Why net censorship in times of political unrest results in more violent uprisings: A social simulation experiment on the UK riots [*]

Working paper

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Abstract

Following the 2011 wave of political unrest, going from the Arab Spring to UK riots, the formation of a large consensus around Internet censorship is underway. Beyond all political consideration of consequences in terms of freedom of expression, the present paper adopts a social simulation approach to show that the decision to

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"regulate" or restrict social media in situations of civil unrest results in higher levels of violence. Building on Epstein's (2002) agent based model, several alternative scenarios are generated. Systemic optimum, represented by complete absence of censorship, not only corresponds to lower levels of violence over time, but allows for significant periods of social peace after each outburst.

Keywords: UK riots, Arab Spring, civil violence, Internet censorship, agent-based modelling, social simulation, social media, tactical media, flash mobs.

> It's time we heard a little bit less about the economic and sociological justifications for what is in my view nothing less than wanton criminality.
> Boris Johnson, Mayor of London, Clapham, 9th August 2011.

> We are not social scientists. We have to deal with urgent situations.
> Paul McKeever, Police Federation Chairman, SkyNews, 11th August 2011.

> Nowadays sabotaging the social machine with any real effect involves reappropriating and reinventing the ways of interrupting its networks.
> The Invisible Committee, The Coming Insurrection, Semiotext(e), 2009, p. 112.

1 The political role of social media: moving away from double standards

In the wake of August 2011 outburst of civil unrest in the UK, several voices from the mainstream media as well as diverse political figures, from London Mayor technology adviser Mike Butcher [1] up to the Prime Minister David Cameron himself [2], have pointed at social media use as playing a major role in the riots.

Meetings between Government officials and representatives of the main social networking platforms involved (Facebook, Twitter and BBM) have been held to establish guidelines for a more stringent regulation of social media and Internet communication in general, in order to avoid tactical use of mobile networks by riot "flashmobs" or to counter online social influence mechanisms. The Internet kill switch solution (i.e. temporary shutdown of entire telecommunication networks), infamously and uneffectively attempted in Egypt during the January 2011 revolutionary outbreak, has also been proposed.

Of course the parallel between the regulating frenzy of Britain's conservative government and the disastrous electronic censorship of Hosni Mubarack's dying regime,

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[1] See Mail Online, 8th August 2011, URL: http://www.dailymail.co.uk/news/article-2023924/London-riots-2011-BlackBerry-Messenger-shut-unbelievable.html

[2] See Forbes, 12th August 2011, URL: http://www.forbes.com/sites/timworstall/2011/08/12/britain-to-censor-twitter-facebook-other-social-media-sites/

highlights the utterly ambiguous attitude of European political establishment and mainstream media towards Internet social communication. In a (regrettably not infrequent) display of duplicity, the same information technologies that had been presented as tools of liberation in the height of the Arab Spring, have been portrayed as threats to the very values of freedom and peace that Western governments allegedly stand for.

So the question of why social media would bring democracy to developing countries and anarchy to Western ones remains open. Some analysts interpret this contradiction as a strategy which, by creating a climate of moral panic surrounding popular culture, distracts from, and smooths away, the societal issues underlying the uprisings (Fuchs, 2011).

These arguments have received a cold welcome from British authorities, worried that "economic and sociological" explanations of the recent events would be used as "justifications" of more and more confrontational means of political dissent. Beyond the reactions prompted in the academic community by such controversy [3], what can we, as social scientists, say about the role of social media in assisting or even encouraging widespread political conflict? Very little indeed, insofar as data on actual social media use and traffic during the UK riots are not available. Gathering them would take months and, given current restrictions on proprietary social networking software, would probably be far from complete. Moreover, what would be the way of delivering robust, insightful social explanantions of such complex social processes, in a cultural environment dominated by mainstream media that spit out "quick and dirty" analyses by the hour?

The best approach is a more innovative one, relying on agent-based social simulation. This methodology compares alternative computer-generated socially-consistent scenarios to detect and assess variables coming into play within specific social processes [4]. One of these variables is the use of social media to organize flash-mobs in order to build field-awareness in urban uprising settings.

