Gentrification or Revitalization: a complexity science perspective

By Margo Crawford and Ryan Louie

gen·tri·fy

ˈjentrəˌfī/

verb

renovate and improve (especially a house or district) so that it conforms to middle-class taste.

re·vi·tal·ize

rēˈvīdlˌīz/

verb

imbue (something) with new life and vitality.

Related Work

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- "Creativity" = people who create knowledge based economies
- Increasing Creativity = Urban *Revitalization*
- Metric: Change in % Creative Space

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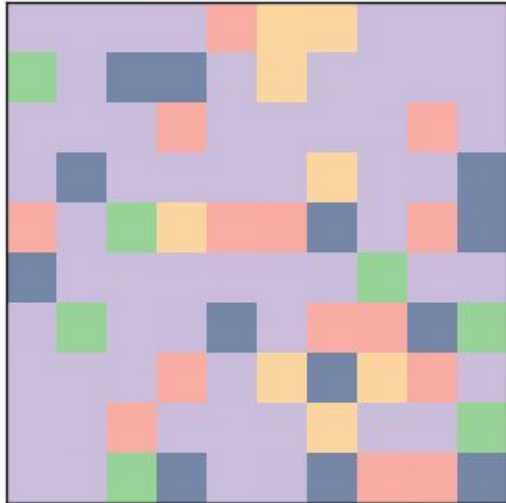- Metric: Change in % Creative Space

Our work diverges

- Only some components of their ABM is included
- Additional Metrics to study gentrification and negative effects
- Different urban policies as knobs to turn to affect our metric
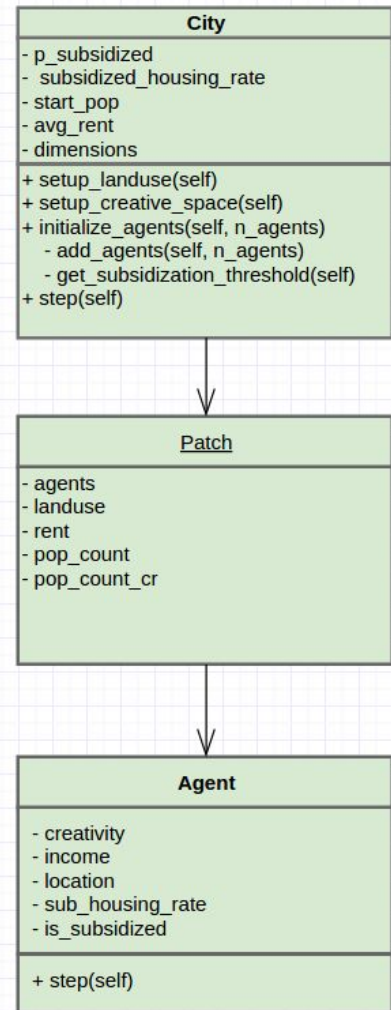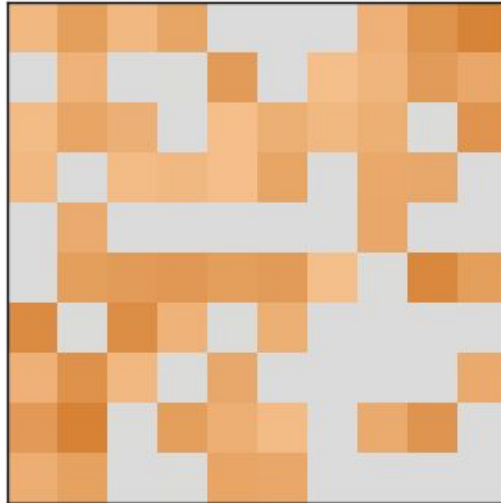
ABM - Agent and World attributes

World: 2D cells, land use, rent, residents

Agent: income, creativity, location, is subsidized

Landuse

Population Count

City

- p_subsidized
- subsidized_housing_rate
- start_pop
- avg_rent
- dimensions

+ setup_landuse(self)
+ setup_creative_space(self)
+ initialize_agents(self, n_agents)
  - add_agents(self, n_agents)
  - get_subsidization_threshold(self)
+ step(self)

Patch

- agents
- landuse
- rent
- pop_count
- pop_count_cr

Agent

- creativity
- income
- location
- sub_housing_rate
- is_subsidized

+ step(self)

Movement

Agents move when they are unhappy, which can be because their rent is too high or because they desire a space with more creative individuals.

