Bystander Effect Agent Based Model

Megan Church
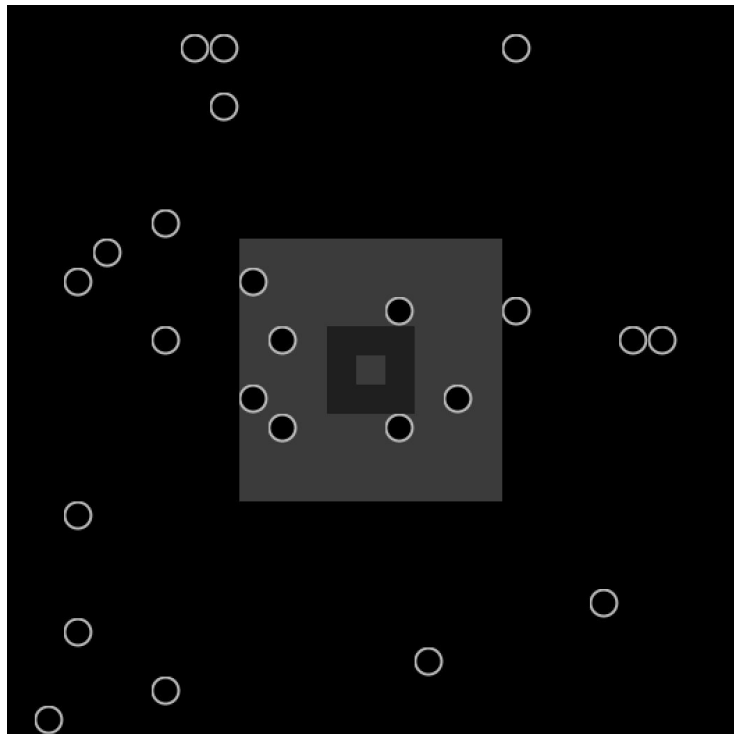
What is the Bystander Effect?

Diffusion of Responsibility $\longrightarrow$ More People = Less Help
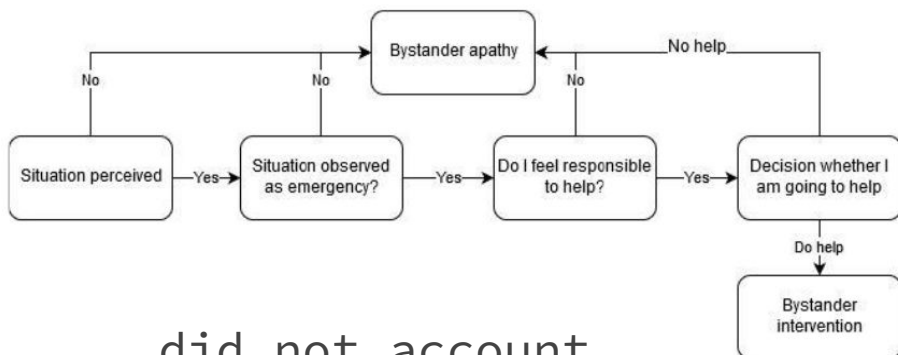
Agent Based Model Approach

- Spatial Distribution
- Individual Characteristics
- Individual Reactions
- Real Life Data

To Help or Not to Help: A Network Modelling Approach to the Bystander Effect


did not account for the amount of bystanders present

The Bystander-Effect: a Meta-Analytic Review on Bystander Intervention in Dangerous and Non-Dangerous Emergencies

Dangerous Emergencies → More Help

Social Relations and Presence of Others Predict Bystander Intervention: Evidence from Violent Incidents Captured on CCTV

