Signaling

Emergence in complex systems

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DEC

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2. Signaling
   - Thompson Gazelles
   - Costly signal theory
   - Non-human and human examples

3. Bonus
   - Revolutions
   - Mandatory patriotism

Gazelle and antelope stotting

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Gazelles and springbok antelopes jump high up in the air when they spot (certain) predators. Why?

A) Because it informs the predator about the gazelle's current physical form.

B) To warn other antelopes of the presence of the predator.

C) To confuse the predator.

D) Because they can. You would to if you could jump up two meters in the air whilst running.

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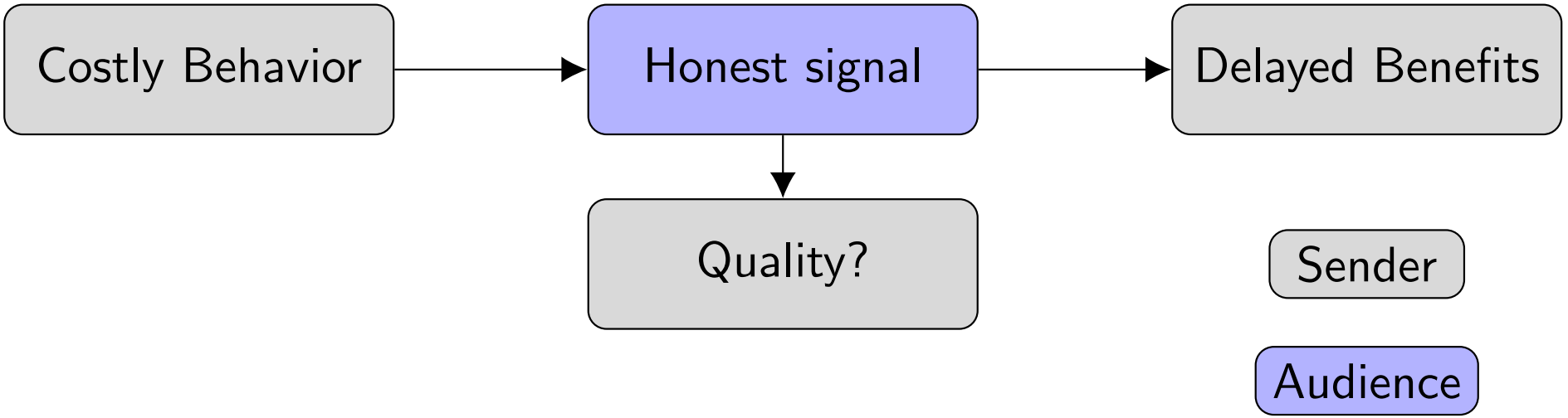
Costly signal theory [Zahavi, 1975, Grafen, 1990]



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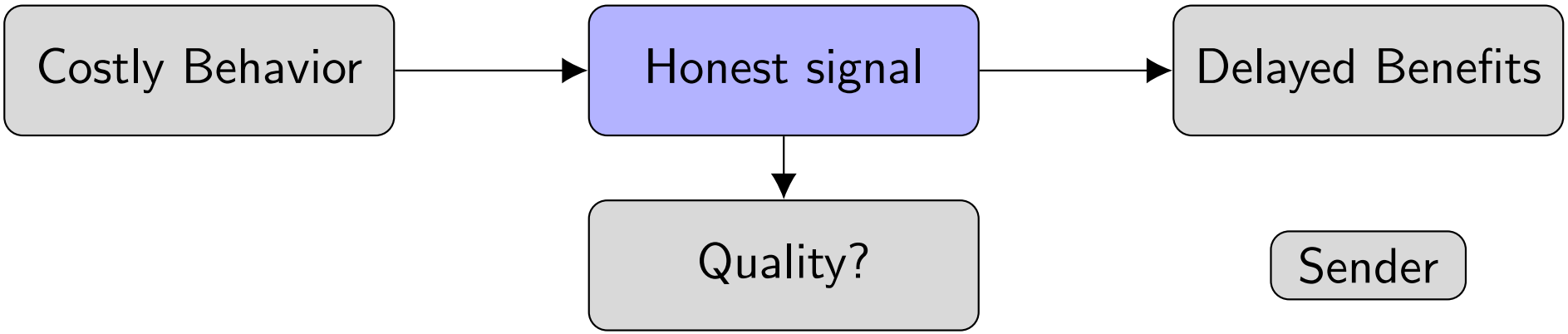
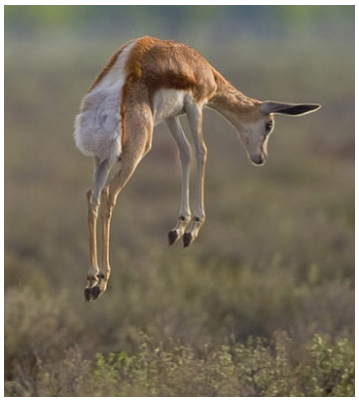


