person who is well-informed or an activist, where they gain one awareness point.

(4) When a person becomes an activist (15 awareness points), a new center is formed.

(5) If no one comes into contact with a center for a specified amount of time, the center disappears from the world.

c. In my views, the second assumption is not realistic, if some faction is spreading information that is in direct conflict to another faction, and people may come into contact with information and advertising promoting either position. Thus in real word, negative awareness do exist.

And other 4 assumptions I think they are all realistic.

3. a. Prevalence of laymen beliefs about meat, dairy, or plant proteins.

b. Aim:

The object of the model is to simulate the prevalence of laymen beliefs about meat, dairy, or plant proteins and evaluate the effect from propagators on one another, and on their environment in an information-rich context, for instance, party.

Assumptions:

The model determines a person's beliefs about meat, dairy, or plant proteins within a information-rich environment based upon a person's communication with propagators. In the model, propagators are people who hold very strong laymen beliefs such as "meat/dairy is essential to my health", and they will spread this belief to affect people surrounding them. What need to be pointed out is that we assume those propagators will not be influenced by others. So the influence is unidirectional. In general terms, "beliefs" involves a person's opinion about proteins which can defined as "laymen beliefs".

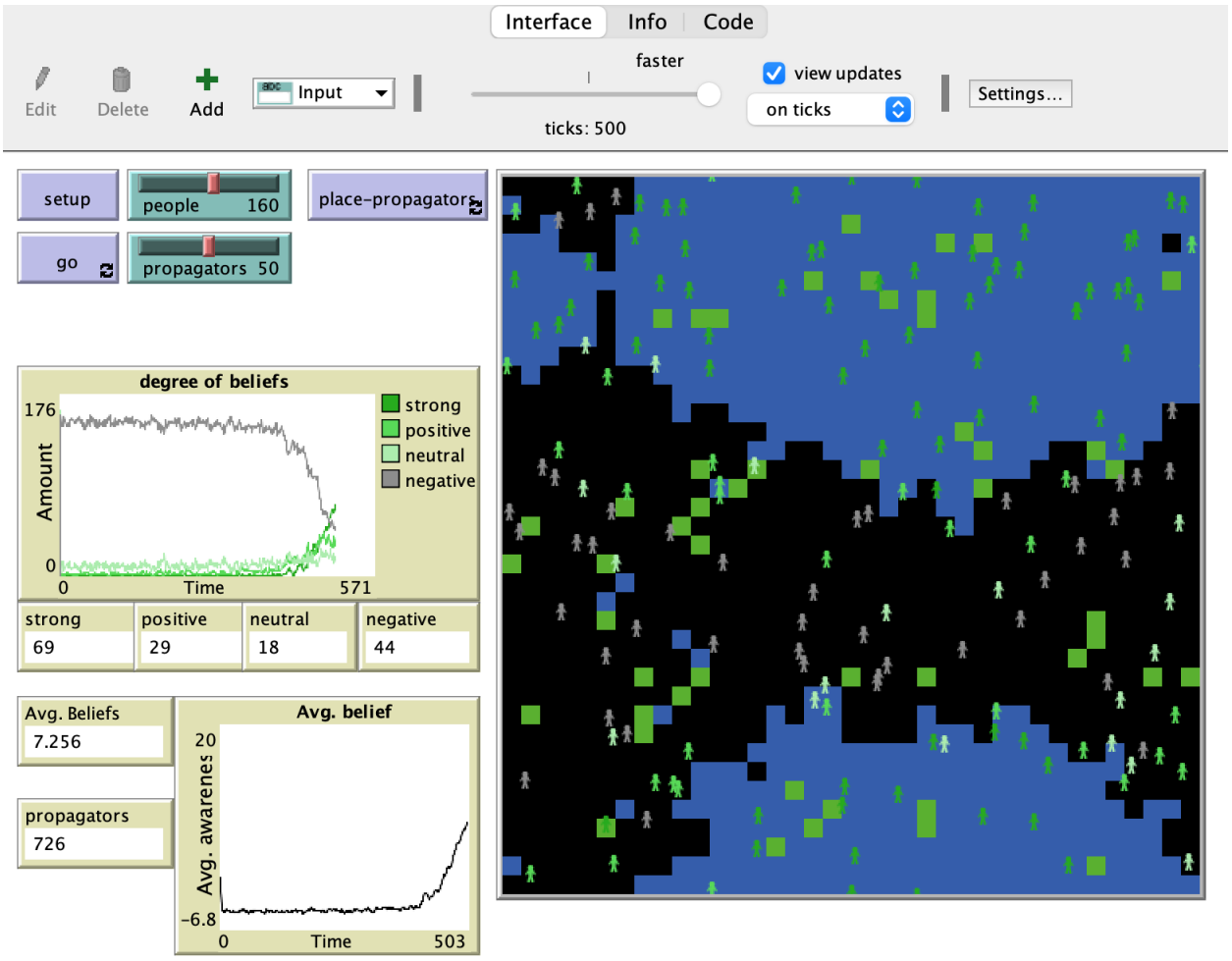
In this model, each person has some beliefs about meat, dairy, or plant proteins which is measured in "degree of beliefs". There is a discrete set of "levels" of beliefs that people may attain. A person may be "negative" (< 0 points), "neutral" (0 - 5 points), "positive" (5 - 15 points), or "strong" (more than 15 points). At the beginning, all people's belief point is 0.

People's beliefs will be affected by others. People influenced by a person who is "strong", they gain one belief point. In contrast, people influenced by a person who is "negative", they lose one belief point.

When a person becomes a "strong" (more than 15 belief points), a new propagator is born. The new propagators are colored blue, whereas the initial propagators are green.

Input: people, propagators

Output: degree of beliefs, average beliefs, number of propagators


Interface
Info
Code
Edit
Delete
Add
Input
faster
view updates
on ticks
ticks: 500
Settings...
setup
people 160
place-propagators
go
propagators 50
degree of beliefs
176
Amount
0
Time
0
571
strong
positive
neutral
negative
strong
69
positive
29
neutral
18
negative
44
Avg. Beliefs
7.256
propagators
726
Avg. belief
20
Avg. awarenes
-6.8
0
Time
503

d.

Experiment 1
Input parameter: people

Ticks: 500
propagators: 50

People	degree of beliefs	Avg. beliefs	Nr. of propagators
50	positive 1; neutral 2; negative 47	-4.36	52
100	strong 100	15	1406
150	strong 45; positive 35; netural 16; negative 54	5.0615	619
200	positive 1; neutral 8; negative 191	-4.62	52
300	strong 300	15	1406

Experiment 2
Input parameter: propagators
Ticks: 500
People: 100

propagators	degree of beliefs	Avg. beliefs	Nr. of propagators
5	neutral 1; negative 99	-4.94	5
25	negative 100	-4.98	25
50	strong 100	15	1406
75	strong 100	15	1406
100	strong 100	15	1406

After testing, I found that in this new model, the "people" is a sensitive parameter, and "propagators" is essential to turn all people into strong or negative.

While "propagators" is fixed, when the "people" increases, the average beliefs changed significantly, as well as the number of propagators.

While "people" is fixed, when the "propagators" increases, the average beliefs changed from negative number to positive number, however it became very stable since the number reaches 50. For the impact on the number of propagators, the variation is very huge, but it's also stable when the "propagators" is equal and greater than 50.

Also, we can see that there's a positive correlation between the average beliefs and the number of propagators. This meets the assumption, as we assume propagators can affect the surroundings.