Raw Data

processed

Event Data

Individual Data
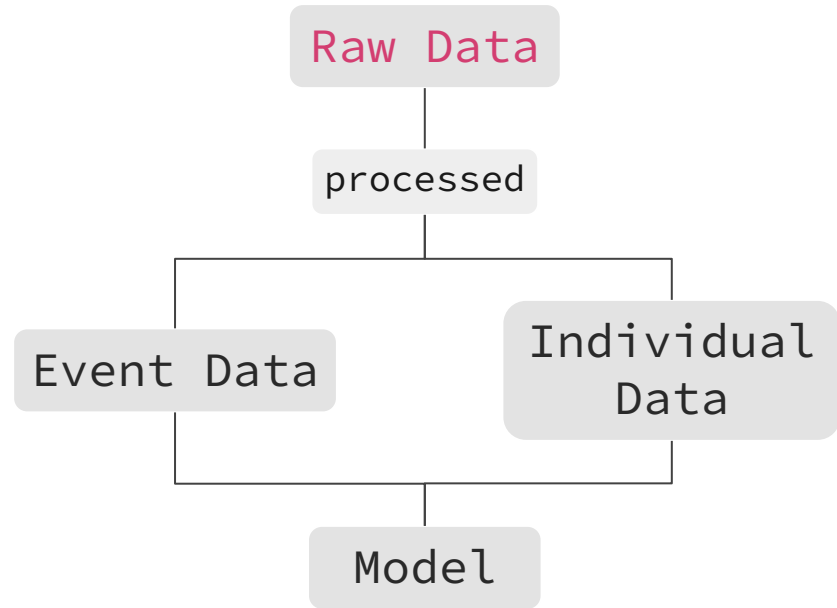
Model

Environment

Density

- high
- low

Location

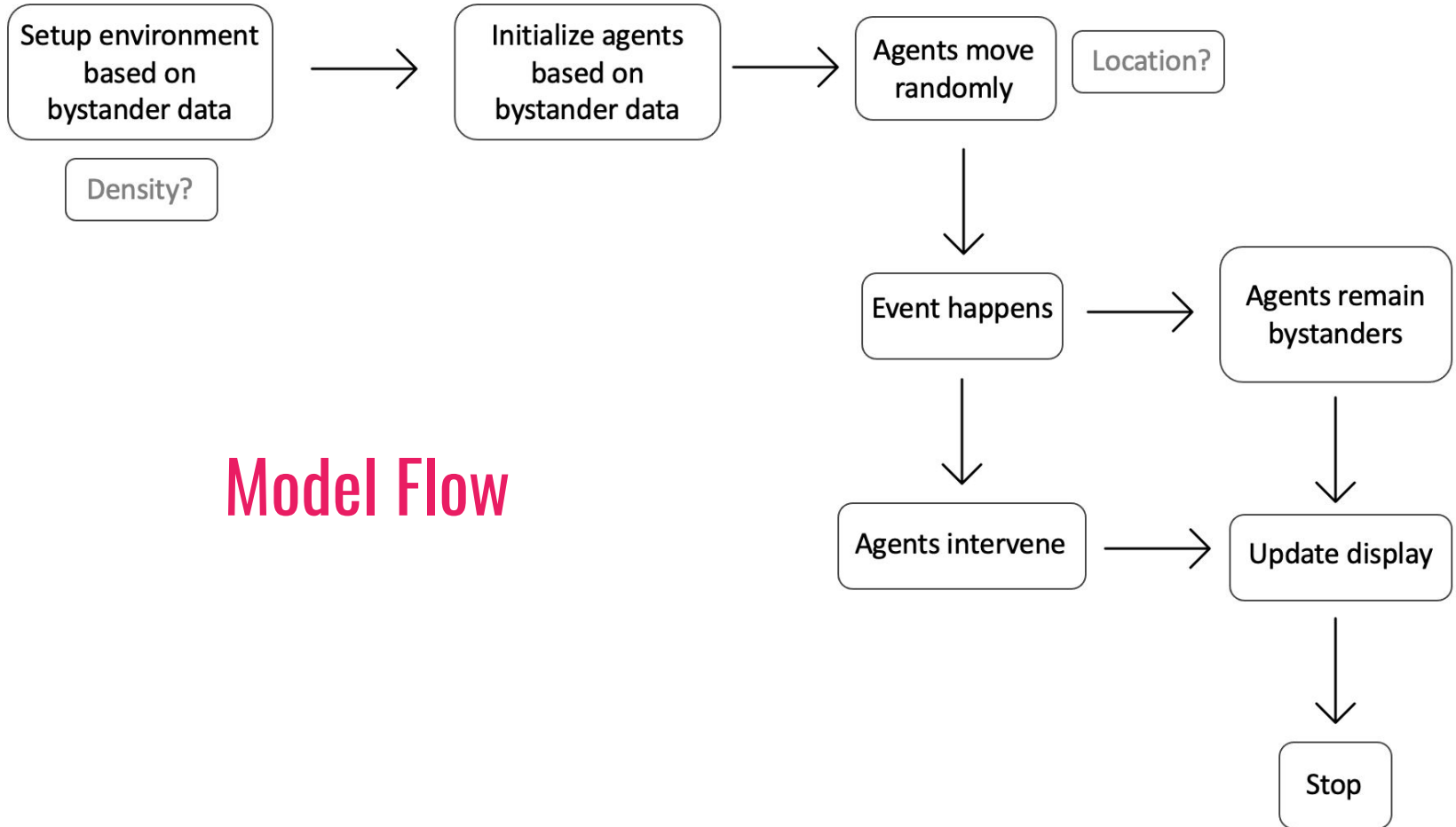- inside bar
- outside bar
- public street
- station
- shop/restaurant