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[3]See the open letter of the presidency of British Sociological Association (BSA), published on 11th August 2011 in *The Guardian*, URL: http://www.guardian.co.uk/uk/2011/aug/11/sociologists-offer-unravel-riots

[4]Our approach to this method is presented in Tubaro and Casilli (2010).

This paper aims to show that the decision to repress and censor social media in a situation of civil unrest – beyond all political consideration of consequences in terms of repression of net neutrality and freedom of expression – is suboptimal even as to its expected impact on civil violence.

2 Epstein's civil violence model (revisited)

Social scientists have been modelling civil violence via agent-based simulation for almost a decade now [5]. One major contribution – on which our own simulation model will build upon – is undoubtly contained in an article published by Josh Epstein in 2002 (Epstein, 2002). Epstein's model, like all agent-based simulations, is a game-like computer model based on a set of simple rules - and bringing forth complex results. Basically it describes a society where there is only one type of social agent (represented by circles in figure 1). Of course this is clearly an oversimplification, but one which is functional to avoid political splits between insurgents and law-abiding citizens (or rather "looters" and "community heroes", in the rather crude carachterisation adopted by UK conservative milieus). Epstein's standard social agent is an idealtypical individual that can, according to his/her context of social interaction, adopt a violent style of expression of political dissent.

The agent's behaviour is influenced by several variables, the first one being his/her personal level of political dissatisfaction ("grievance", indicated by lighter or darker shades of green colour in figure 1). This can lead the agent to abandon his/her state of quiet and become an active protester (red coloured circles in figure 1). However, the decision to act out – whether it is to go on a looting spree or to engage in violent demonstrations – is conditioned by the agent's social surroundings ("neighbourhood" in the model's language). Does s/he detect the presence of police (blue triangles in figure 1) in the surroundings? If the answer to this question is no, s/he will act out. If the answer is yes, another question is asked: is this police presence counterbalanced

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[5]A summary of these researches is contained in Amblard et al. (2010).

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by a sufficient number of actively protesting citizens? If the answer to this second question is yes, then the agent acts out. Sometimes, in an utterly random way, one of the active citizens gets caught by the police and is sent to jail for a given period of time (black circles in figure 1). Again, the apparent simplicity of this rule, is sadly consistent with the many episodes of arbitrary and "swift" justice triggered by the UK government adoption of a hard line in dealing with riot repression.
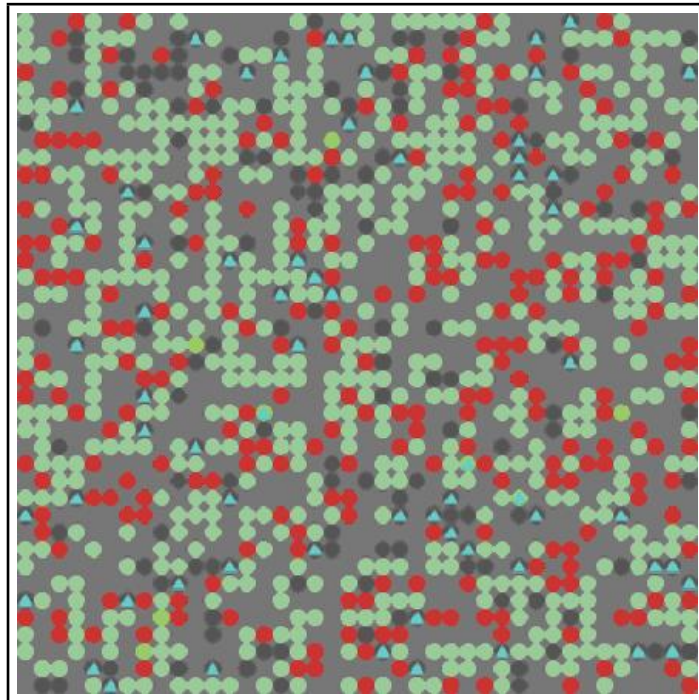

Figure 1: Circles represent social agents, whose level of grievance is indicated by lighter or darker shades of green. Active protesters are colored red and jailed protesters black. Blue triangles represent police officers. Source: "Rebellion" Netlogo model (Wilensky, 2004).