Sender

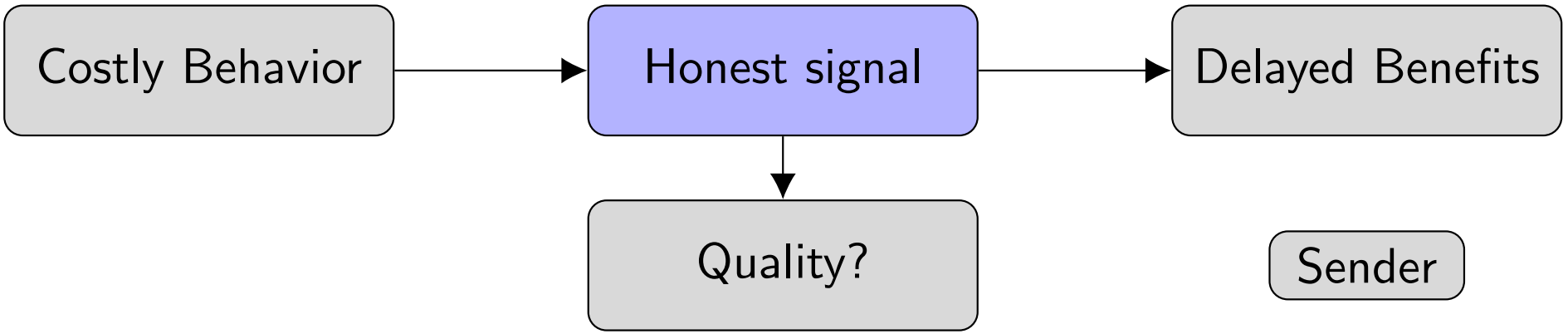
Audience

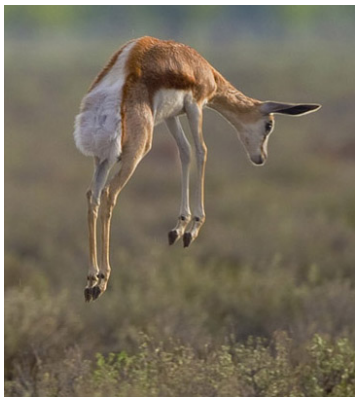


Jumps high up in the air

Pursues another prey

Costly signal theory [Zahavi, 1975, Grafen, 1990]





Jumps high up in the air — only if in good shape

Competition between gazelles leads to signal honesty
(via high enough costs)

Pursues another prey

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Other examples (not just behavior)

Male ducks are more colorful

Female seahorses are more colorful

Male widowbirds with long tails are more attractive

Helpful Arabian babblers gain social prestige

Example: a thorough examination [Moller, 1980-2000s...]

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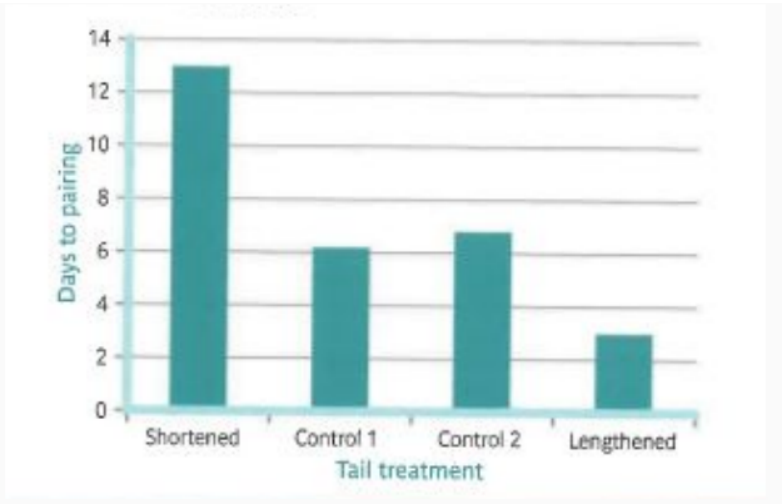

