# "Death to . . . !": On Opinion Dynamics in Conflict-Torn Afghanistan

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**Abstract.** Crowds and riots in contemporary conflict are only little understood. However, it is fairly well understood that the emergence of crowds and riots in conflict regions has a severe and lasting impact on the security situation. On the basis of an existing and cross-validated model of Afghan power structures we demonstrate what role opinion dynamics play in the evolution of a critical social condition preceding the emergence of crowds and riots. It is explained how information on security incidences spreads within an artificial society and when such a turning point is reached. The influence of network structures on the spread of information and the role opinion leaders play is explored. We find that small world network structures lead to dynamics that are volatile, unpredictable and performative in nature. It is also shown that opinion leaders have a catalytic effect on the information distribution processes. These findings bear importance for policy makers and practitioners in the field.

**Keywords.** Afghanistan, contemporary conflict, crowds and riots, evidence-driven social simulation, opinion dynamics.

## 1 Introduction

In post-conflict situations the transition from a calm crowd, a gathering of individuals meeting the requirement of spatial and temporal co-presence, into a crowd acting aggressively and violently, i.e. a riot, plays a crucial role. A US military convoy, for example, caused an accident in Kabul in 2006, which left fourteen people dead and sparked off violent anti-American riots. Contemporary conflict is a complex phenomenon [2,4,5] and crowd behaviour is a complex and dynamic phenomenon itself, where a multitude of factors influence individual behaviour within a crowd. These multi-layered and highly dynamic group processes render diagnosis difficult when and under what conditions calm crowds turn into riots. Moreover, riots often tip due to situational mis-conceptions [16]. In contemporary conflict regions crowds and riots put at stake peace- and reconstruction processes. They also have significant impact on foreign investments, a government's and the security situation's stability. Hence, acquiring knowledge and understanding of mechanisms and processes that occur within a crowd – that eventually turns into a riot – and therefore of the factors that influence (intra-)individual and collective behaviour is important.

Crowd research has advanced in the last 15 years and numerous observational studies have been published [12]. These studies had a major impact by falsifying dominant intuitive crowd theories by empirical evidence. The main insight is that crowd and riot behaviour is part of a more general human behaviour that takes place on the individual level and which is situationally driven. Although recent research provides a good foundation to proceed from, theory development is limited due to methodological and security constraints imposed by experimental research designs.

The research at hand steps into this lacuna by making use of agent-based social simulation (ABSS). It is the virtue of ABSS to analyse complex social phenomena [15]. Moreover, ABSS allows to conduct (computational) experiments, the results of which can be statistically and qualitatively analysed on multiple levels. Methodologically speaking, this constitutes an important complementary contribution to existing crowd and riot research.

This research scrutinises the dissemination of information about critical incidences in conflict-torn Afghanistan. Such opinion dynamics stand at the bottom of crowd and riot formation and therefore play a pivotal role in the evolution of a critical condition in Afghan society from which a riot can emerge. The more people know about an incidence that has the potential to raise tensions between the local population and foreign and government actors the higher is the likelihood that clusters of consensus evolve which serve as a critical pre-condition for a crowd and riot build-up (i.e. protests, demonstrations, etc.).

The domain of opinion dynamics is quite broad. Some approaches focus on the formalisation of opinion as continuous (a real value) [7,1] or binary [11], other approaches analyse influences stemming from the social group on the individual based on for instance social judgement theory [8] or self-categorisation theory [17]. However, they all focus on the change of opinion and attitude as an intra-group process. Although we adopt the view of non-linearity and acknowledge the important role of the social environment, we mainly – and rather innovatively – concentrate on the effect opinion dominance has and the role social network structure in terms of distinct power relations play with regard to the dissemination of information as a prerequisite to the emergence of crowds and riots. By analysing the spread of information within a cross-validated model of Afghan power structures [5] we explain when, how and why such a critical condition arises. We also explore the role opinion leaders play in and how network structures influence opinion dynamics.