When they move, they pick a random new residential cell to relocate to.

Subsidization Based On Agent Incomes

We subsidize some proportion p of the proportion p of agents in the model by decreasing their rent.

We take that proportion of the agents who have the lowest income and allow them to pay some fraction of the market rate in rent, which can also be defined by the user.

Income ($)
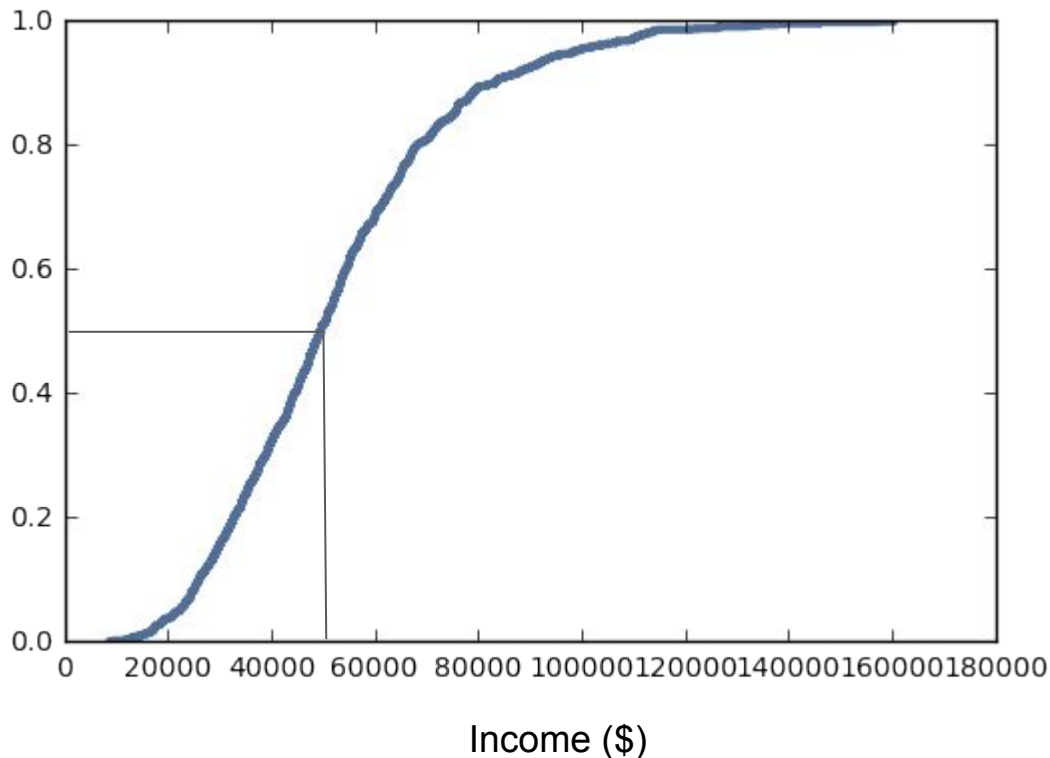
How does the amount paid by subsidized agents affect how many agents get displaced?

A main goal of our model is to curb displacement. In a city that is gentrified, some original residents can no longer afford rent, so they have to move.