Females prefer males with elongated tails [Moller, 1988]

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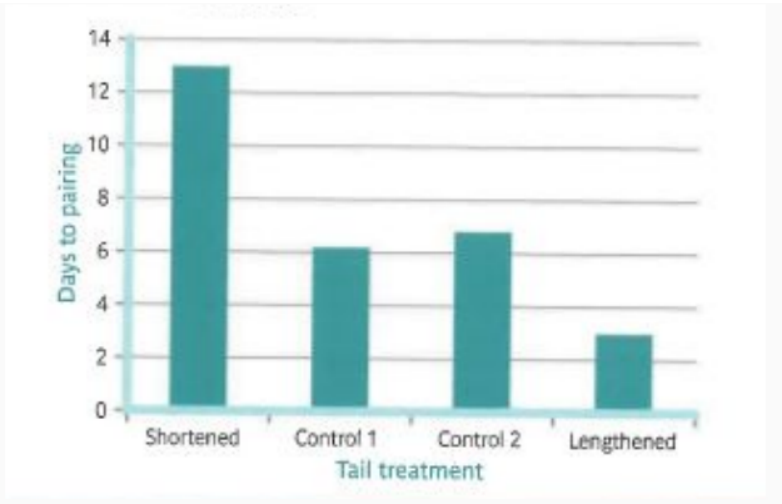

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Elongated tails are a **handicap** [Moller Szep, 2002]

$\Longrightarrow$ tail-length reflects a *trade-off*

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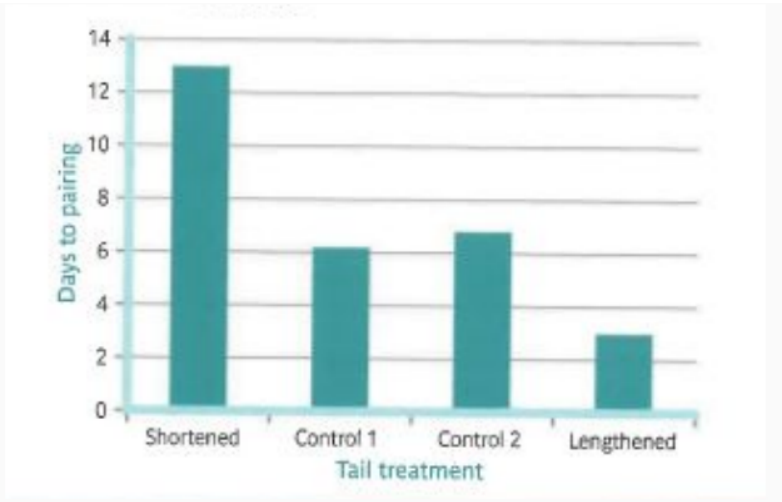

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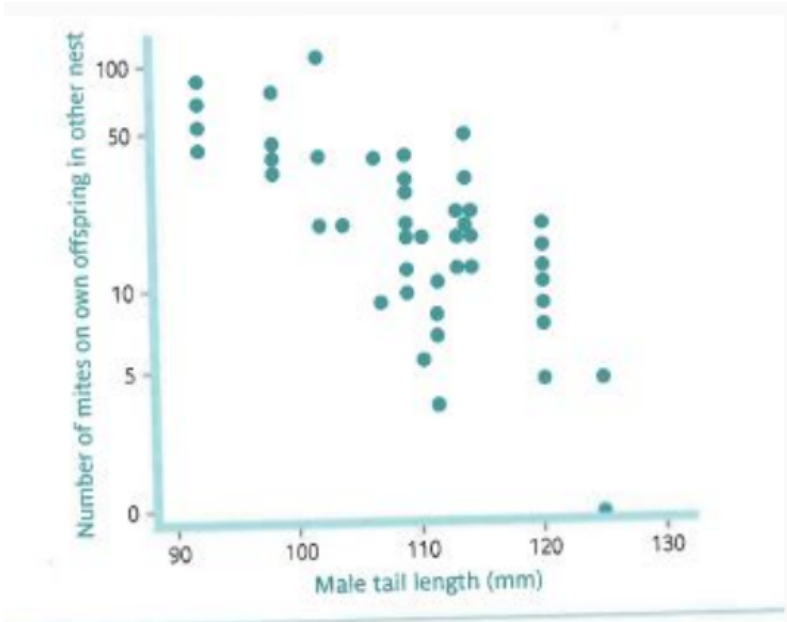