## 2 Crowds and Riots: Theoretical and Modelling Issues

Human crowd behaviour is a multi-layered and -causal, complex and dynamic phenomenon, in which the interplay between individuals and their environment, and vice versa, give rise to a constellation we call a crowd or a riot. Modelling affords to identify the relevant factors of influence and to concretely theorise about underlying mechanisms and processes. These influences originate from the external (physical and social) as well as the internal (physiological and functional) world [18,20]. Even though the sources of these influences are multi-level in nature, it is the individual level on which they have an effect (see Fig. 1). ABSS' inherent cognation with the notion of emergence, where the individual level gives rise to phenomena on the collective level and the latter influences behaviour on the former, affords us gaining an understanding of crowds behaviour on the individual and group level. Only a few studies in the field of social simulation, however, focus on crowd and riot behaviour's underlying mechanisms and dynamics [9,2,14]. Those who do demonstrate the conceptual explanatory power of linking properties on the individual level to behavioural patterns on the group level – and vice versa – via individuals' interactions in a crowd. We particularly concentrate on the evolution of a critical condition preceding the emergence of crowds and riots and the role of particular social dynamics, i.e. opinion dynamics (cf. [9]).

By modelling the dissemination of information between individual agents in an artificial society we describe the mechanisms and processes which we expect to be important to explain the prerequisites of the evolution of a critical condition antecedenting the emergence of crowds and riots. The notions of saliency and social situatedness are important for our model. Saliency implies that whatever is dominant in the cognitive system is more likely to affect behaviour (see below). For instance, this concept is used to explain normative behaviour or to explain individual behaviour in groups [10]. Additionally we assume social situatedness, i.e. social influences, to play a crucial role in the rise of the behavioural patterns observable, and thus in the opinion polarisation preceding riots [6]. From a modelling perspective it can be therefore stated that, as the dynamics between individuals and their environment give rise to human-like behaviour, it is a matter of identifying the critical influences and internal mechanisms and components in order to computationally produce the desired outcome.

## 3 Modelling Afghan Opinion Dynamics

In this section a conceptual model of Afghan opinion dynamics is discussed, three idiographic, but nevertheless representative cases which recently occurred in Afghanistan are presented for reasons of circumstantial evidence, and the computational model is introduced.

### 3.1 A Conceptual Model of Afghan Opinion Dynamics

Having an opinion is modelled to affect behaviour and thereby play a role in a potential future riot. In order to influence behaviour, an opinion firstly needs to be dominant, whereas the content of the opinion itself steers the direction of influence. The precondition of opinion dominance relates to the idea that only the dominant elements in our cognitive system affect behaviour (saliency). External stimuli, such as incidents and communication with others (social influence) affect the dominance of related opinion. Evidence shows that an externally induced stimulus, such as perceived inapt or reckless behaviour by foreign military forces, can radicalise group opinions (see examples below). Whereas the communication with other individuals is determined by the social network one is embedded in.

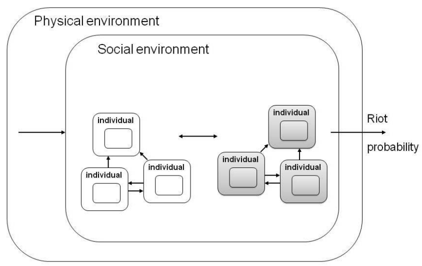


**Fig. 1.** A schematic representation of multi-variate and -level influences of individual and crowd behaviour.

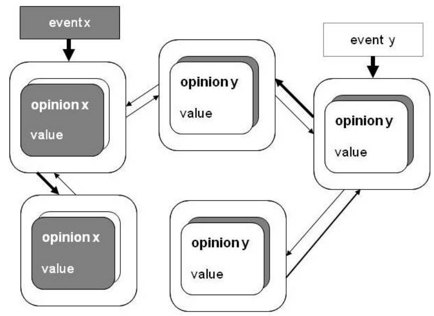


**Fig. 2.** How a dominant opinion affects individuals in a given situation incorporating incidents and social structure.

Where the dominance of an opinion is simply related to the present context of events or communication, changing an opinion involves a more complex relation. Changing an opinion is related to social influence. Social influence hereby depends on other agents' vicinity as well as the type of relationships an individual has with those other individuals. Here we discern two types of influences, power and majority effects. As people tend to be obedient in power relations they also exhibit a tendency to acquire the opinion of a more powerful person [13]. Changing an opinion as a result of a majority-function is, by contrast, a result of normative pressure of or agreement with a majority [3]. In either case an opinion and thus behaviour is affected. Altogether context steers what and how behaviour is affected by making opinion dominant or change its content (see Fig. 2).