Agents

Interveners

- gender/occupation
- proximity
- relationship
- action
  - escalatory
  - de-escalatory

Bystanders

- N/A

Setup environment based on bystander data → Initialize agents based on bystander data → Agents move randomly

Density?

Location?

Agents move randomly → Event happens

Event happens → Agents remain bystanders

Event happens → Agents intervene

Agents intervene → Update display

Agents remain bystanders → Update display

Update display → Stop

Model Flow

User Interactions

Display and Outputs

number-of-bystanders
13 ▽

setup   go ⟳

total interveners
12

percent interveners
92.31

snapshot

---------------Environment---------------

density
high

location
public street

day
friday

time
1:35 am

---------------Intervener Data---------------

▲ **percent bouncers**
8.33

■ **percent female**
33.33

● **percent male**
58.33

Action Type

count

0   action   3

○ □ △ **knows party**
11

de-escalatory   escalatory

both   none

close proximity to event
1

total interveners
12

percent interveners
92.31

More People = Less Help

As the Number of
Bystanders Increases
the Percent of
Interveners Decreases

Display and Outputs

number-of-bystanders
13

setup

go

total interveners
12

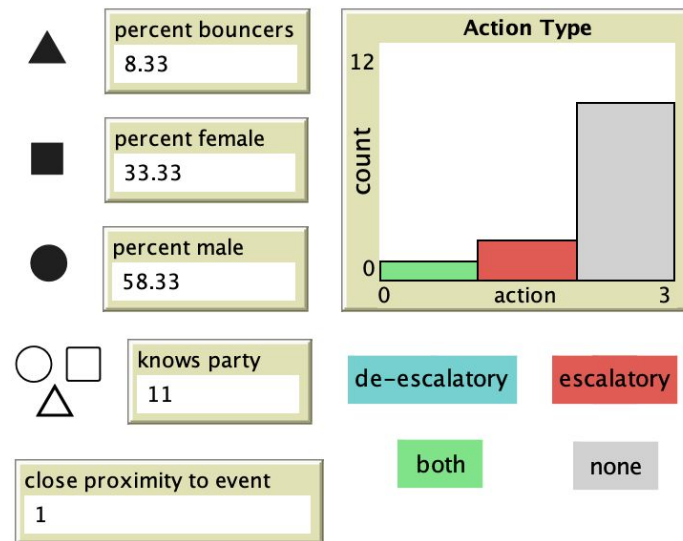percent interveners
92.31

snapshot