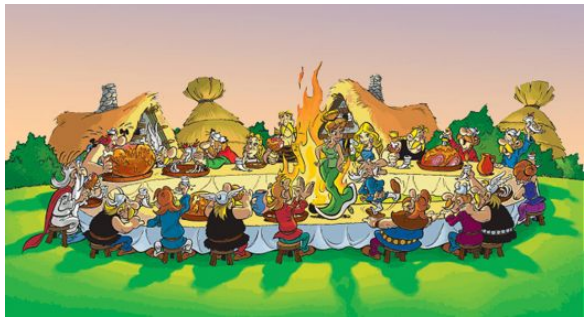
Tail length positively correlates with:

- absence of nest parasites [Moller, 1990]
- predator evasion [Moller Nielsen, 1997]

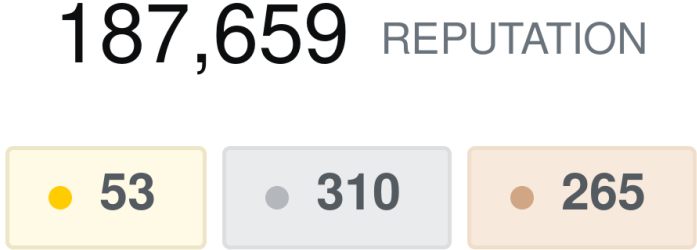
Application to human behavior, prosocial and not

Conspicuous consumption may signal wealth[Veblen, 1973]

Third-party punishment may signal trustworthiness [Jordan et al., 2016]



Martu hunters may signal their hunting skills by providing food unconditionally [Smith and Bird, 2000]



The best contributors on Stackoverflow gain high status (admin rights...): contributions could signal expertise

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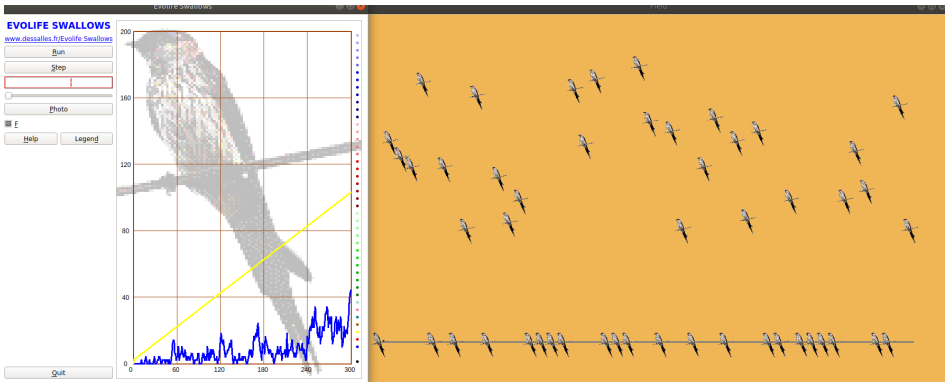
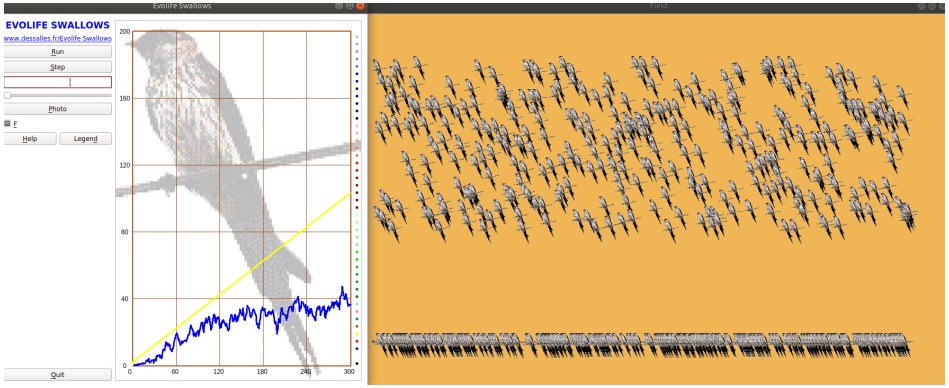
Revolutions and gregarious swallows