The model takes into account other factors that might mitigate civil violence, such as government legitimacy or the perceived risk of being arrested. Agents have the possibility of moving from one place to another on the social grid to team up with other protesters and engage in coordinated actions. This point will be specifically addressed in the next paragraph, given its significance to the tactical use of social

media [6].

The main result of Epstein's model is that, in a typical situation, civil violence does not look like a linear process. Naïve visions of political conflict as a cumulative process where confrontation escalates until a regime is toppled turn out to be fallacious. Times of unrest bring forth what Epstein describes as a "punctuated equilibrium" (see figure 2): long periods of stability where rebellion is smouldering are followed by short violent outbursts.
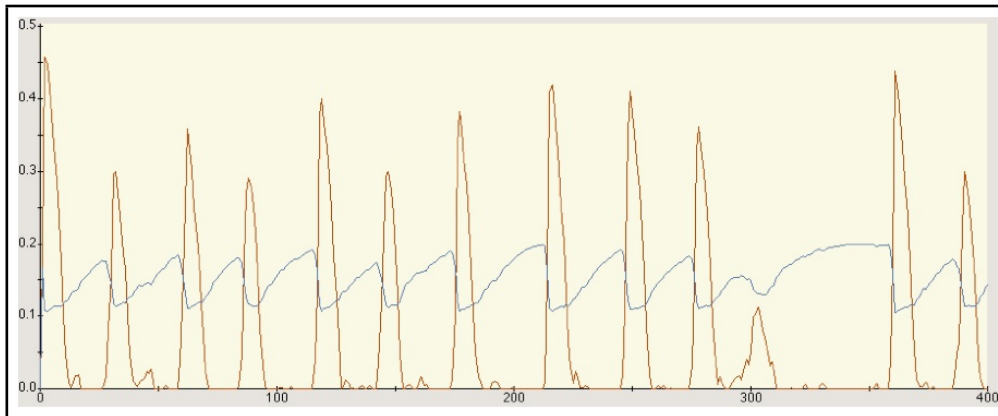

Figure 2: A typical civil unrest pattern: outbursts of violence (red curve) punctuate long periods of stability when political tension is building up (blue curve). Source: Epstein (2002), Fig. 8.

Another variable (called "vision" by Epstein) turns out to be crucial. Vision is an individual agent's ability to scan his/her neighbourhood for signs of cops and/or active protesters. The higher the vision, the wider the agent's range.

What we have done in our version of the model, so to evaluate the tactical use of social media to create flash mobs deploied in a situation of civil violence, is to modify the consequences of "vision". If in the original simulation [7], agents and police officers move to randomly chosen places within their vision range, in our model, a different

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[6]In this paper, tactical use of social media designates the adoption of informal and ad-hoc practices of electronic communication (mainly geolocative media, social networking, texting, and real-time computer conferencing) for the purpose of temporary political confrontation. Our defintion stems from (Garcia and Lovink, 1997)

[7]We have relied on the version of the model that is presented in (Wilensky, 2004), using the NetLogo package for social simulation (Wilensky, 1999) Our revised NetLogo code is provided in Appendix B.

rule has been introduced to make agents move to places in their vision range that are *surrounded by the maximum number of active protesters* [8]. This simple change simulates the behaviour of individuals involved in civil unrest, using BBM or Twitter to detect, and to converge in, hot spots. The result of the modified model (see Appendix B for Netlogo code) is thus consistent with the tactical use of mobile technologies by protesters in order to gain a cognitive advantage against police forces and have a better awareness of the field, its resources and possible weak spots. If the value of vision is higher (like in a situation where online networking tools are widespread and not censored), each agent has complete information as to what is going on even in remote locations. If social communication is censored, the value of vision is lower, and agents have partial or non-existent awareness of their surroundings and tend to move randomly.