-----------------Environment----------------

density
high

location
public street

day
friday

time
1:35 am

---------------Intervener Data--------------

▲ percent bouncers
8.33

■ percent female
33.33

● percent male
58.33

Action Type

count

12

0
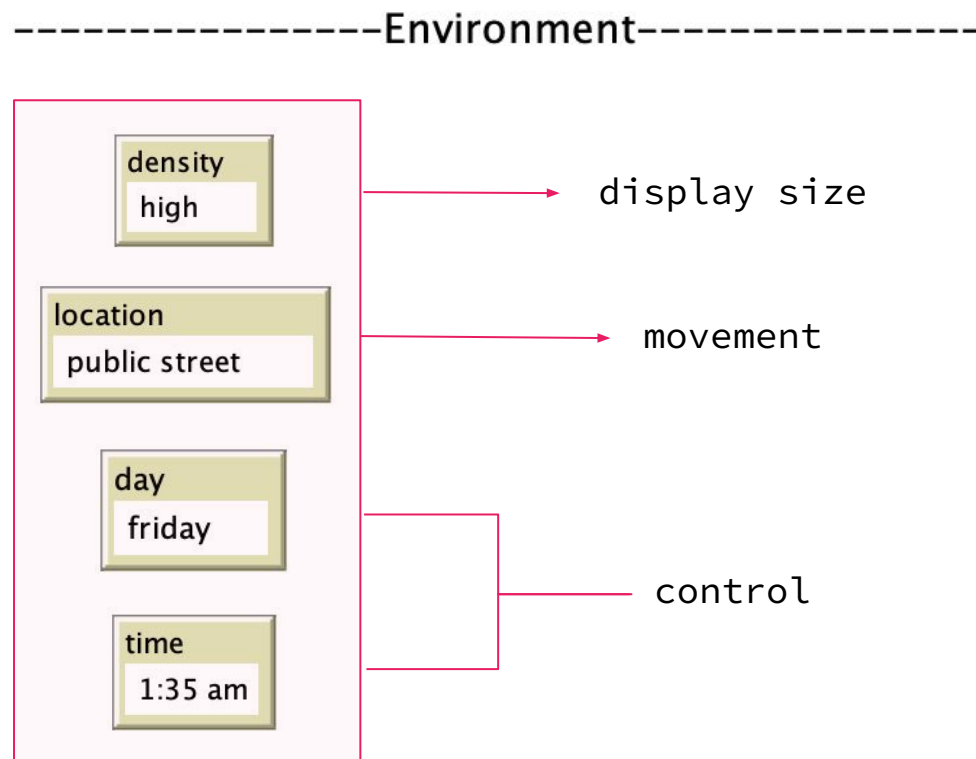
0   action   3

○ □
△

knows party
11

close proximity to event
1

de-escalatory

escalatory

both

----------------Environment----------------

density
high

→ display size

location
public street

→ movement

day
friday

control

time
1:35 am

Display and Outputs

number-of-bystanders
13

setup

go

total interveners
12

percent interveners
92.31

snapshot

----------------Environment----------------

density
high

location
public street

day
friday

time
1:35 am

----------------Intervener Data----------------

▲ percent bouncers
8.33

■ percent female
33.33

● percent male
58.33

Action Type

count / action

○ □ △ knows party
11

de-escalatory escalatory

close proximity to event
1

both none

----------------Intervener Data----------------

De-Escalatory

- open gestures
- non-forceful touching
- blocking
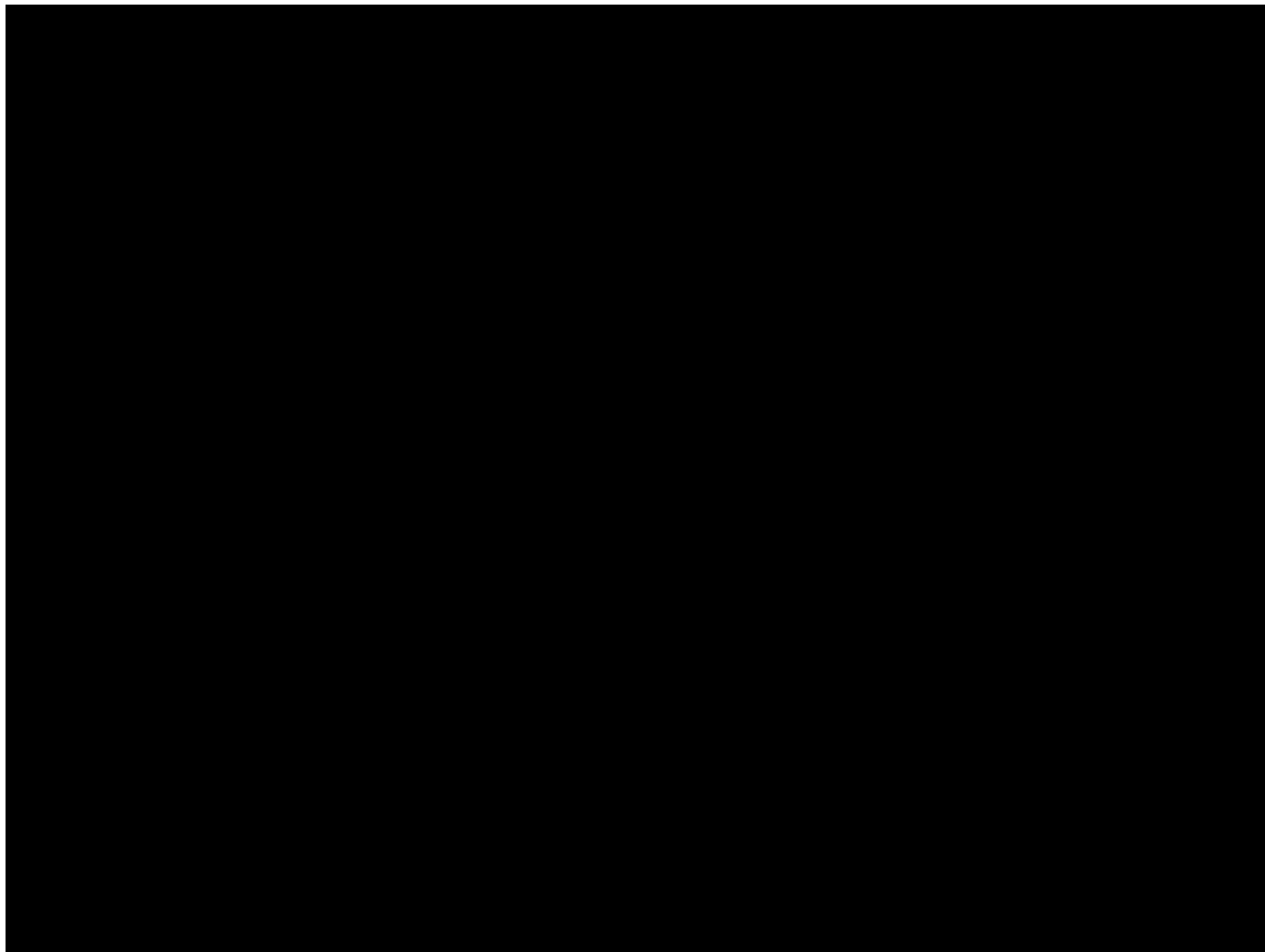- holding back
- hauling off
- pushing apart

Proximity

when event happens

Escalatory

- threatening gestures
- pointing
- throwing
- pushing
- shoving
- hitting
- kicking
- weapon