### 3.2 The Case: Opinion Dynamics, Crowds and Riots in Afghanistan

A variety of incidences can trigger the emergence of crowds that eventually evolve into riots in Afghanistan. Most of these incidences fall into one of the following three categories: i) Security incidences, such as reckless behaviour of foreign military forces or collateral damage; ii) Political incidences, such as external influence of foreign governments, e.g. Iran, Pakistan, Saudi Arabia or the United States; Socio-cultural issues (values), such as prostitution, alcohol or religious issues. A representative example for each category shall be briefly presented.

i) On 29 May 2006 an American convoy driving from Bagram airbase to Kabul City caused a deadly traffic accident.[3] In an attempt to disperse the protesting

[3] Carlotta Gall, "Anti-U.S. Rioting Erupts In Kabul; At Least 14 Dead", *New York Times*, 29 May 2006.

crowd, U.S. soldiers opened fire. Anti-American riots swiftly touched off in the capital, leaving at least 14 people dead at the end of the day and forcing the city officials, in fear of further social unrest, to announce a curfew.

ii) On 16 May 2007 approximately 1000 Afghans demonstrated in front of the Pakistani embassy in Kabul and shouted "Death to Pakistan".[4] Afghan police was on the spot, wearing riot gear. The demonstration, however, did not escalate into a violent riot. Many of the demonstrators were from Paktia, an Afghan province bordering Pakistan and where fighting between Afghan and Pakistani troops killed at least 13 Afghan border guards and civilians in the same week. One demonstrator said that they ran out of patience with Hamid Karzai, Afghanistan's president. The same source said that they have made a request to Hamid Karzai to equip them with weapons in order that they are able to deal with Pakistan themselves. Slogans like "Death to the ISI" and "Death to Musharraf", a Pakistani president, made it clear that the demonstrators criticised the Afghan government of bowing, at the least, toward their eastern neighbour.

iii) On 21 March 2008, thousands of Afghans demonstrated in the city of Kabul against the re-publication of Prophet Mohammed drawings in Denmark.[5] The protesters sloganed "Down with Denmark" and "Death to America" and burned Dutch and Danish flags as well as an effigy of the Dutch filmmaker and politician Geert Wilders, who is the director of a film titled "Fitna", in which the Koran is described as a fascist book. There is no evidence that the gathering of protesters developed into a violent protest and riot. However, comparable protests have sporadically sprung across the country in the early months of 2008 with protesters demanding Danish and Dutch troops to be withdrawn from Afghanistan and their embassies shut down. The U.S. Army in Afghanistan takes these incidences very serious.

What is common to all of these accounts is that they are caused by an external effect. The questions to be addressed in the model are how the information of such an external effect percolates through Afghan society, how clusters of opinion emerge and when a threshold is reached that eventually could lead to riots.

### 3.3 The Model

The model at hand simulates the spread of information through a network, triggered by the occurrence of an external event. Whenever an event occurs, it is witnessed by an agent who then transmits the information through his social network. The network an individual is embedded in is subject to changes, due to the preference and role of individuals. In doing so, we extend an existing evidence-based and cross-validated model of Afghan power structures [5] by incorporating incidents and a related opinion to be shared by the agents.

[4] Amir Shah, *Associated Press*, 16 May 2007.

[5] *Associated Press* statement, *International Herald Tribune*, 22 March 2008; Ahmad Masood, "Afghans chant death to Danish and Dutch in protest", *Reuters*, 21 March 2008; Shaun Waterman, "U.S. military cuts critique of Dutch Islam film", UPI.

The underlying Afghan power structure model describes the evolution of a social network, in which individuals choose their relations based on a motivation to accumulate and re-distribute material and social resources. However, individuals' choices are constraint by such factors as religion, ethnicity, kinship, space, information and money. An agent's cognition is modelled in terms of so called endorsements, a description of an agent's cognitive trajectories, aimed at achieving information and preferential clarity over another agent from a subjective perspective [19]. The unique personal attributes each agent exhibits, e.g. religion, ethnicity, etc., makes other agents more preferable for affiliations or patron-client relationships than others. Hence, agents (so called endorsers) tend to prefer to endorse those agents (so called endorsees) which meet their expectations more closely (cf. saliency above). In sum, the original AfghanModel represents individual interaction processes that are motivated by personal, i.e. subjective preferences and that give raise to emerging social networks, so called *qawm*. *Qawm* are non-exclusive solidarity networks prevalent in Afghan society. They provide identity and therefore also social context (cf. situatedness above). The reason it is suitable to build the current model upon an existing model of Afghan power structures is that the latter represents fundamental interaction processes and structures of Afghan society. It is very plausible to assume that information spreads through these *qawm*.