3 Internet censorship: a source of protracted high-level violence

Our social simulation code reproduces the functioning of a given social system (presumably an urban setting, such as a city or a borough) over a significant period of time (in practice and for modeling purposes, 1000 time steps) [9], for different values of the parameter vision *caeteris paribus* (cf. Table 2 in Appendix A). Running the model several times generates alternative scenarios (Figure 3), and allows the comparison of the outcomes of lower or higher values of vision – indicating the effects of more or less censorship of social media.

Different patterns of civil unrest over time are generated by different values of

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[8]Another option, suggested to us by an anonymous activist blogger from London, would be to introduce a rule according to which groups of rioters converge in areas where a high number of police officers are attacking isolated agents. This "police violence" rule might be introduced in a subsequent extension of the model, and would provide eyewitness-based structural validations of the model.

[9]The choice of 1000 time steps aims to provide a sufficiently long time to observe the asymptotic behaviour of the model, and is consistent with the time horizon of many of the simulation runs featured in (Epstein, 2002). The empirical interpretation of time steps (whether they would represent hours, days, or months) is not attempted here as it would require appropriate time series data.
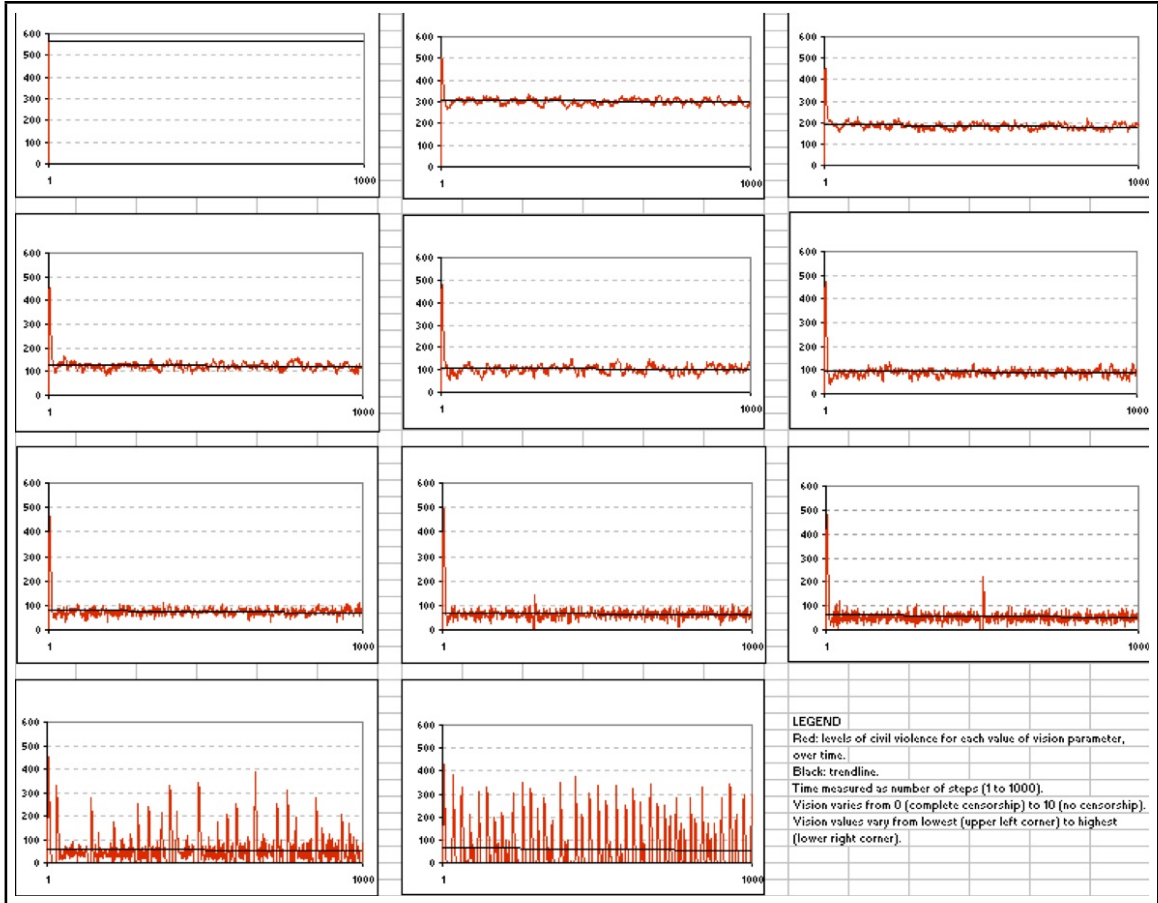
Figure 3: Red patterns represent number of violent protesters over time with different levels of social media censorship: from 0 vision (total censorship, upper left) to 10 vision (no censorship, lower right). Source: authors' elaboration.

