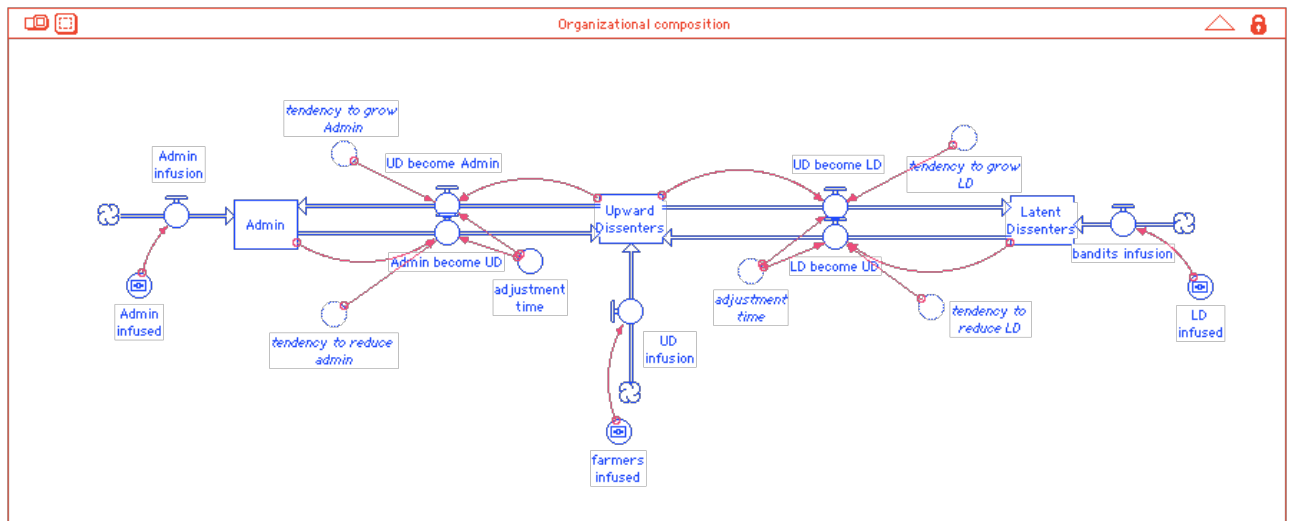


## Appendix Model sectors and equations



Organizational\_composition =

$Admin(t) = Admin(t - dt) + (UD\_become\_Admin + Admin\_infusion - Admin\_become\_UD) * dt$

INIT Admin = 5

INFLOWS:

UD\_become\_Admin =

$1 * Upward\_Dissenters * tendency\_to\_grow\_Admin / adjustment\_time$

Admin\_infusion = PULSE(Admin\_infused\*dt/dt,0,0)

OUTFLOWS:

$Admin\_become\_UD = 2 * 1 * Admin * tendency\_to\_reduce\_admin / adjustment\_time$

$Latent\_Dissenters(t) = Latent\_Dissenters(t - dt) + (UD\_become\_LD + bandits\_infusion - LD\_become\_UD) * dt$

INIT Latent\_Dissenters = 5

INFLOWS:

$UD\_become\_LD = 1 * Upward\_Dissenters * tendency\_to\_grow\_LD / adjustment\_time$

bandits\_infusion = PULSE(LD\_infused\*dt/dt,0,0)

OUTFLOWS:

$LD\_become\_UD = 2 * 1 * Latent\_Dissenters * tendency\_to\_reduce\_LD / adjustment\_time$

$Upward\_Dissenters(t) = Upward\_Dissenters(t - dt) + (UD\_infusion + LD\_become\_UD + Admin\_become\_UD - UD\_become\_Admin - UD\_become\_LD) * dt$

INIT Upward\_Dissenters = 10

INFLOWS:

UD\_infusion = PULSE(farmers\_infused\*dt/dt,0,0)

$LD\_become\_UD = 2 * 1 * Latent\_Dissenters * tendency\_to\_reduce\_LD / adjustment\_time$