Subsidization policies can keep more agents in their original locations and decrease the number of agents who move in each timestep.
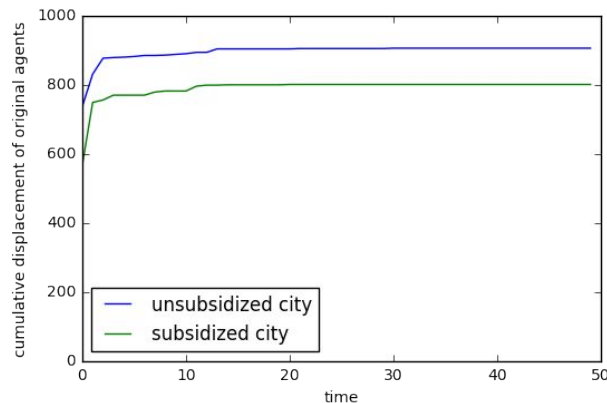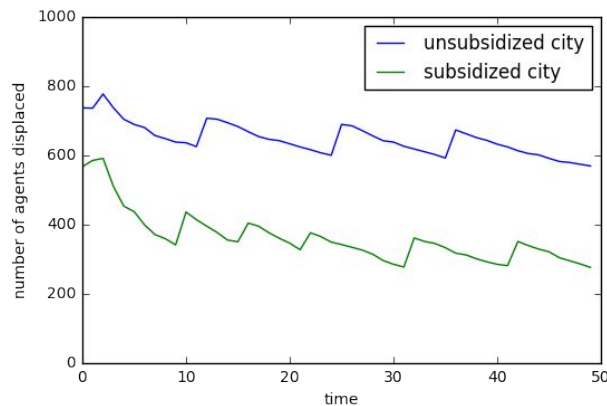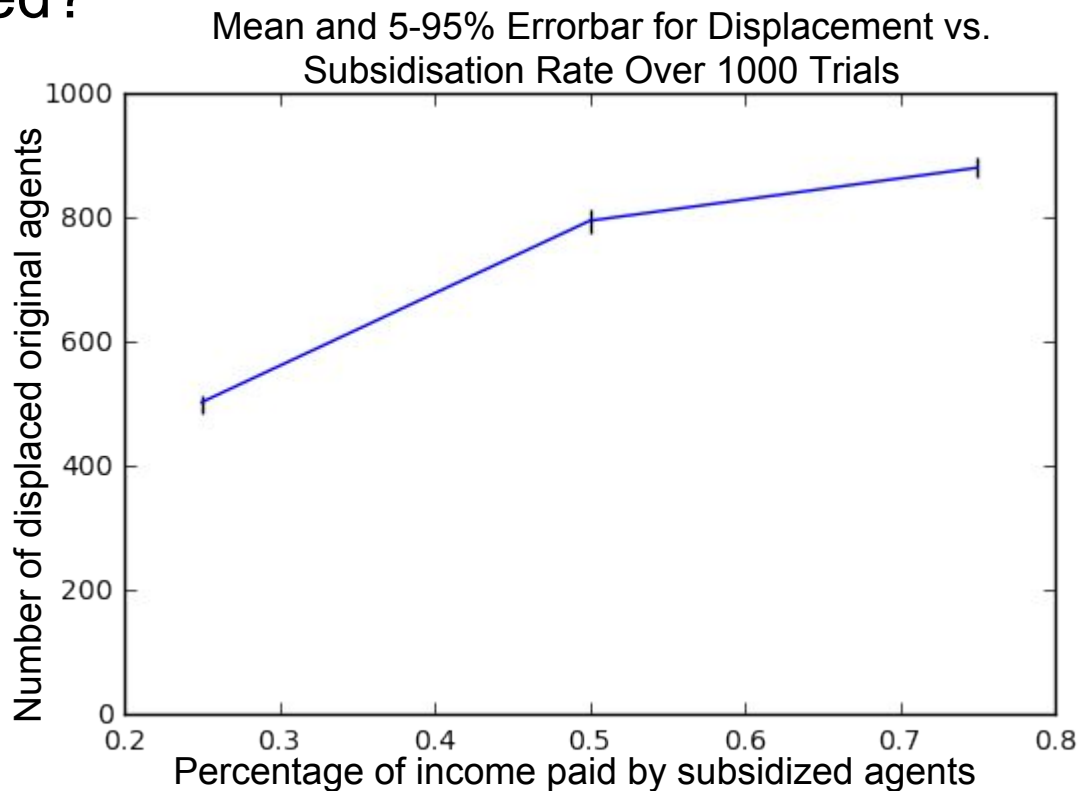
How does the amount paid by subsidized agents affect how many agents get displaced?