vision. All scenarios display an initial outburst, but the subsequent evolution of the overall number of agents engaged in active violent behviour (red line) is influenced by the level of censorship government applies on social media. In the case of total censorship (vision = 0) the level of violence stays at its maximum virtually forever (a scenario reminiscent of the Egyptian situation, where an escalation of protests followed the decision to block Internet access). The other cases correspond to less and less censorship. Values between 1 (almost complete censorship) and 9 (almost no censorship) correspond to different levels of protracted civil unrest: the stronger the censorship, the higher the average level of endemic violence over time (best linear fit represented by the black lines in figure 3).

The last case, corresponding to perfect social agents' vision (and thus to no censorship at all) deserves a little more comment. Apparently this situation is characterised by incessant high-level outbursts of violence, with peak active levels that seem to be even more significant that in other cases. Yet, the average trend of violence over time (black fitting line) remains among the lowest. Moreover, if we want to measure the size of violent outbursts, their peak active level is not a sufficient measure. Looking at time intervals between outbursts, at the duration of outbursts, and at the level of "social peace" between outbursts, helps us discover that this scenario is actually the systemic optimum. In the absence of censorship, agents protest, sometimes violently, nevertheless they are able to return to significant levels of quiet (green line in figure 4), when social unrest is halted.

This is the only scenario where active protest drops down to zero for extended and repeated periods of time (see Table 1 in Appendix A). Although this situaton – in harmony with what Epstein described as "punctuated equilibrium" in his original model of civil violence – does not seem to match a complete and utter (and empirically unlikely) "social peace", it still corresponds to a state where citizens are free to voice their dissent on social media, to coordinate their efforts and act about it – albeit in confrontational ways – while still enjoying a higher level of quiet over time (see figure 5).

In the absence of online censorship, social agents have maximum vision (here, equal to 10). This corresponds to the lowest levels of civil violence over time.
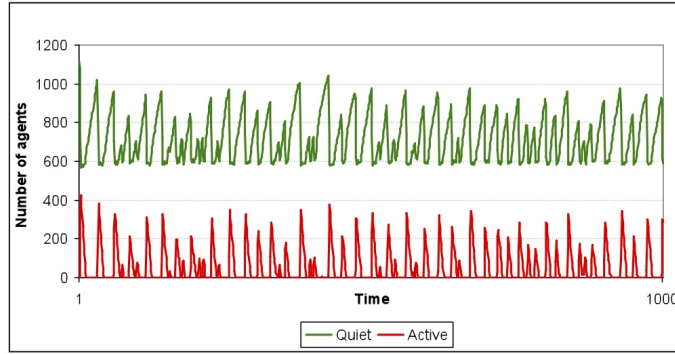
Figure 4: In the absence of censorship, high levels of social unrest are possible (see peaks in red line), but between uprisings, the social system is able to come back to significant levels of quiet (green line). Source: authors' elaboration.
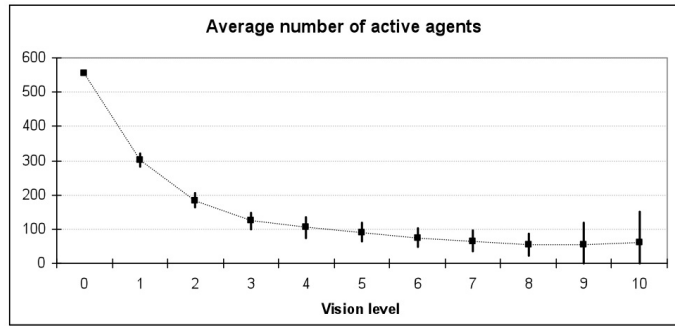

Figure 5: Levels of civil violence over time as function of levels of censorship. Higher vision means less censorship and less civil violence. Source: authors' elaboration.