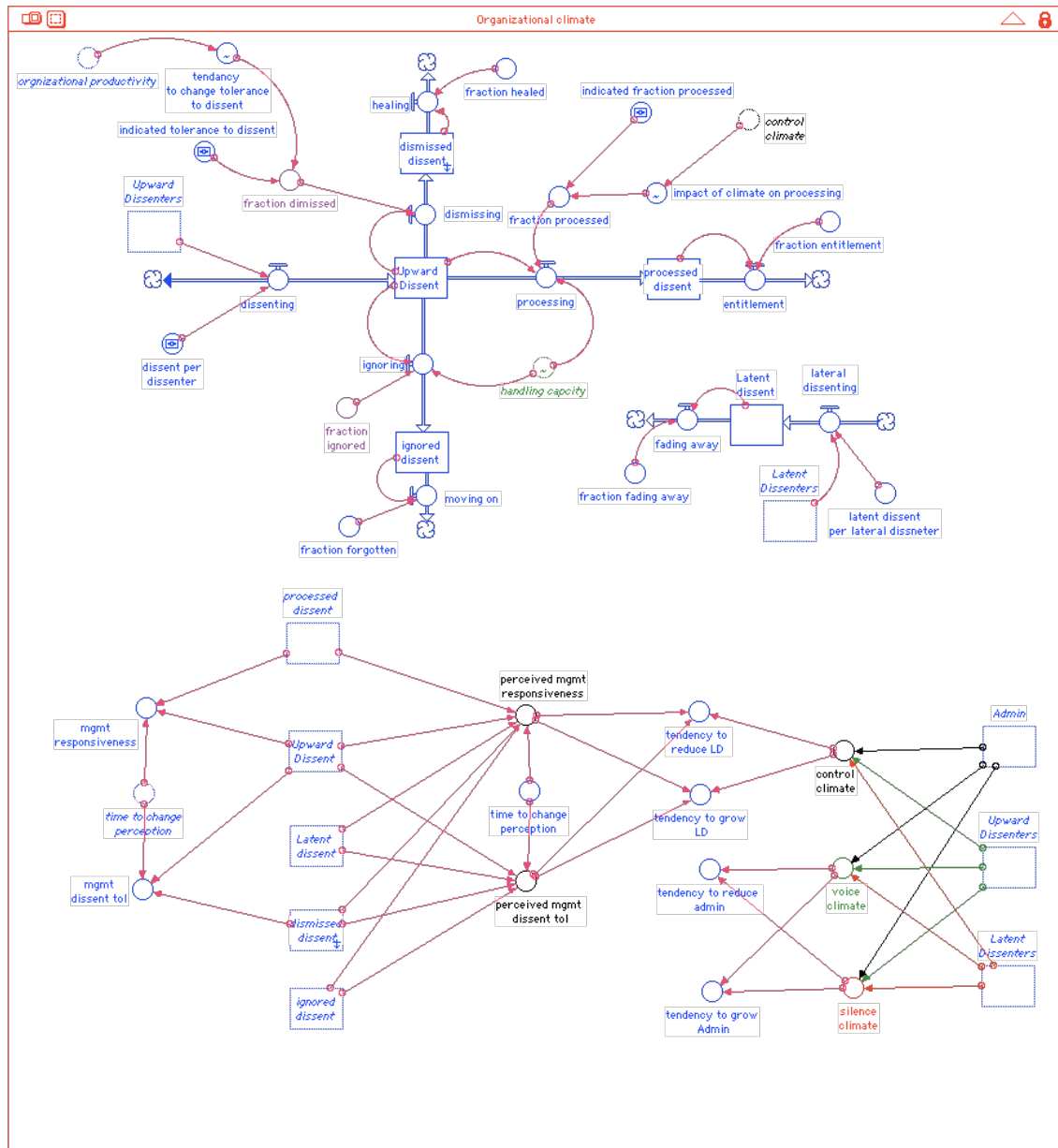
$Admin\_become\_UD = 2 * 1 * Admin * tendency\_to\_reduce\_admin / adjustment\_time$