Example Run

number-of-bystanders
26b

setup

go

total interveners
16

percent interveners
61.54

snapshot

---------------Environment---------------

density
low

location
outside bar

day
sunday

time
3:45 am

---------------Intervener Data---------------

▲ **percent bouncers**
0

■ **percent female**
18.75

● **percent male**
81.25

○ ■ △ **knows party**
13

close proximity to event
9

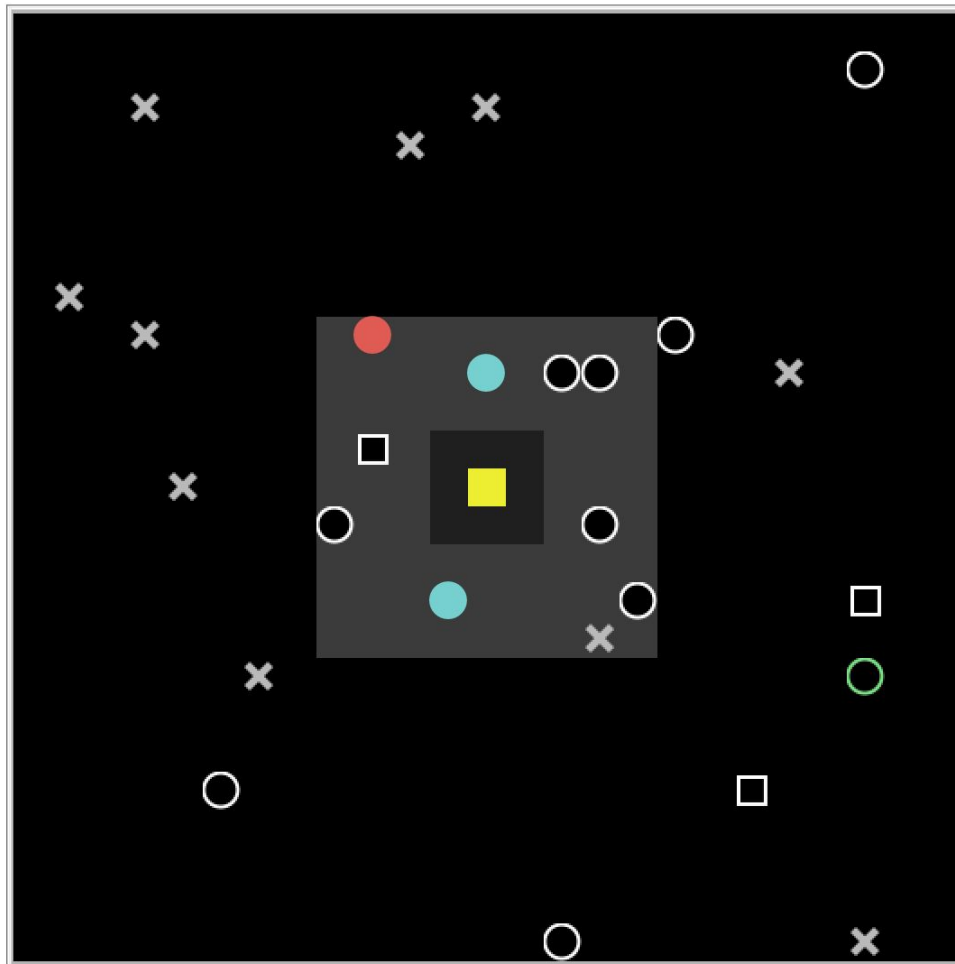### Action Type

count

16

0

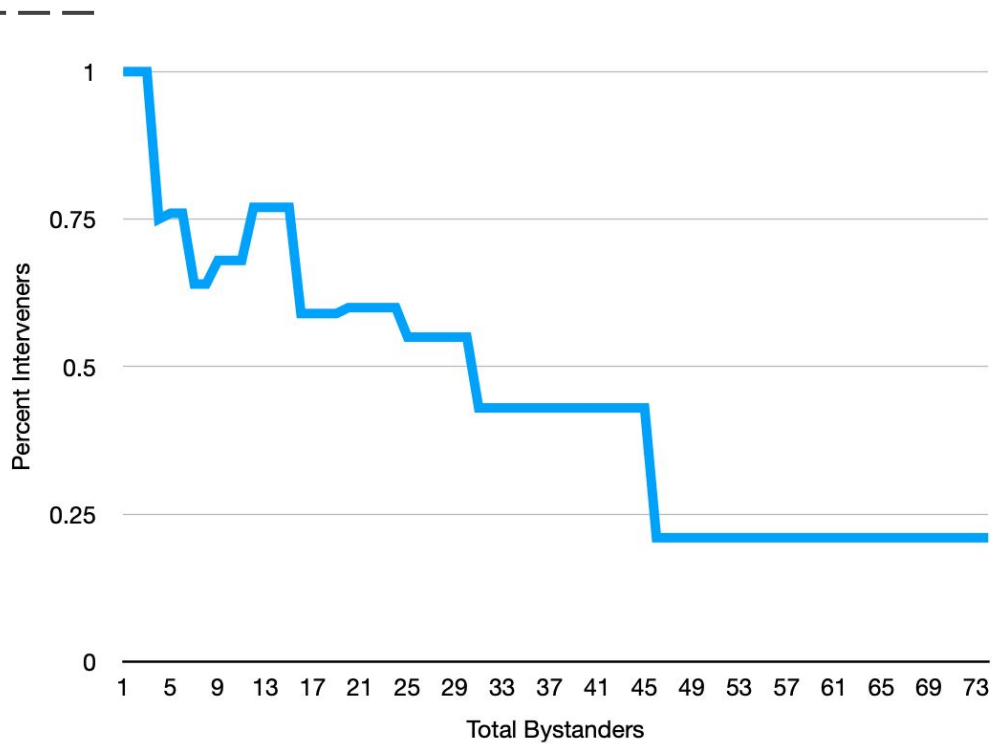0   action   4
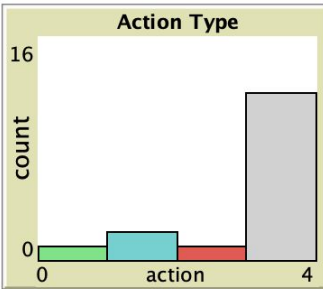
de-escalatory