4 Some concluding remarks

It is not our role to pass judgments on politicians and police officers' disapproval of "sociological justifications" of the UK riots or on their dismissal of social sciences as — at best — a luxury one cannot afford in times of unrests. This shoot-first-ask-later stance, although perhaps moved by the best intentions, might lead to ill-advised policy choices, like in the case of Internet censorship that we have chosen to discuss here.

Of course other factors have to be taken into account to use a civil violence model inspired by Epstein. As shown in a recent paper by Klemens et al. (2010) rebellious outbursts are more likely given increased hardship (the recent financial crisis does seem to come into play here). Civil violence is also influenced by loss of government legitimacy — which in this case seems consistent with the unpopular budget cuts promoted by David Cameron, not to mention the recent Murdoch/News of the World phone hacking scandal. Finally, protest outbursts are less likely given increased repressive capacity. The growing presence of MET police and law enforcement initiatives on Facebook [10], Flickr [11] or Google Groups [12] can actually account for the subsequent limitation of violent outburst by reducing the rioters' communicational advantage.

Other studies have applied social simulation to censorship in situations of civil violence. Garlick and Chli (2009) for example, insist that restricting social communication pacifies rebellious societies, but has the opposite effect on peaceful ones. Our intention is to show that the choice of not restricting social communication turns out to be a judicious one in the absence of robust indicators as to the rebelliousness of a given society.

What we have tried to do is to demonstrate how, even in the absence of empirical data, social sciences can still help us interpret how social factors come into play, and possibly avoid trading democratic values and freedom of expression for an illusory sense of security.

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[10]See URL: http://www.facebook.com/pages/Supporting-the-Met-Police-against-the-London-rioters/152937041453243?sk=wall

[11]See URL: http://www.flickr.com/photos/metropolitanpolice/sets/72157627267892973/

[12]See URL: http://groups.google.com/group/london-riots-facial-recognition

Appendices

A   Tables

Table 1: Time without riots, in percentage, corresponding to different levels of vision

Vision levels	% time spent in quiet (no civil violence)
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0.3
9	10.2
10	32.5

Table 2: Parameters used in the model

Parameters	Values
Initial cop density	4 %
Initial agent density	70 %
Number of cops	64
Number of agents	1120
Government legitimacy	80 %
Max jail term	30 time steps
Vision	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