OUTFLOWS:

UD\_become\_Admin =

$1 * Upward\_Dissenters * tendency\_to\_grow\_Admin / adjustment\_time$

UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time  
adjustment\_time = 1  
adjustment\_time = 1  
Admin\_infused = 0  
farmers\_infused = 0  
LD\_infused = 0  
tendency\_to\_reduce\_LD =  
(control\_climate\*perceived\_mgmt\_responsiveness\*perceived\_mgmt\_dissent\_tol)  
tendency\_to\_grow\_Admin = silence\_climate/voice\_climate  
tendency\_to\_grow\_LD =  
1/(control\_climate\*perceived\_mgmt\_dissent\_tol\*perceived\_mgmt\_responsiveness)  
tendency\_to\_reduce\_admin = voice\_climate/silence\_climate



Organizational\_climate =

Admin(t) = Admin(t - dt) + (UD\_become\_Admin + Admin\_infusion - Admin\_become\_UD) \* dt

INIT Admin = 5

INFLOWS:

UD\_become\_Admin =

1\*Upward\_Dissenters\*tendency\_to\_grow\_Admin/adjustment\_time

Admin\_infusion = PULSE(Admin\_infused\*dt/dt,0,0)

OUTFLOWS:

Admin\_become\_UD = 2\*1\*Admin\*tendency\_to\_reduce\_admin/adjustment\_time

dismissed\_dissent(t) = dismissed\_dissent(t - dt) + (dismissing - healing) \* dt

INIT dismissed\_dissent = 1

INFLOWS:

dismissing = Upward\_Dissent\*fraction\_dimissed

OUTFLOWS:

healing = dismissed\_\_dissent\*fraction\_healed

dismissed\_\_dissent(t) = dismissed\_\_dissent(t - dt) + (dismissing - healing) \* dt

INIT dismissed\_\_dissent = 1

INFLOWS:

dismissing = Upward\_Dissent\*fraction\_dimissed

OUTFLOWS:

healing = dismissed\_\_dissent\*fraction\_healed

ignored\_dissent(t) = ignored\_dissent(t - dt) + (ignoring - moving\_on) \* dt

INIT ignored\_dissent = 1

INFLOWS:

ignoring = Upward\_Dissent\*fraction\_ignored/handling\_capcity

OUTFLOWS:

moving\_on = ignored\_dissent\*fraction\_forgotten

ignored\_dissent(t) = ignored\_dissent(t - dt) + (ignoring - moving\_on) \* dt

INIT ignored\_dissent = 1

INFLOWS:

ignoring = Upward\_Dissent\*fraction\_ignored/handling\_capcity

OUTFLOWS:

moving\_on = ignored\_dissent\*fraction\_forgotten

Latent\_Dissenters(t) = Latent\_Dissenters(t - dt) + (UD\_become\_LD + bandits\_infusion - LD\_become\_UD) \* dt

INIT Latent\_Dissenters = 5

INFLOWS:

UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time

bandits\_infusion = PULSE(LD\_infused\*dt/dt,0,0)

OUTFLOWS:

LD\_become\_UD = 2\*1\*Latent\_Dissenters\*tendency\_to\_\_reduce\_LD/adjustment\_time

Latent\_Dissenters(t) = Latent\_Dissenters(t - dt) + (UD\_become\_LD + bandits\_infusion - LD\_become\_UD) \* dt

INIT Latent\_Dissenters = 5

INFLOWS:

UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time

bandits\_infusion = PULSE(LD\_infused\*dt/dt,0,0)

OUTFLOWS:

LD\_become\_UD = 2\*1\*Latent\_Dissenters\*tendency\_to\_\_reduce\_LD/adjustment\_time

Latent\_\_dissent(t) = Latent\_\_dissent(t - dt) + (lateral\_dissenting - fading\_away) \* dt

INIT Latent\_\_dissent = 1

INFLOWS:

lateral\_dissenting = Latent\_Dissenters\*latent\_dissent\_per\_lateral\_dissneter