We ran trials with three different rent levels-- 25%, 50% or 75% of the rental rate was paid by the agents.

Higher subsidisation rates improve the agents' chances of staying put.

Mean and 5-95% Errorbar for Displacement vs. Subsidisation Rate Over 1000 Trials

Effect of Subsidization on Change in Creative Space

When patches become creative spaces (have at least K creative agents living there), areas become *revitalized.*

Altering the subsidization policy affects communities creativity.

K = 3
There is 5 creative agents. This is a creative space

Not a creative space
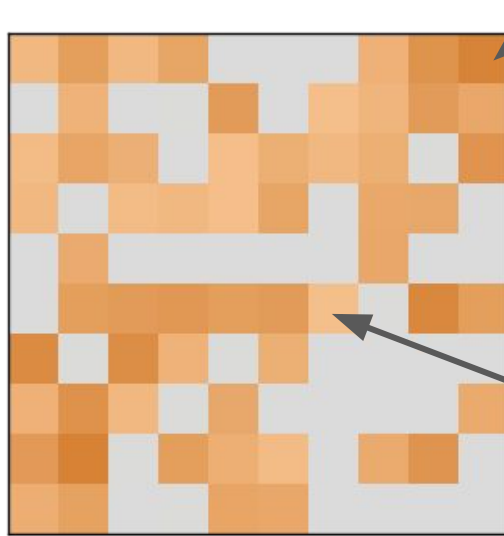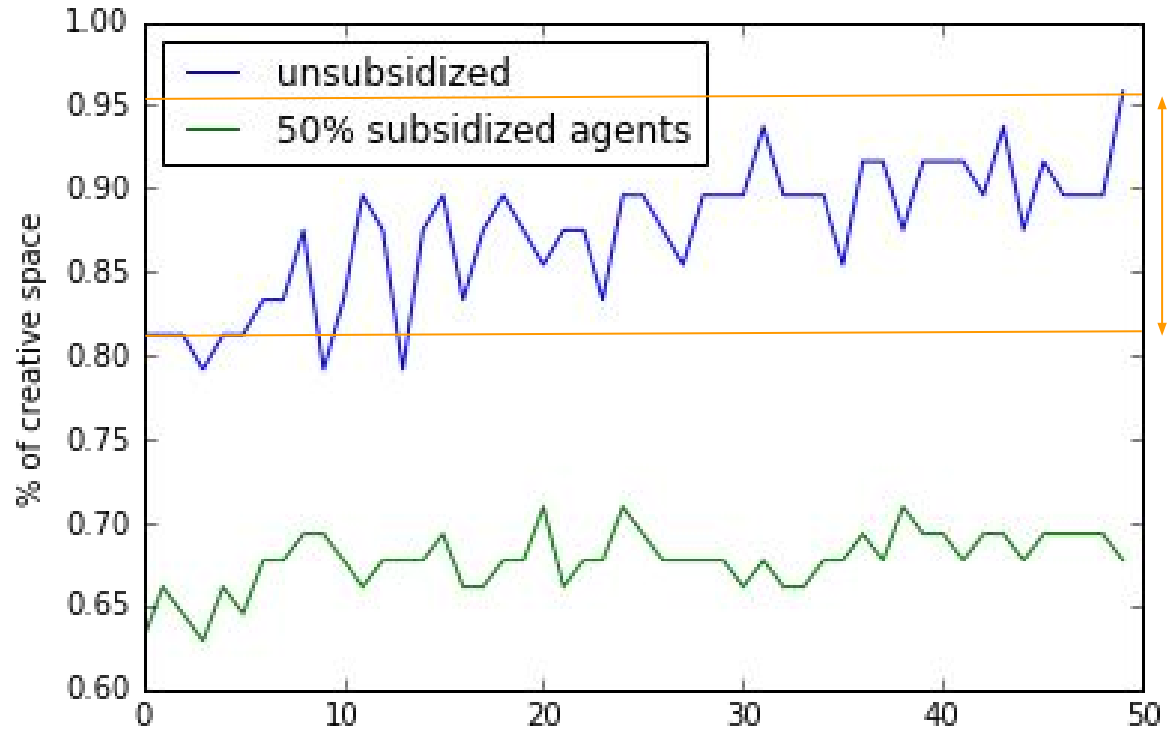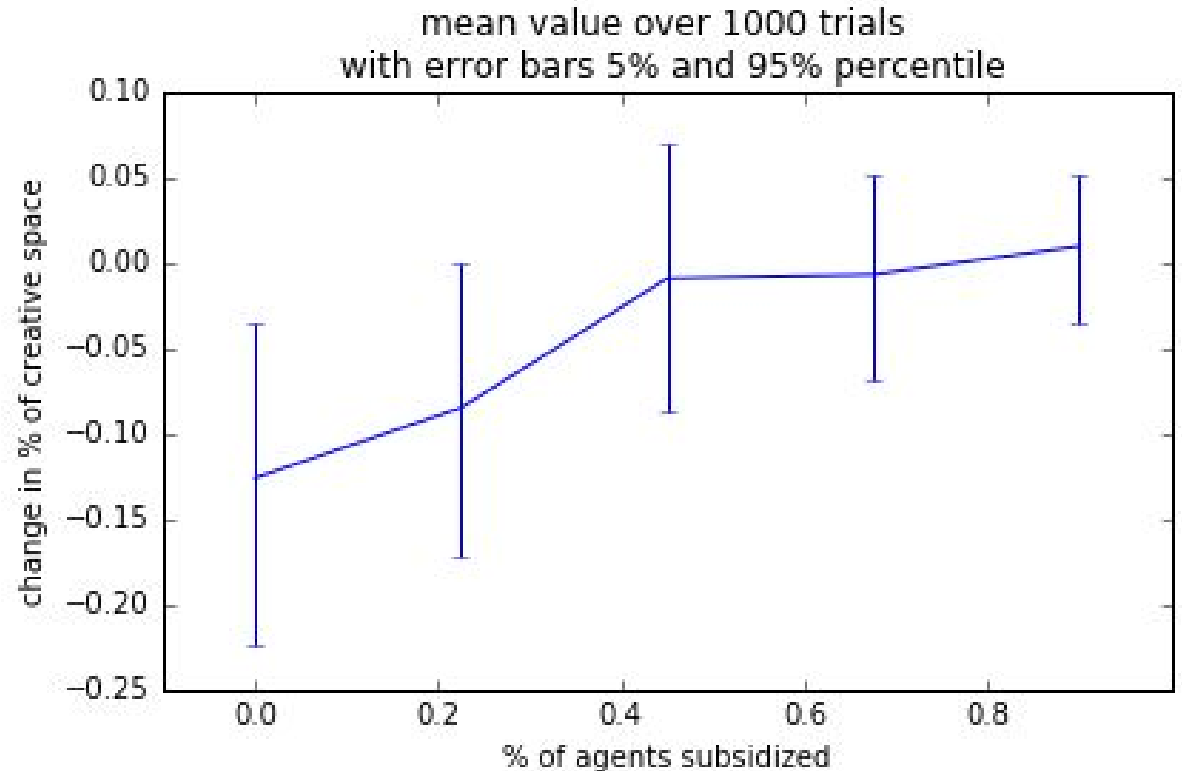
Count of Creative Agents

