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Conceptual Model for Crowd Behaviour

Anissa Frini, Ph.D

DRDC CORA

Defence R&D
Canada

R et D pour la défense
Canada

Canadä

Overview of the project

- ## Aim

  The "Crowd Control Modelling and Simulation Capability" project aim to develop a crowd control simulation capability, to reach two main objectives:

  - To make available a platform that can be used to assess the effectiveness of various types of NLWs in situations of crowd control.

  - To provide the most recent and reliable data on human behaviour in urban conflict situations.

Overview of the project

- ## Motivation

  - Future operations are expected to occur more often in urban environments involving a mix of military and civilian personnel (three block war context).

  - Significantly fewer studies have been done in a military context to simulate the interaction between military forces and civilian crowds.

  - There is a wide recognition of the need to better understand the psychological aspects of crowd behaviour, as well as of the need to integrate such aspects into these simulations.

Overview of the project

- ## Modeling approaches

  - ➢ The agent based modeling technique: the designer starts by defining behaviour at the individual level; the global behaviour of the system emerges from the interaction between individuals.

  - ➢ The system dynamics modeling technique: the designer takes an aggregate view of the system, a step of abstraction above single events or individuals; the global behaviour of the system is described as a set of interacting feedback loops.

Overview of the project

- ## Objective of this presentation

  - ➢ To better understand crowds and crowd behaviour through the main results of literature review.

  - ➢ To identify the main factors (sociological, psychological, physiological, and perceptual) having an impact on crowd behaviour in general and on crowd violence in particular.

  - ➢ To represent a conceptual model explaining the behaviour of an individual within a crowd.

Definitions

- Crowd is "any relatively large number of occupants gathered in a setting at a particular point in time" (Sime, 1999).

- Riot is an offence against the ordinary social order committed by three or more people and including the use of violence. (Lachman, 1996)

  - Riots involve destruction of property, forcible entry into buildings or other property, looting, and assault including physical injury and even murder.

Definitions

- Categories of behaviours

  - Peaceful: e.g. wandering, marching, chanting, hanging out/watching.

  - Non aggressive: e.g. standing on elevated structures, flag waving.

  - Aggressive posture: e.g. burning tires, building barricades, taunting/yelling, rising firearms.

  - Aggressive: e.g. throwing rocks and projectiles, pushing/shoving, fighting, shooting, firing, throwing Molotov cocktails.

- What make aggressive/violent behaviours occur? What are the indicators of crowd violence?

Main results of the literature review: Indicators of crowd violence

- **Psychological state (Lachman, 1996, Reece, 2002, Vider, 2004)**

  - Aggression is a primitive reaction to frustration.

  - Emotional excitement could lead to riot. Excitement could be either the results of fear and anger or the results of joy and having fun.

  - Fear reduces interest toward performing "mission" tasks and increases the desire to perform self-preservation tasks.

  - Panic is highly contagious and cause people to become unreasoned and irrational so that their actions endanger themselves and others.

  - High level of hostility encourage confrontation with antagonists.

Main results of the literature review: Indicators of crowd violence

- **Demographical aspects:** Gender, age, unemployment rate, lower-class standing, poverty and social injustices, ethnic diversity.

  o Siann, 1985; Gaskins et al., 2004, DiPasquale and Glaeser, 1998; Kaplowitz and Campo, 2004; Mustonen et al., 1996; Pate, 1994; Pene, 1994; Ward, 1994; Favre, (1990).

- **Composition and objective of the crowd:** Presence of instigators, experience of participants, size of the crowd, overcrowding, feeling of anonymity

  o Gaskins et al., 2004; .Filleule, 1993; Gaskins et al., 2004; Favre, 1990; Vogelman, 1995).

- **Culture:** Acceptability of violence, history, stereotypes, norms, standards.

  o (Reicher et al., 2004)

Main results of the literature review: Indicators of crowd violence

- **Environment:** Temperatures, time of the day, location.

  o Berkowitz, 1972; Kenny et al., 2001; Vogelman, 1995, lachance, 2003.

- **Interaction with out-groups:**

  ➢ Perception of the actions of the control forces as illegitimate (Reicher, 2004; Stott et al., 2001).

  ➢ Perception of the aggressive actions of the neighbours as legitimate.

- **Others:** Alcohol and drugs, noise, music, weapons and equipment within crowd, rumours and counter-rumours, media promotion.

  o Vogelmann, 1995; Gaskins et al., 2004; Broadbent, 1979; Cornwell et al., 2002; Apter, 1992; Gowensmith and Bloom, 1997; Kenny et al., 2001; Meyers, 2000.