The original AfghanModel is extended insofar as agents are given the ability to experience an event and to share this information with other agents. In doing so we add a layer of influence to the existing Afghan power structures model. The original model of an individual agent is mainly involved in how an internal state affects behaviour (endorsements). Now an individual's internal state can also be affected by endogenous influences, i.e. incidences. *In concreto*, if an event occurs or agents in a social network "talk" about an event, this is internally represented as an opinion (information) related to a given event. Consequently, this information is shared with people in a specific agent's network. In simulating this process the information about an event that has occurred randomly transgresses through a *qawm* and therefore through an (artificial) Afghan society.

## 4 Simulation Results

Once a random incidence has been witnessed by a randomly chosen agent, the witness passes this information on to those agents he has endorsed. Let us consider a single, representative simulation run where an incidence has occurred at time step (tick) 83. The incidence's witness is warrior-17. Warrior-17 informs all of his endorsees in the same tick, i.e. warrior-18 and civilian-7. These agents inform their endorsees in the next tick (tick 84). Because only warrior-18 is also an endorser, it is only him who passes the information on, in this case to warrior-0. Warrior-0 is rather well connected, as he passes the information on to: drug-farmer-13, politician-4, religious-leader-0, civilian-20, civilian-8. A cascading dissemination of the information unfolds now and the following agents are informed about the incidence in tick 86: politician-0*, commander-2*, religious-leader-

0*†, politician-4†, civilian-31*, civilian-54*, drug-farmer-4*, civilian-51, warrior-19*, commander-0*, civilian-8*†, civilian-3, civilian-11, civilian-7*†, civilian-0, civilian-2, civilian-14, civilian-12, civilian-20†, civilian-34, civilian-40*, civilian-64, civilian-57, drug-farmer-10, drug-farmer-13*†, drug-farmer-26*, drug-farmer-34, warrior-1, warrior-12, warrior-17†, warrior-18†, organised-criminal-3* and drug-dealer-7.[6] In tick 83 only 3 agents (the witness inclusive) know about the incidence. In tick 84 4 agents know about it. In tick 85 a total of 9 agents know about the incidence. Suddenly, in tick 86 an additional 26 agents know about the incidence, which brings the total of informed agents to 35. This is almost a four times increase in the population that is now informed. To achieve this state, a total of 67 messages has been sent around.

Unsurprisingly, the information now keeps on percolating through the network, reaching its performative peak in tick 90, where 52 new agents become informed about the incidence. However, the information's spread reaches its peak one tick later, i.e. in tick 91, where of course all the newly informed agents pass their newly gained information on to their endorsees. From tick 91 onwards the dissemination's pace starts to decrease. Only 9 agents are newly informed in tick 91 and in tick 92 only 83 messages are passed around, which, however, do not reach any uninformed agents. In tick 93 4 further messages are distributed, which, again, do not reach any uniformed agents. In tick 94 the dissemination comes to a halt as all agents in the network (N = 173) have been informed about the incidence. A total of 1790 messages has been sent around. The plots in Figure 3 depict this development with regard to the absolute number of informed agents per tick and messages sent per tick.

An important question we are raising in this paper is the possibility to define a turning point that is tantamount to the evolution of a critical condition. Such a turning point would indicate that the mental state in the society is of such nature that crowds and riots are likely to occur. Figure 3 suggests two possible turning points, namely the two peaks with regard to sent messages at ticks 5 and 9. However, looking at the number of informed agents per tick, the turning point is more likely to be situated at tick 8. Another possibility to define a turning point could be based on the moment when a particular ratio of the population is informed about an incidence, for example 50%. Then the turning point would be at tick 6. Hence, for the time being a turning point cannot be unambiguously determined. We will return to this question below.

Aggregate statistics allow for a more holistic analysis. The spline curve in Figure 4 depicts the average number of messages sent over 10 representative simulation runs. The error bars indicate the standard deviation ($\sigma = 1$). After an incidence

[6] Agents marked with * have been informed twice or more times in the same tick by different agents. Agents marked with † have been already informed in the previous step. Note that agents cannot pass information back and forth between each other. However, there exist triadic relationships amongst agents. Imagine agent A endorsing agent B and C, agent B endorsing C, and C endorsing A. If A receives an information, then he passes it on to B and C. Because B endorses C, he passes the information on to C as well. And because C also endorses A, he passes the information received by B on to A.