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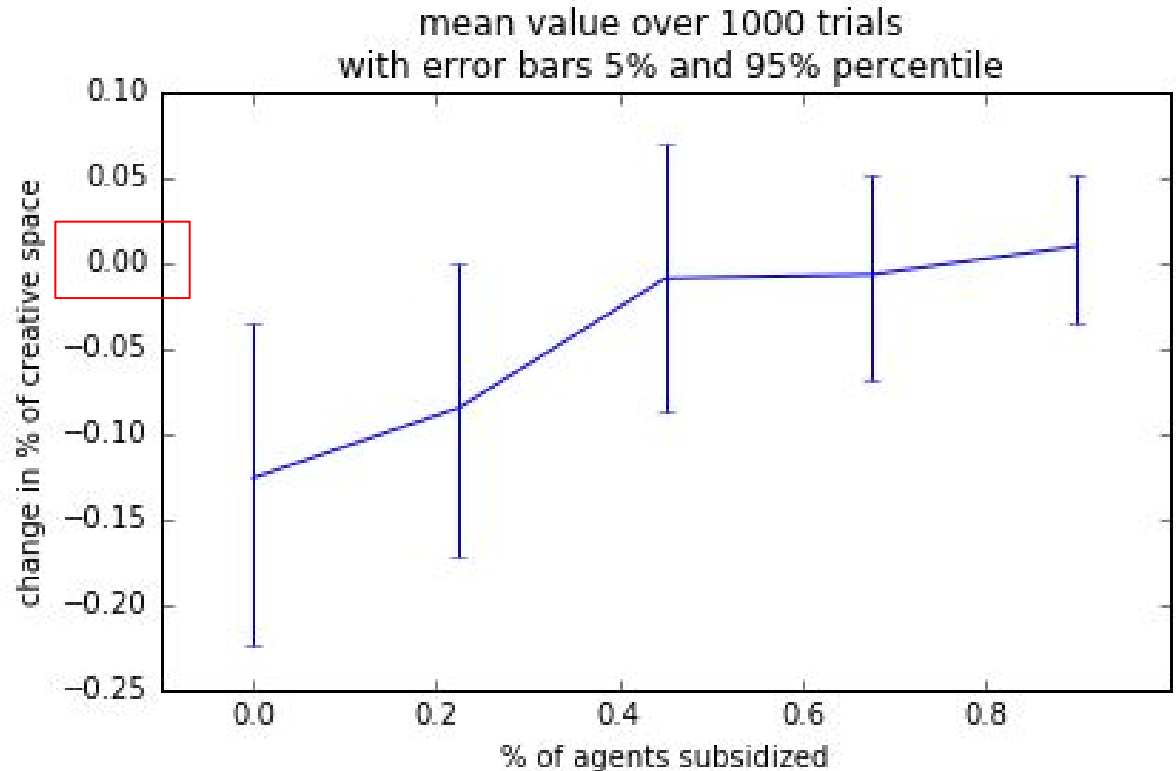# Effect of Subsidization on Change in Creative Space

Effect of Subsidization on Change in Creative Space

Concerns

Trend is the opposite of what we expect.

Creativity is never increasing, on average.

mean value over 1000 trials
with error bars 5% and 95% percentile

Next Steps

- Adding interactions between creative individuals
- Pressure from limited housing resources
- Inflow of agents with different income and creativity distribution
- Allow Development of unused patches into residential patches

Questions?

Discussion

1. If agents pay less for rent, less of them are displaced
2. If no agents are subsidized, creative space will decrease in a city (on average). More subsidization only makes creative space stay the same

So, should we just subsidize people more?

Hm… There doesn't seem to be a tradeoff.