Main results of the literature review: Theories of crowd

Theories of crowd	
Le Bon (1895), Park (1904), Blumer (1939)	Le Bon's Theory. Crowds are mass of individuals literally loosing their mind and abandoning their own personality to make way for a collective mind. Crowd participants were given to spontaneity, irrationality, loss of self control and a sense of anonymity.
Allport (1924)	Individualistic Theory. Crowd events can be understood in terms of the convergence of similar individuals, usually of a particular type of personality. This theory explains violent actions performed by well-known violent groups but does not explain violent actions performed by ordinary people.
Berk (1974)	Game Theory. Collective behaviour is highly rational: the behaviour of a looting rioter is explained in terms of a calculus of gains versus losses.
Turner & Killian (1972)	Emergent Norm Theory. Crowd behaviour should be understood as rule-governed and controlled rather than 'instinctual'. Norms are developed through interaction.

Main results of the literature review: Theories of crowd

Theories of crowd	
Turner (1982)	Self Categorisation Theory. During the event, there is a shift from personal to social identity and the emergence of cultural standards as a basis for behavioural control. Collective behaviour is explained in terms of participants sharing a common identity or self-categorization.
Reicher (1984, 1987)	Social Identity Model. Commonality is due to participants sharing a common social identity (rather than contagion or social facilitation). This common identity specifies what counts as normative conduct.
Reicher (2001), Stott and Drury, (1999, 2000)	Elaborated Social Identity Model. A shift of social identity could happen during the event. When the police action is perceived as illegitimate and indiscriminate, the prior social identity of crowd participants could change from peaceful to conflictual. The psychological change occur along at least four dimensions: identity, empowerment, definitions of legitimate conduct and identity boundaries.

Assumptions

- In this work, we assume that:

  - Crowds are not homogeneous entity, all participants are not the same and not unanimous in their motivation.

  - The individual within a crowd is neither completely rational nor completely irrational.

    - In the majority of cases, the individual within a crowd is rational. He/she behaves according to social norms and standards, developed through interaction.

    - But, it happens that the individual loses self-control and starts imitating behaviours of neighbours without thinking.

Assumptions

- In this work, we assume that:

  - During the event, a social identity is formed through interaction with the crowd. The individual control its behaviours according to the emerged social norms/standards.

  - A shift of social identity (from peaceful to conflictual) could happen if:
    - The police actions is perceived as illegitimate;
    - The aggressive behaviour of neighbours is perceived as legitimate;

  - An unconscious shift in social identity could happen if the number of neighbours performing the same behaviour exceeds an individual threshold of acceptance of the behaviour.

  - Imitation doesn't result from a rational decision-making process. It results from an unconscious shift in social identity.

# Triandis (1979): A model for individual behaviour
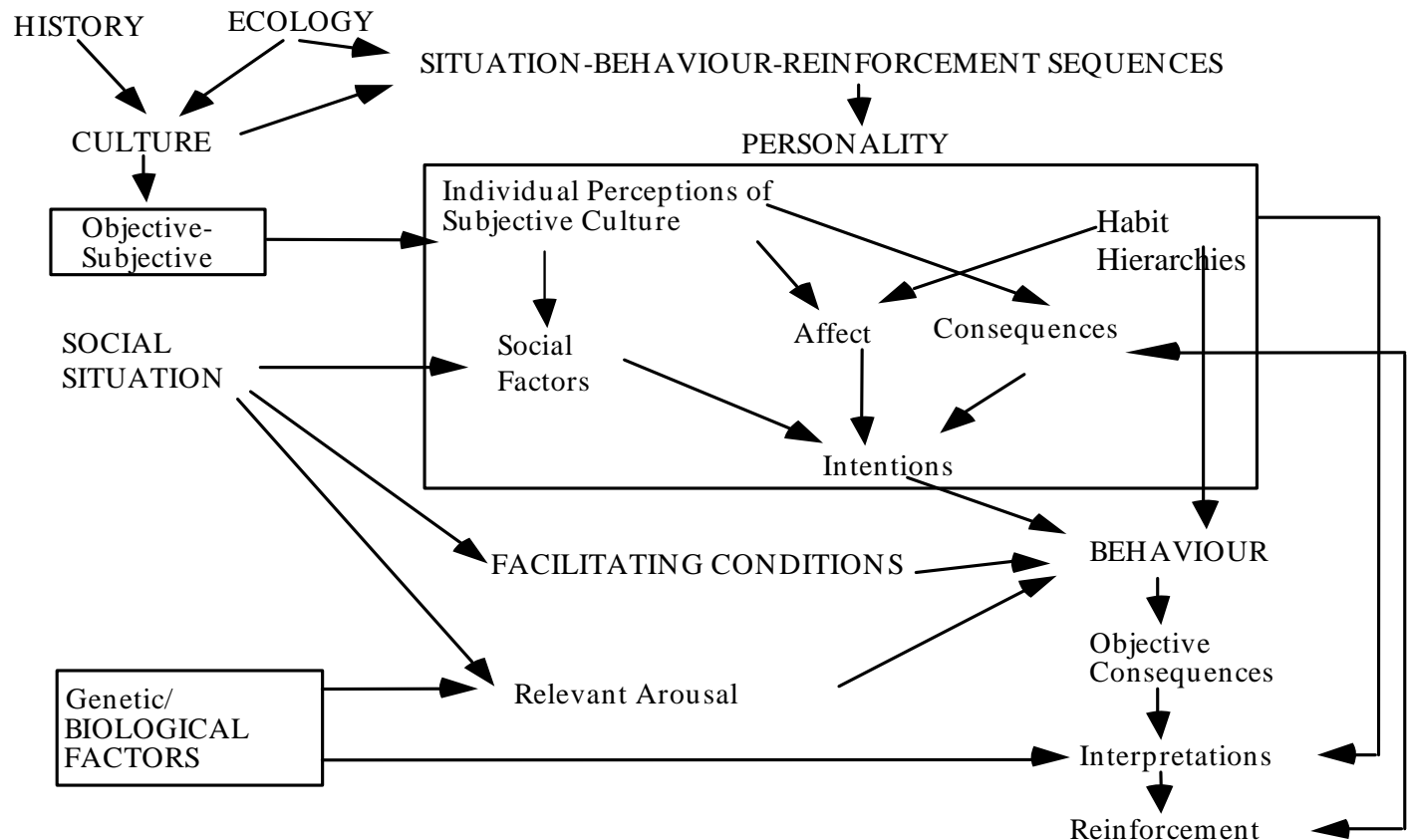
- This model explains the behaviour of an individual in everyday life.
- But, how to explain the behaviour of an individual in crowd situation?