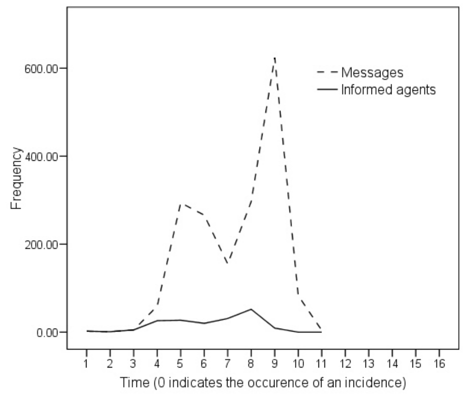


**Fig. 3.** The absolute number of messages passed per tick and the absolute number of newly informed agents per tick in one representative simulation run.

has occurred, the spread of information, measured as numbers of messages sent, slowly increases until tick 3. Thereafter its pace suddenly starts to increase, reaching its climax at tick 6, from where it starts to decrease until it reaches almost 0 at tick 11. These dynamics confirm our afore interpretation that the information spreads according to a cascading fashion. The error bars in Figure 5 also confirm our hypotheses that the generated opinion dynamics are highly volatile, especially for the period between ticks 6 and 9. We note that that the highest volatility is reached during a cooling off phase. This makes the system highly unpredictable.

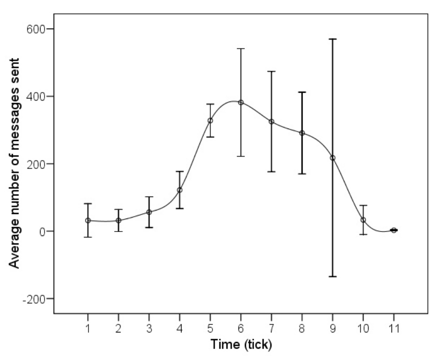


**Fig. 4.** Average number of messages sent per tick over ten representative simulation runs. Error bars denote one standard deviation ($\sigma = 1$).

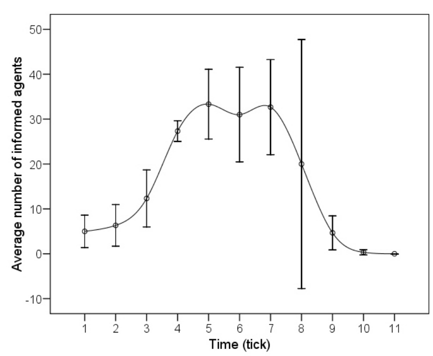


**Fig. 5.** Average number of informed agents per tick over ten representative simulation runs. Error bars denote one standard deviation ($\sigma = 1$)

The spline curve in Figure 5 depicts the average number of informed agents per tick. The error bars denote the standard deviation ($\sigma = 1$). As in Figure 4 it takes a while until the society actually becomes informed. Figure 5 shows that this take off happens after tick 2, which is 1 tick earlier than in Figure 4. The (twin-)peak is reached at ticks 5 and 7 respectively where 33.3 and 32.7 agents respectively are newly informed. Figure 5 unsurprisingly indicates that the actual information of agents is time lagged compared to the distribution of information (i.e. messages). What is, however, counterintuitive is that although the dissemination of information measured in numbers of messages sent per tick decreases after tick 6 the number of newly informed agents rests on a high level until tick 7. Hence, the impact the spread of information has on the virtual society is a lot longer time-wise than the spread of information itself. The error bars, again, suggest a high volatility in the system, particularly after tick 4.
Figure 6 depicts the cumulative frequencies for informed agents for 10 representative simulation runs. The abscissa denotes the number of time steps while the ordinate denotes the cumulative frequencies of informed agents relative to the total number of the population. Solid lines denote cases where the witness was a non-elite agent while dashed lines denote cases where the witness was an elite agent. The horizontal line denotes the 0.5 frequency level, i.e. the level where 50% of the population have been informed. The 0.5 level could be also defined as the turning point, as already discussed above. Although it appears that the first half of the population is more quickly informed than the second half, no obvious conclusion can be drawn from the simulation results with regard to the evolution of a critical condition. However, it becomes now clear that in the end the whole population is informed about the incidence. This happens in a very short time, namely in the cases at hand within 5 to 13 ticks.

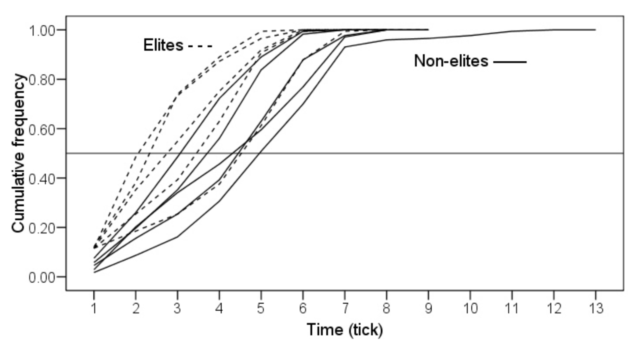


**Fig. 6.** Cumulative frequencies of informed agents for 10 representative simulation runs. The horizontal line indicates the 0.5 level.