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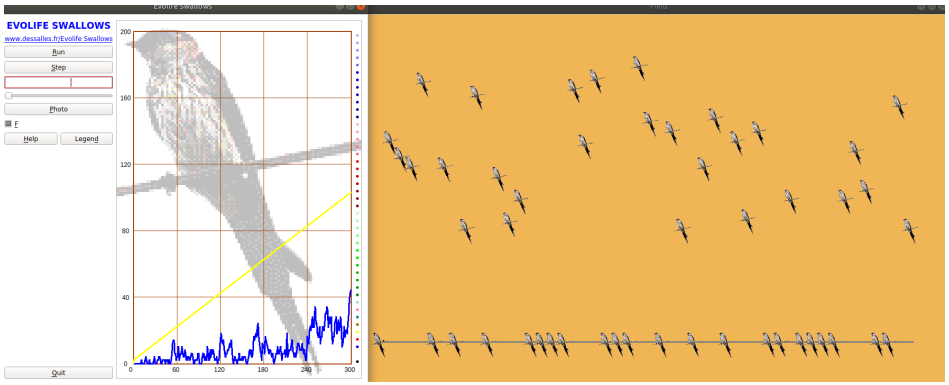

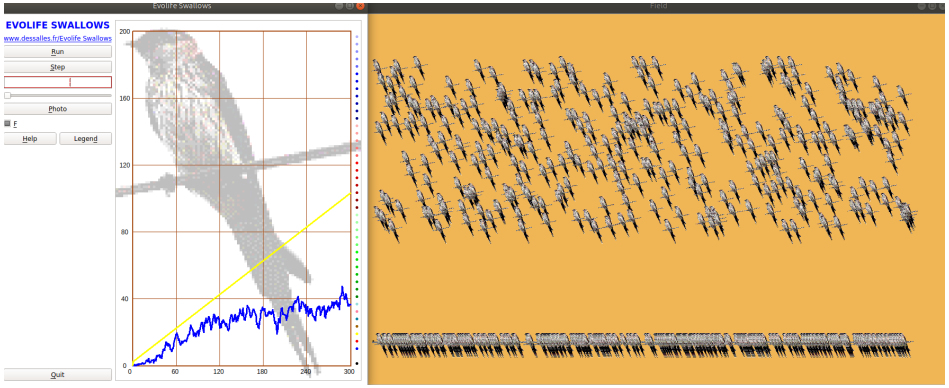

Should I join a revolutionary protest?

When I'm (close to) alone in a *famously* repressive State:

- Personal benefit: probably null
- Personal cost: high risk of being incarcerated, tortured, shot at...

When many are already protesting and State violence decreases:

- Potential social benefits
- Much lower risk $p * C$

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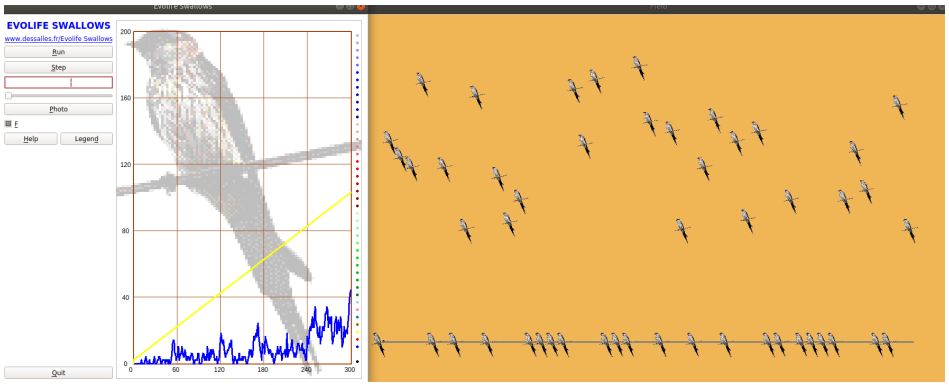

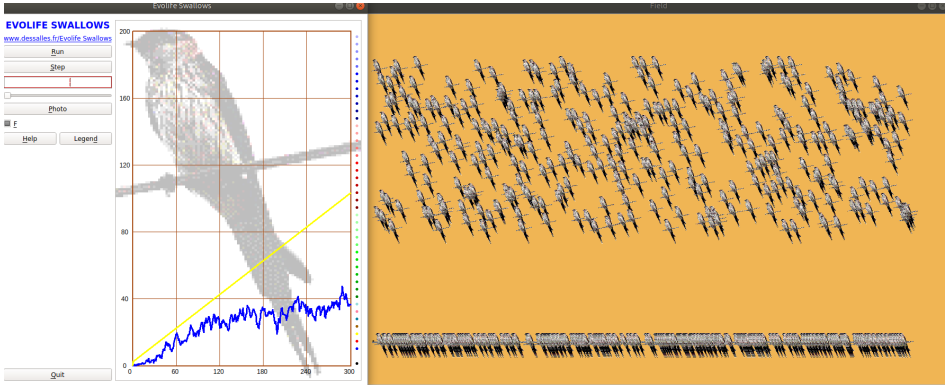

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→ **"Tipping point"** dynamics characteristic of norm shift at the macro level [Schelling, 2006]