How crowd behaviour could be explained?

- ## Emotional State

  - ➢ Emotions (e.g. frustration, fear, panic, hostility) have the most direct influence on behaviour. They guide decisions, influence reactions to situations and determine how individual feel. In the crowd, emotions vary among individuals and change rapidly depending on the perceived threats.

  - ➢ Examples:
    - – Aggressive behaviour is a primitive reaction to frustration,
    - – Irrational behaviours appear after a state of panic,
   - – Confrontational behaviours appear as a reaction to hostility

Emotional state	→	Behaviour
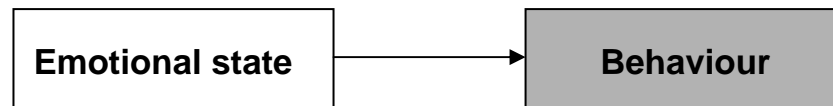
How crowd behaviour could be explained?

- **Social Identity**

  ➤ The individual perform behaviours which fit with his/her social identity.

 ➤ The emergent social norms (beliefs and standards) has an impact on social identity.

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┌─────────────────────┐              ┌─────────────────────┐
│  Emotional state    │─────────────▶│     Behaviour       │
└─────────────────────┘              └─────────────────────┘
                                                ▲
                                                │
┌─────────────────────┐                         │
│  Social identity    │─────────────────────────┘
└─────────────────────┘
         ▲
         │
Emergent
social norms
```
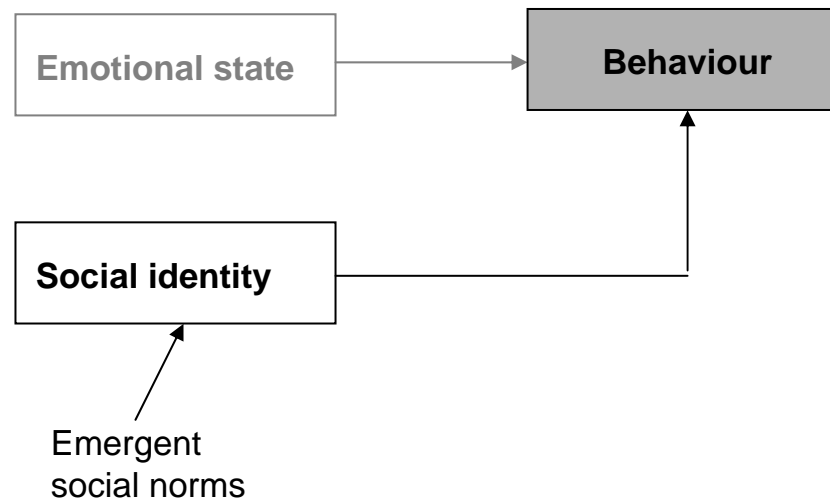
How crowd behaviour could be explained?

- **Facilitating factors**