OUTFLOWS:

fading\_away = Latent\_\_dissent\*fraction\_fading\_away

Latent\_\_dissent(t) = Latent\_\_dissent(t - dt) + (lateral\_dissenting - fading\_away) \* dt

INIT Latent\_\_dissent = 1

INFLOWS:

lateral\_dissenting = Latent\_Dissenters\*latent\_dissent\_per\_lateral\_dissneter

OUTFLOWS:

fading\_away = Latent\_dissent\*fraction\_fading\_away

processed\_dissent(t) = processed\_dissent(t - dt) + (processing - entitlement) \* dt

INIT processed\_dissent = 1

INFLOWS:

processing = min(fraction\_processed\*handling\_capacity,Upward\_Dissent)

OUTFLOWS:

entitlement = processed\_dissent\*fraction\_entitlement

processed\_dissent(t) = processed\_dissent(t - dt) + (processing - entitlement) \* dt

INIT processed\_dissent = 1

INFLOWS:

processing = min(fraction\_processed\*handling\_capacity,Upward\_Dissent)

OUTFLOWS:

entitlement = processed\_dissent\*fraction\_entitlement

Upward\_Dissenters(t) = Upward\_Dissenters(t - dt) + (UD\_infusion + LD\_become\_UD  
+ Admin\_become\_UD - UD\_become\_Admin - UD\_become\_LD) \* dt

INIT Upward\_Dissenters = 10

INFLOWS:

UD\_infusion = PULSE(farmers\_infused\*dt/dt,0,0)

LD\_become\_UD = 2\*1\*Latent\_Dissenters\*tendency\_to\_reduce\_LD/adjustment\_time

Admin\_become\_UD = 2\*1\*Admin\*tendency\_to\_reduce\_admin/adjustment\_time

OUTFLOWS:

UD\_become\_Admin =

1\*Upward\_Dissenters\*tendency\_to\_grow\_Admin/adjustment\_time

UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time

Upward\_Dissenters(t) = Upward\_Dissenters(t - dt) + (UD\_infusion + LD\_become\_UD  
+ Admin\_become\_UD - UD\_become\_Admin - UD\_become\_LD) \* dt

INIT Upward\_Dissenters = 10

INFLOWS:

UD\_infusion = PULSE(farmers\_infused\*dt/dt,0,0)

LD\_become\_UD = 2\*1\*Latent\_Dissenters\*tendency\_to\_reduce\_LD/adjustment\_time

Admin\_become\_UD = 2\*1\*Admin\*tendency\_to\_reduce\_admin/adjustment\_time

OUTFLOWS:

UD\_become\_Admin =

1\*Upward\_Dissenters\*tendency\_to\_grow\_Admin/adjustment\_time

UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time

Upward\_Dissent(t) = Upward\_Dissent(t - dt) + (dissenting - ignoring - dismissing -  
processing) \* dt

INIT Upward\_Dissent = 1

INFLOWS:

dissenting = Upward\_Dissenters\*dissent\_per\_dissenter

OUTFLOWS:

ignoring = Upward\_Dissent\*fraction\_ignored/handling\_capacity

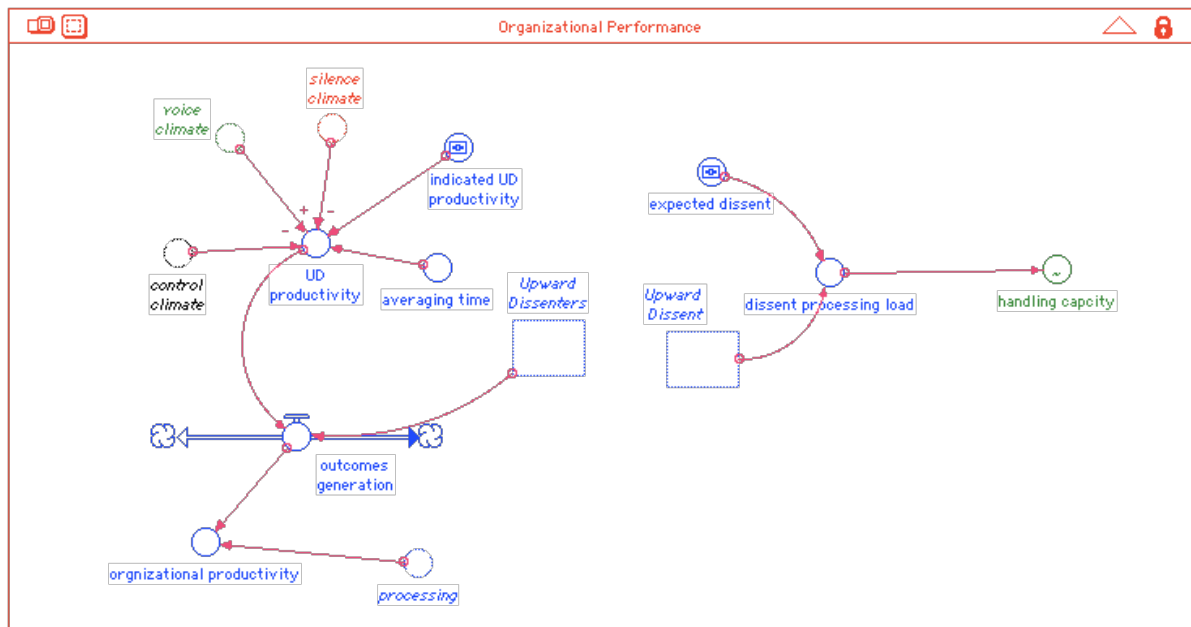
dismissing = Upward\_Dissent\*fraction\_dimissed

```

processing = min(fraction_processed*handling_capacity,Upward_Dissent)
Upward_Dissent(t) = Upward_Dissent(t - dt) + (dissenting - ignoring - dismissing -
processing) * dt
INIT Upward_Dissent = 1
INFLOWS:
dissenting = Upward_Dissenters*dissent_per_dissenter
OUTFLOWS:
ignoring = Upward_Dissent*fraction_ignored/handling_capacity
dismissing = Upward_Dissent*fraction_diminished
processing = min(fraction_processed*handling_capacity,Upward_Dissent)
control_climate = 3*Admin/(Upward_Dissenters+Latent_Dissenters)
control_climate = 3*Admin/(Upward_Dissenters+Latent_Dissenters)
dissent_per_dissenter = 0.100000000000000001
fraction_ignored = 0.25
fraction_diminished =
indicated_tolerance_to_dissent*tendency_to_change_tolerance_to_dissent
fraction_entitlement = 0.5
fraction_fading_away = 0.25
fraction_forgotten = 0.25
fraction_healed = 0.25
fraction_processed =
2*indicated_fraction_processed*impact_of_climate_on_processing
indicated_fraction_processed = 0.5
indicated_tolerance_to_dissent = 0.25
latent_dissent_per_lateral_dissenter = 0.0500000000000000003
mgmt_dissent_tol =
smth1((1/1)*Upward_Dissent/(dismissed_dissent),time_to_change_perception,1)
mgmt_responsiveness =
smth1((1/1)*processed_dissent/Upward_Dissent,time_to_change_perception,1)
organizational_productivity = outcomes_generation/processing
perceived_mgmt_responsiveness =
smth1((4/1)*processed_dissent/(Upward_Dissent+Latent_dissent+dismissed_diss
sent+ignored_dissent), time_to_change_perception, 1)
perceived_mgmt_dissent_tol =
smth1((3/1)*Upward_Dissent/(ignored_dissent+dismissed_dissent+Latent_disse
nt),time_to_change_perception,1)
silence_climate = 3*Latent_Dissenters/(Admin+Upward_Dissenters)
tendency_to_reduce_LD =
(control_climate*perceived_mgmt_responsiveness*perceived_mgmt_dissent_tol)
tendency_to_grow_Admin = silence_climate/voice_climate
tendency_to_grow_LD =
1/(control_climate*perceived_mgmt_dissent_tol*perceived_mgmt_responsiveness)
tendency_to_reduce_admin = voice_climate/silence_climate
time_to_change_perception = 1
time_to_change_perception = 1
voice_climate = Upward_Dissenters/(Latent_Dissenters+Admin)