Whereas it is for the time being not feasible to derive any unambiguous conclusions from the data with regard to the evolution of a critical condition, the plots in Figure 6 indicate that it indeed makes a difference who is witnessing an incidence. The dashed plots lie farther to the left than the solid lines. This suggests that if elite agents, or opinion leaders, are witnessing an incidence, the information about this incidence spreads faster through the artificial population than if a non-elite agent is witnessing an incidence. Hence, although the emerging networks are small world in nature [5], it appears that the elite-agents are even better connected, i.e. placed in hubs, within that small world network. It therefore also makes a difference with regard to the evolution of a critical condition, it can be inferred, whether an elite agent is witnessing an incidence or an non-elite agent.

## 5 Conclusions

Our findings based on the simulation results highlight a number of important issues with regard to opinion dynamics in an artificial society, the basic structures of which can also be found in Afghan society. We find that the spread of information is fast and performative once an incidence has occurred. The distribution dynamics can be best described as cascading, where it is enough to inform one agent of an incidence in order to inform the whole population after a short time. We are not aware of a case where at the end of the distribution process not the whole artificial society has been informed about the incidence. Hence, the performative capacity of the AfghanModel society is highly efficient, although, and this is highly counterintuitive, Afghan society is a segregated society, also within our model.[7]

It becomes also clear from the simulation results that the developing opinion dynamics are highly volatile and therefore hard to predict. It is in particular unclear if a distribution process has settled down or if one has to expect another acceleration of the spread of information. It became also evident that the first half of the population is informed in less time then the second half. Moreover, the simulations demonstrated that this state is reached more quickly when the witness of an incidence is an elite agent. However, the simulation results are less conclusive with regard to the evolution of a critical condition.

What are the implications of our results? First, it becomes clear that each incidence constitutes a clear and present danger for the security situation in Afghanistan. Once an incidence has occurred there exists almost no possibility to control the flow of information. The policy implication of this is that such incidences must be avoided at all price. Second, there is not much time to prepare for countermeasures should an incidence, however, occur. Hence, the Afghan government and local foreign actors have created anti-riot forces, which are, however, often late. Third, the role elite actors play in the distribution of information must be taken into account when incidences occur. This has happened a number of times in Afghanistan where elite actors have called for sober-mindedness.[8]

[7] Obviously we do not assume perfect information for the Afghan society.

[8] The role of elites in the deliberate, i.e. planned organisation of violence has not been an issue and neither habitual rioting or semi-permanent xenophobia.

These implications bear importance for practitioners in the field. In dealing with crowds, the task for intervening forces is very difficult as they are expected to respond proportionally to a given situation. Every response deemed to be unproportional by the local population must be considered as another incidence, potentially leading to a cascade of events on top of the cascading dissemination of information. However, the lack of systematic knowledge about crowd and riot behaviour and its underlying mechanisms and processes prevents professionals in practice to improve crowd and riot management on the basis of present-day scientific knowledge.

From a more general perspective in can be stated that the extended model at hand not only adds up to the validation of the original AfghanModel by producing data that can be cross-validated with real world data (although in this case only circumstantially). It also underlines that understanding Afghan power structures – and power structures of conflict-torn societies in general – is a prerequisite to understand the Afghan conflict – and conflict in general – better.

However, a number of crucial issues remain unclear and call for further analysis, the most pressing of which is the identification of a turning point. This cannot only be scrutinised my means of social simulation, but must be accompanied by qualitative evidence. Because crowd behaviour arises from the interaction of an individual with his/her (social and physical) environment and because this interaction is the key influence factor of the behaviour analysed, it is necessary, in order to relate observable behaviour to the interaction process, to include also the study of cognitive processes. Consequentially, the actual evolution of crowds and riots has not been addressed in this paper. Neither has it been addressed whether it makes a difference if the artificial society is bigger populationwise.

A better understanding of the intra- and extra-organisational mechanisms that lead to the emergence of crowds and riots also leads to a better understanding of social conflict – an inherent phenomenon of which crowds and riots are. The study of crowds and riots is therefore necessary, although not sufficient, for the analysis of social conflict in general. Agent-based social simulation can significantly contribute to this field of research.

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