  - ➢ Feeling of anonymity (related to size of the crowd and density)

  - ➢ Feeling of invulnerability

  - ➢ Loss of responsibility

  - ➢ Weapons, equipments

  - ➢ Alcohol, drugs

  - ➢ Physiological needs (impeding factor)

Facilitating factors → **Behaviour**

Emotional state → **Behaviour**

Social identity → **Behaviour**

Emergent social norms → **Social identity**
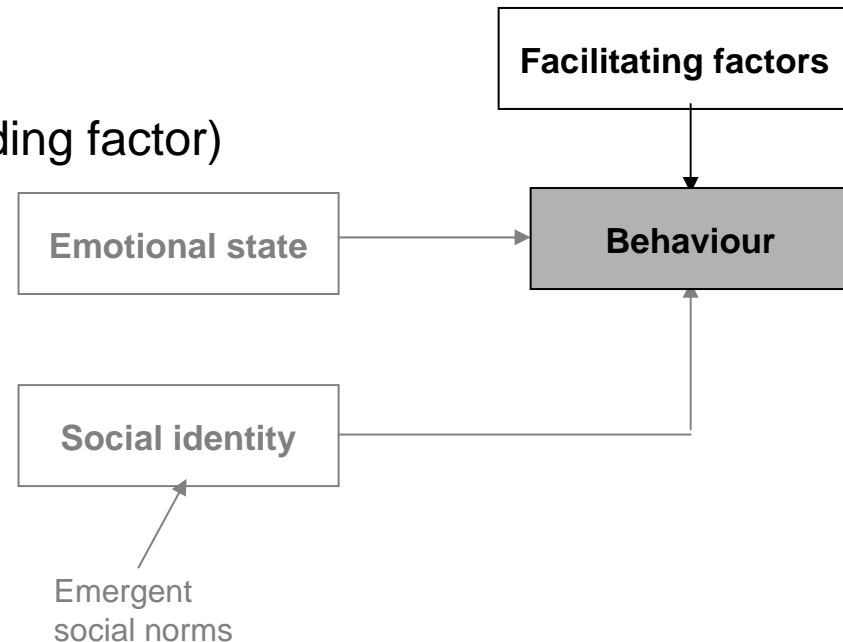
How crowd behaviour could be explained?

- Assumption 1: The reinforcement or extinction of the behaviour depends on the perceived consequences of it.

  - Examples of consequences leading to a reinforcement
    - Feeling of empowerment, feeling that they can "make things happen", an impact on the events, reaching the objective or the desired situation.