escalatory

both

Model Performance
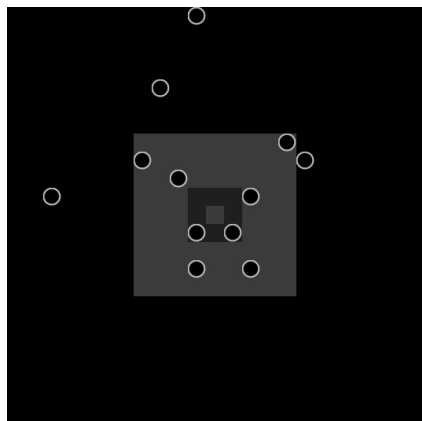

Performs as expected

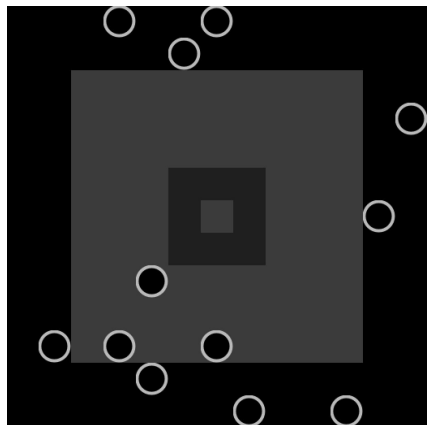More People = Less Help

Conclusions

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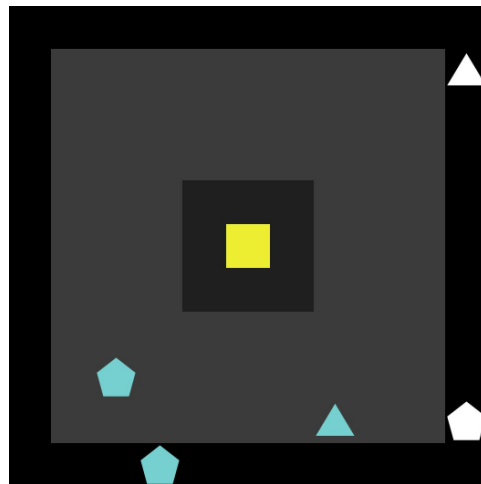## Spatial Distribution

low density

high density

both displays have 12 bystanders

No Bystander Data

Limits prediction

References

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Fischer, P., et. all. (2011). The bystander-effect: a
    meta-analytic review on bystander intervention in dangerous and
    non-dangerous emergencies. Psychological bulletin, 137(4), 517-537.
    https://doi-org.proxy.wm.edu/10.1037/a0023304
Heuvel, Joey & Treur, Jan. (2020). To Help or Not to Help: A
    Network Modelling Approach to the Bystander Effect.
    10.1007/978-3-030-65596-9_64.
Liebst, L. S., Philpot, R., Bernasco, W., Dausel, K. L., Ejbye-Ernst,
    P., Nicolaisen, M. H., & Lindegaard, M. R. (2019). Social relations
    and presence of others predict bystander intervention: Evidence from
    violent incidents captured on CCTV. Aggressive behavior, 45(6),
    598-609. https://doi.org/10.1002/ab.21853