Revolutions and gregarious swallows

Anti-governmental protest in Tunisia, 2011

Alyssa Milano encouraged using #MeToo, 2017

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Mandatory displays of patriotism

(a) Gang tattoo (Yakuza)

(b) Ritual scars (Oromo people)

(c) Remains of the 800 Martyrs of Otranto (1480)

Mandatory displays of patriotism

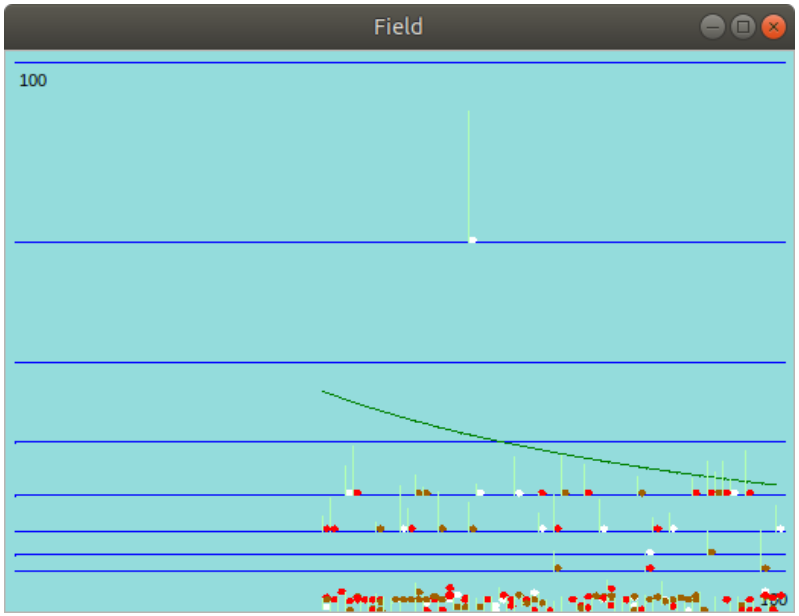
Problem [Sosis et al., 2007, Whitehouse, 2018]

- Mandatory displays of patriotism
- Whose cost increases in time of war

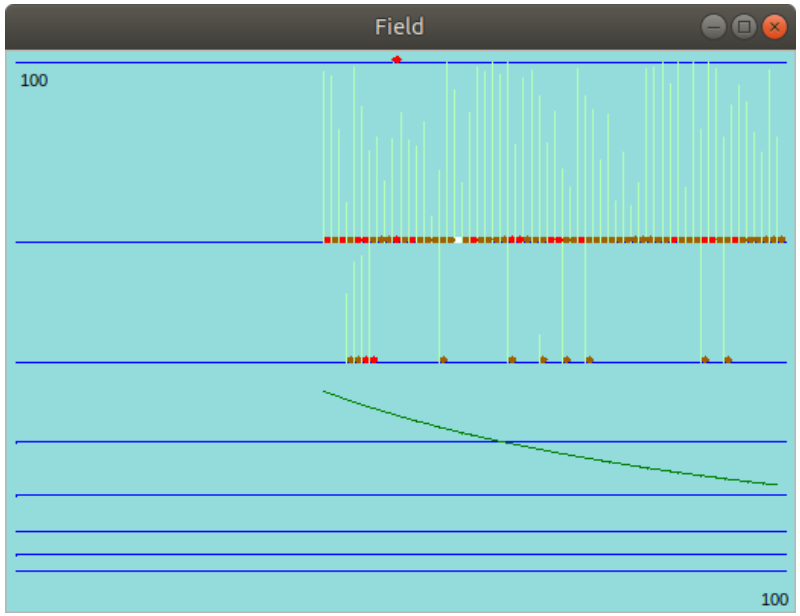
Hypothesis: second-order signals [Lie-Panis & Dessalles, in prep.]

- Outrage at other's (perceived) insufficient patriotism: $S \leftarrow S + s$
- Which entails social cost P to targets

Mandatory displays of patriotism



(a) $P = 0,\ s = 2$



(b) $P = 5,\ s = 2$

Attained signal levels for null and relatively small punishment cost P

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