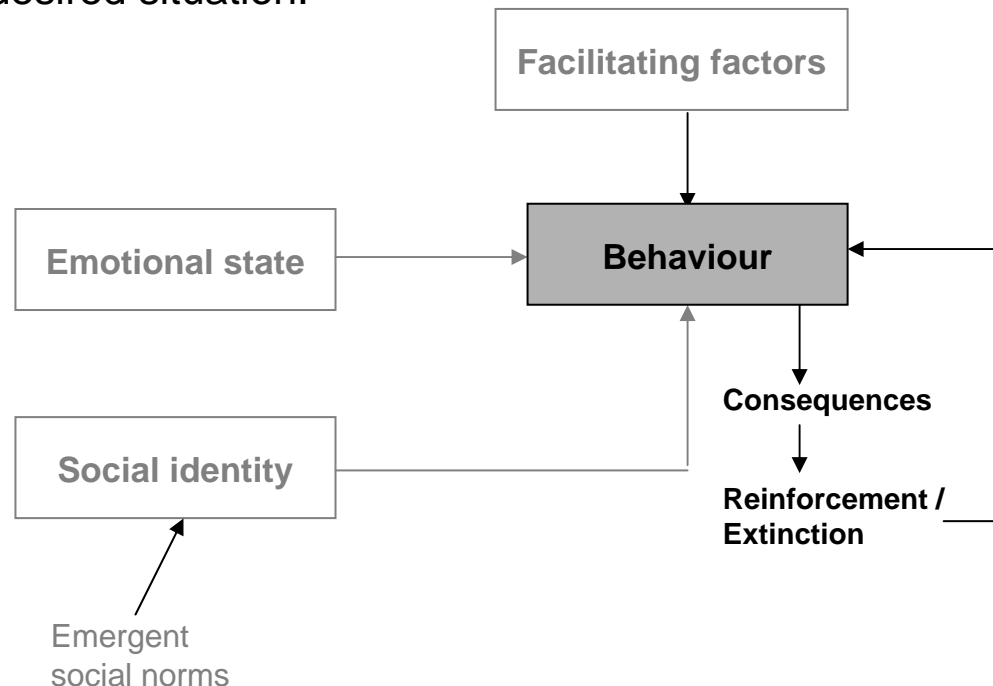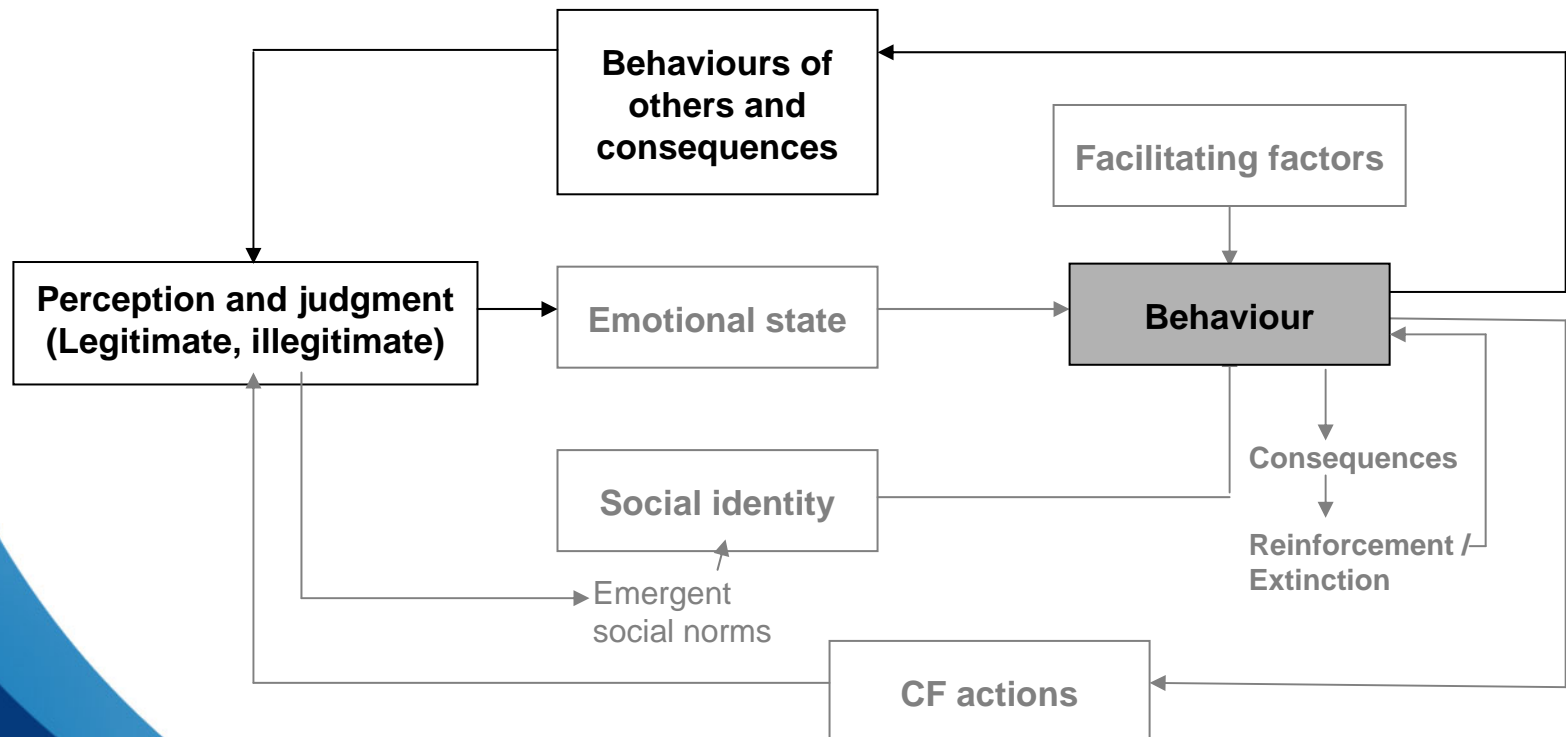
How crowd behaviour could be explained?

- Assumption 2: The perception of illegitimacy of the control forces actions could lead to a shift of social identity.

- Assumption 3: The perception of illegitimacy of the control force actions increase emotional state (mainly frustration), which could lead to aggressive behaviour.
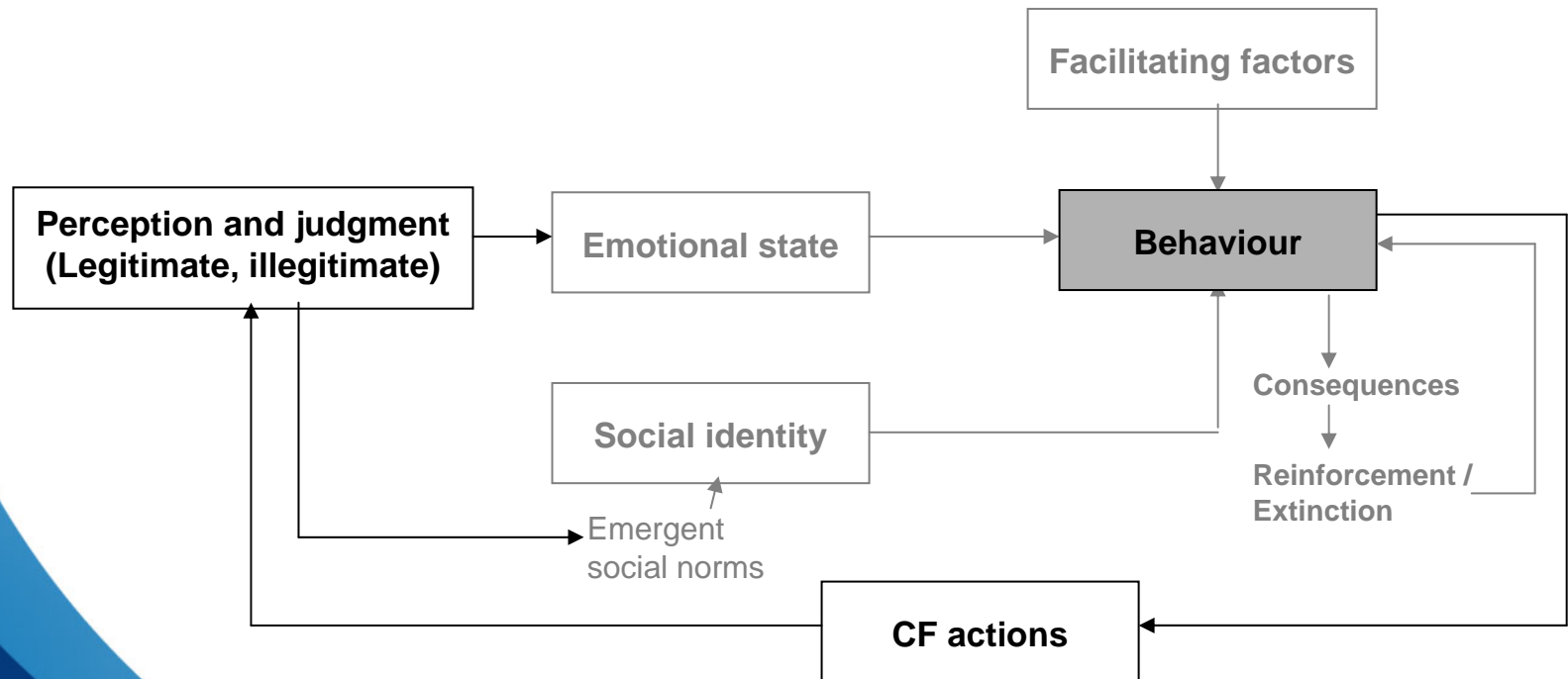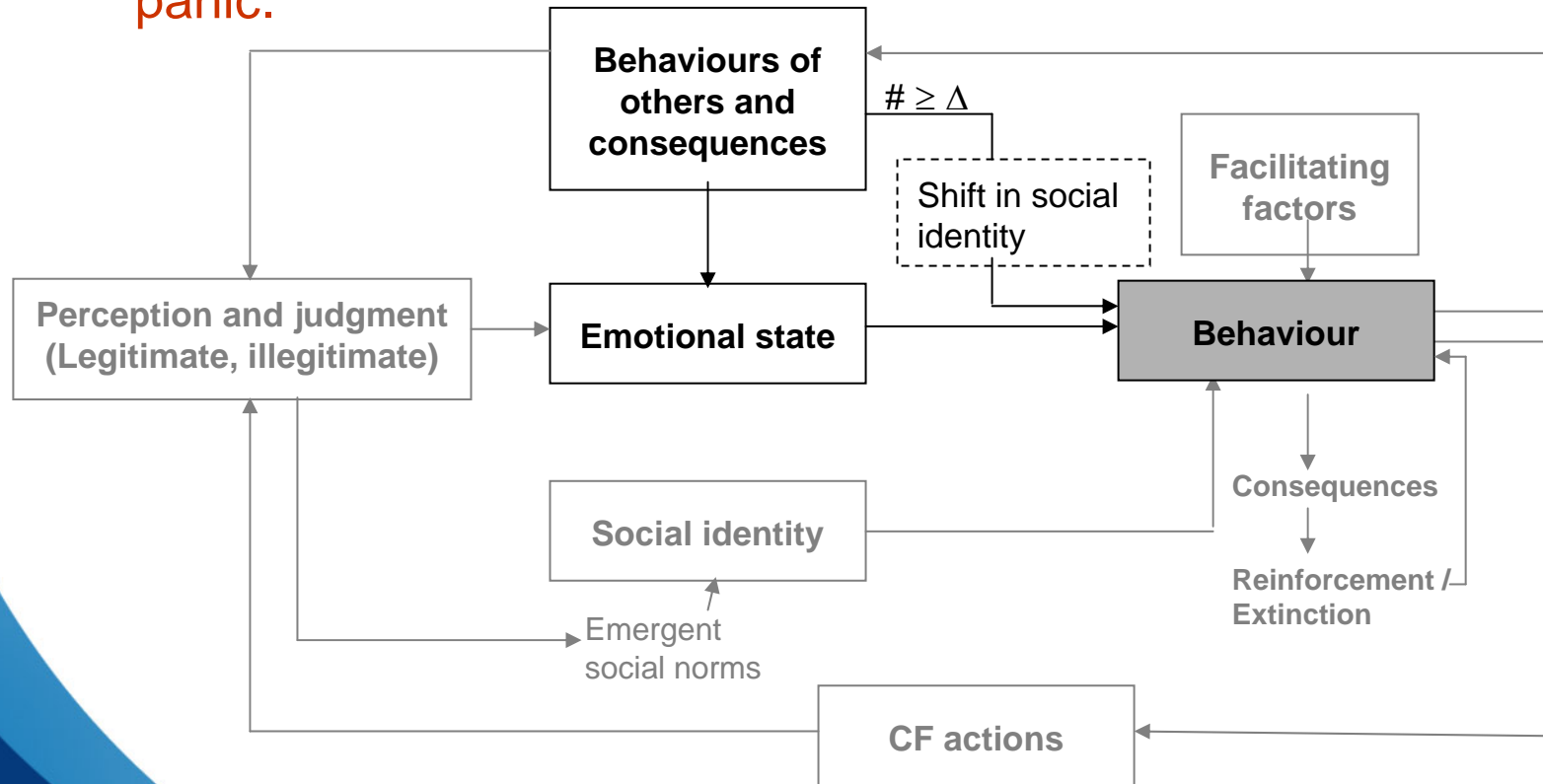
How crowd behaviour could be explained?

- Assumption 4: The observation of the neighbours behaviours and the perception of their consequences influence the emotional state of the individual.

- Assumption 5: The perception of neighbours aggressive behaviours as legitimate lead to a shift of social identity.