B   Netlogo code

```
;; SOCIAL MEDIA IN UK RIOTS
breed [agents agent]
breed [cops cop]
globals [
k ; factor for determining arrest probability
threshold ; by how much must G ¿ N to make someone rebel?
]
agents-own [
risk-aversion ; R, fixed for the agent's lifetime, ranging from 0-1 (inclusive)
perceived-hardship ; H, also ranging from 0-1 (inclusive)
active? ; if true, then the agent is actively rebelling
jail-term ; how many turns in jail remain? (if 0, the agent is not in jail)
]
patches-own [
neighborhood ; surrounding patches within the vision radius
]
to setup
clear-all
;; set globals
set k 2.3
set threshold 0.1
ask patches [
;; make background a slightly dark gray
set pcolor gray - 1
;; cache patch neighborhoods
set neighborhood patches in-radius vision
]
;; create cops
create-cops round (initial-cop-density * .01 * count patches) [
move-to one-of patches with [not any? turtles-here]
display-cop
]
;; create agents
create-agents round (initial-agent-density * .01 * count patches) [
move-to one-of patches with [not any? turtles-here]
set heading 0
set risk-aversion random-float 1.0
set perceived-hardship random-float 1.0
set active? false
set jail-term 0
display-agent
]
;; plot initial state of system
update-plots
end
to go
ask turtles [
; Rule M: Move to a random site within your vision
if (breed = agents and jail-term = 0) or breed = cops
[ move ]
; Rule A: Determine if each agent should be active or quiet
if breed = agents and jail-term = 0 [ determine-behavior ]
; Rule C: Cops arrest a random active agent within their radius
if breed = cops [ enforce ]
]
; Jailed agents get their term reduced at the end of each clock tick
ask agents
[ if jail-term ¿ 0 [ set jail-term jail-term - 1 ] ]
; update agent display
ask agents [ display-agent ]
ask cops [ display-cop ]
; advance clock and update plots
tick
update-plots
if ticks = 1000 [stop]
end
;; AGENT AND COP BEHAVIOR
;; This was the original model by U. Wilensky (now inactive)
;; move to an empty patch
;;to move ;; turtle procedure
;;if movement? or (breed = cops) [
;; move to a patch in vision; candidate patches are
;; empty or contain only jailed agents
;; let targets neighborhood with
;; [not any? cops-here and all? agents-here [jail-term ¿ 0]]
;; if any? targets [ move-to one-of targets ]
;; ]
;; end
;; These are the modifications introduced by A. Casilli and P. Tubaro on 10 August 2011
to move ;; turtle procedure
```

```
;; for cops only: it is just the same as before
ifelse breed = cops [
;; move to a patch in vision; candidate patches are
;; empty or contain only jailed agents
let targets neighborhood with
[not any? cops-here and all? agents-here [jail-term ¿ 0]]
if any? targets [ move-to one-of targets ]
]
;; for agents: this has been changed
;; this introduces an asymmetry that provides an additional advantage for agents
[if movement? [
;; move to a patch in vision
;; candidate patches are empty or contain only jailed agents and
;; they choose among them those with highest number of active agents around
let targets neighborhood with
[not any? cops-here and all? agents-here [jail-term ¿ 0]]
if any? targets [
move-to max-one-of targets [count (agents-on neighborhood) with [active?]]
]]]
end
;; AGENT BEHAVIOR
to determine-behavior
set active? (grievance - risk-aversion * estimated-arrest-probability ¿ threshold)
end
to-report grievance
report perceived-hardship * (1 - government-legitimacy)
end
to-report estimated-arrest-probability
let C count cops-on neighborhood
let A 1 + count (agents-on neighborhood) with [active?]
;; See Information tab for a discussion of the following formula
report 1 - exp (- k * floor (C / A))
end
;; COP BEHAVIOR
to enforce
if any? (agents-on neighborhood) with [active?] [
;; arrest suspect
let suspect one-of (agents-on neighborhood) with [active?]
ask suspect [
set active? false
set jail-term random max-jail-term
]
move-to suspect ;; move to patch of the jailed agent
]
end
;; VISUALIZATION OF AGENTS AND COPS
to display-agent ;; agent procedure
ifelse visualization = "2D"
[ display-agent-2D ]
[ display-agent-3D ]
end
to display-agent-2D ;; agent procedure
set shape "circle"
ifelse active?
[ set color red ]
[ ifelse jail-term ¿ 0
[ set color black + 3 ]
[ set color scale-color green grievance 1.5 -0.5 ] ]
end
to display-agent-3D ;; agent procedure
set color scale-color green grievance 1.5 -0.5
ifelse active?
[ set shape "person active" ]
[ ifelse jail-term ¿ 0
[ set shape "person jailed" ]
[ set shape "person quiet" ] ]
end
to display-cop
set color cyan
ifelse visualization = "2D"
[ set shape "triangle" ]
[ set shape "person soldier" ]
end
;; PLOTTING
to update-plots
let active-count count agents with [active?]
let jailed-count count agents with [jail-term ¿ 0]
set-current-plot "Active agents"
plot active-count
set-current-plot "All agent types"
set-current-plot-pen "active"
plot active-count
set-current-plot-pen "jailed"
plot jailed-count
```

```
set-current-plot-pen "quiet"
plot count agents - active-count - jailed-count
end
```

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