```

handling\_capacity = GRAPH(dissent\_processing\_load)  
 (0.00, 1.00), (0.2, 1.00), (0.4, 1.00), (0.6, 1.00), (0.8, 1.00), (1.00, 1.00), (1.20, 0.951),  
 (1.40, 0.819), (1.60, 0.654), (1.80, 0.39), (2.00, 0.0769)  
 impact\_of\_climate\_on\_processing = GRAPH(control\_climate)  
 (0.00, 0.63), (0.2, 0.63), (0.4, 0.628), (0.6, 0.614), (0.8, 0.575), (1.00, 0.5), (1.20,  
 0.433), (1.40, 0.371), (1.60, 0.334), (1.80, 0.306), (2.00, 0.292)  
 tendency\_to\_change\_tolerance\_to\_dissent = GRAPH(orgnizational\_productivity)  
 (0.5, 3.00), (0.6, 2.57), (0.7, 2.10), (0.8, 1.69), (0.9, 1.27), (1.00, 1.00), (1.10, 0.879),  
 (1.20, 0.762), (1.30, 0.696), (1.40, 0.659), (1.50, 0.659)



Organizational\_Performance =  
 Upward\_Dissenters(t) = Upward\_Dissenters(t - dt) + (UD\_infusion + LD\_become\_UD  
 + Admin\_become\_UD - UD\_become\_Admin - UD\_become\_LD) \* dt  
 INIT Upward\_Dissenters = 10  
 INFLOWS:  
 UD\_infusion = PULSE(farmers\_infused\*dt/dt,0,0)  
 LD\_become\_UD = 2\*1\*Latent\_Dissenters\*tendency\_to\_reduce\_LD/adjustment\_time  
 Admin\_become\_UD = 2\*1\*Admin\*tendency\_to\_reduce\_admin/adjustment\_time  
 OUTFLOWS:  
 UD\_become\_Admin =  
 1\*Upward\_Dissenters\*tendency\_to\_grow\_Admin/adjustment\_time  
 UD\_become\_LD = 1\*Upward\_Dissenters\*tendency\_to\_grow\_LD/adjustment\_time  
 Upward\_Dissent(t) = Upward\_Dissent(t - dt) + (dissenting - ignoring - dismissing -  
 processing) \* dt  
 INIT Upward\_Dissent = 1  
 INFLOWS:  
 dissenting = Upward\_Dissenters\*dissent\_per\_dissenter  
 OUTFLOWS:

```

ignoring = Upward_Dissent*fraction_ignored/handling_capcity
dismissing = Upward_Dissent*fraction_dimissed
processing = min(fraction_processed*handling_capcity,Upward_Dissent)
UNATTACHED:
outcomes_generation = UD_productivity*(Upward_Dissenters)
averaging_time = 2
control_climate = 3*Admin/(Upward_Dissenters+Latent_Dissenters)
dissent_processing_load = Upward_Dissent/(expected_dissent)
expected_dissent = 1
indicated_UD_productivity = 0.05
orgnizational_productivity = outcomes_generation/processing
silence_climate = 3*Latent_Dissenters/(Admin+Upward_Dissenters)
UD_productivity =
smth1(indicated_UD_productivity*voice_climate/(silence_climate*control_climate),
averaging_time,indicated_UD_productivity)
voice_climate = Upward_Dissenters/(Latent_Dissenters+Admin)
handling_capcity = GRAPH(dissent_processing_load)
(0.00, 1.00), (0.2, 1.00), (0.4, 1.00), (0.6, 1.00), (0.8, 1.00), (1.00, 1.00), (1.20, 0.951),
(1.40, 0.819), (1.60, 0.654), (1.80, 0.39), (2.00, 0.0769)

```