How crowd behaviour could be explained?

- Assumption 6: Imitation is likely to occur when the behaviour observed within the neighbours leads to an unconscious shift in social identity.

- Assumption 7: Imitation is likely to occur in situation of panic.

How crowd behaviour could be explained?

- Assumption 8: The perception and judgment of the out-group (control forces or other groups) behaviours is influenced by personal factors and external factors.

  - ➤ Personal factors
    - o Gender (male/female)
    - o Age
    - o Socio-economic status
    - o Ethnicity
    - o Culture

  - ➤ External factors
    - o Weather
    - o Environment
    - o Noise, music
    - o Time since the beginning of the event
    - o Fatigue
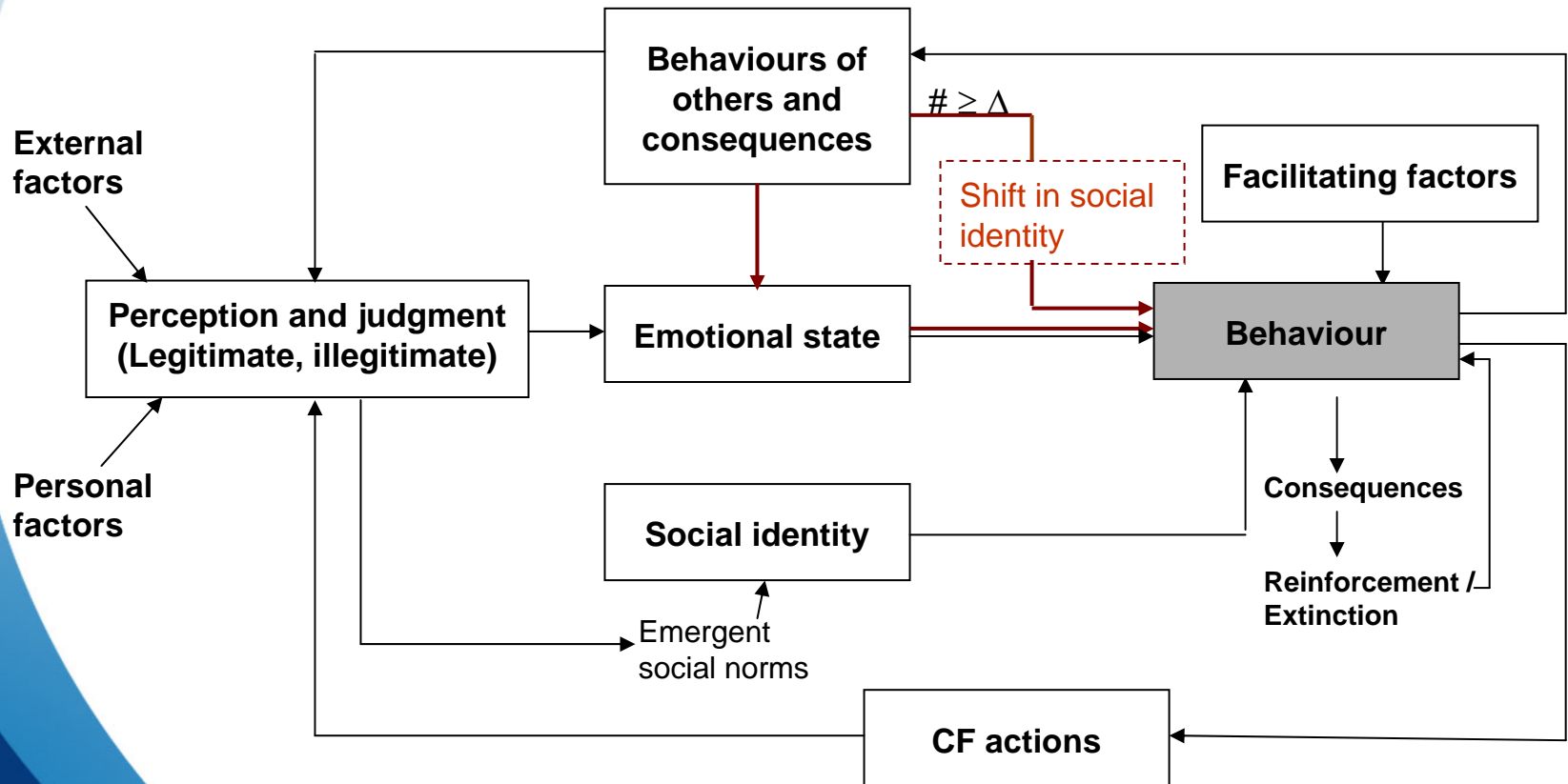   - o Rumours
    - o Threats

How crowd behaviour could be explained?
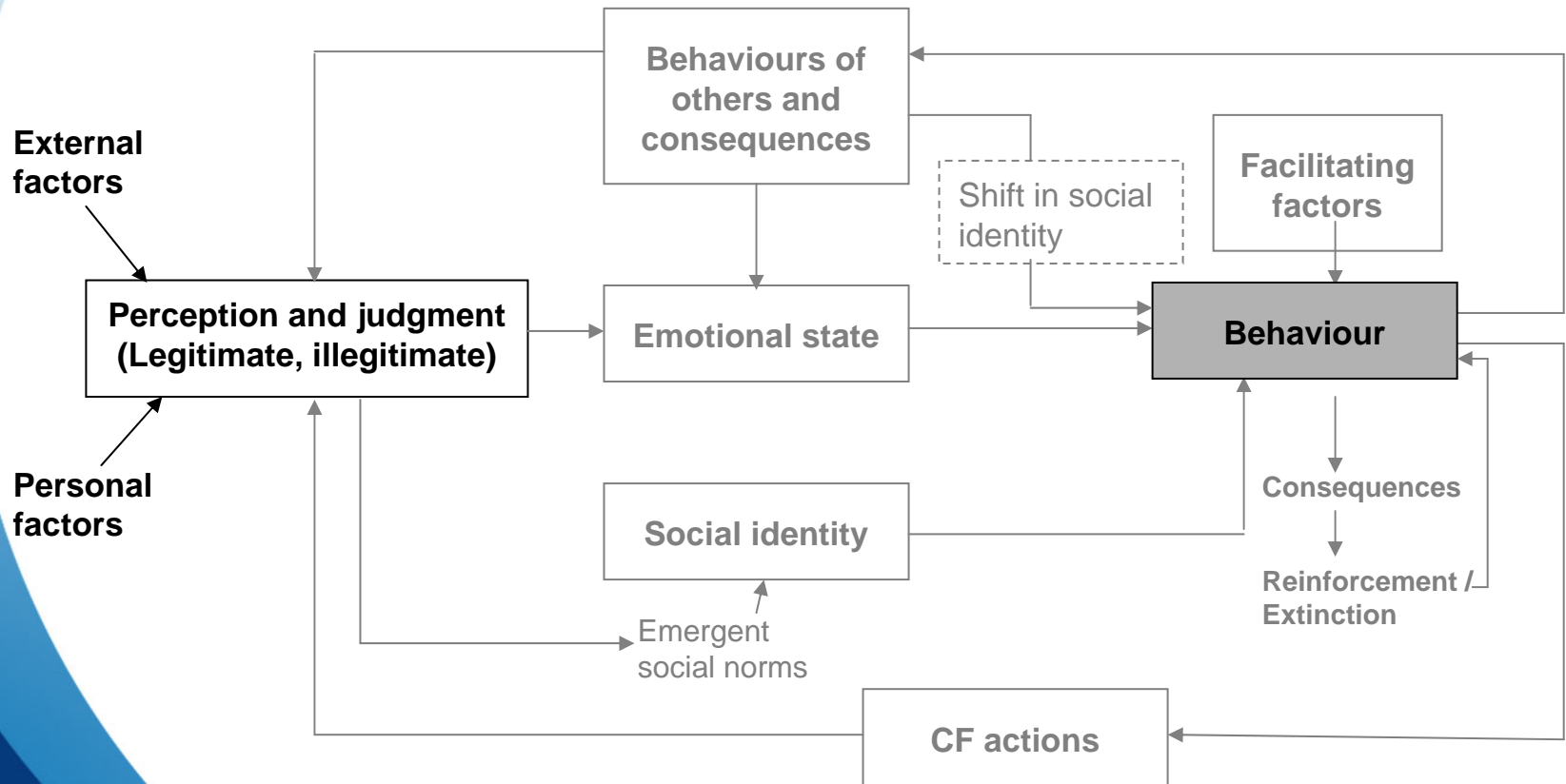
Conceptual model

Model explaining the behaviour of an individual within a crowd

Conclusions

- This work attempts to better understand crowds and crowd behaviour.

- It proposes a conceptual model explaining behaviour of an individual within a crowd.

  - ➢ The proposed model regroups several types of variables: sociological, psychological, physiological and perceptual.

- The model is generic: could be applied for different types of protesters (leaders, followers) within different context.

- A number of assumptions is proposed to be used as a basis in future work for the modeling of behaviours of individuals.