

Demonstrating a Framework for Modelling the Effect of Emotion on Uncritical Reasoning

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Scope: Exploring the modelling and simulation of external groups taking account of emotion and uncritical thinking and cognition

Description: We demonstrate our current research on understanding group mutability in the behaviour of external groups, and how interventions by coalition forces might affect the behaviour in terms of controlling hostile groups and encouraging friendly groups. This research explores how emotion may influence the behaviour of individuals by affecting the type of reasoning that they undertake, encouraging "uncritical" rather than "critical" thinking.

The demonstration will show a computational framework holding a cognitive model of an individual operating within a group context, inspired by theories from social science. Individuals relate to in-groups and out-groups and have beliefs that are associated with emotions. Cognitive Appraisal Theory is used to evaluate incoming memes "pronounced" by external speakers, appraising the effects of the memes on an individual's self-esteem taking account of their group relationships as indicated by social identity theory, and leading to an emotion in the individual. Appraisal is followed by a process of coping that seeks to handle the effects by either performing problem-focused (critical) or emotion-focused (uncritical) thinking, according to the current emotional state of the individual.

We demonstrate the running of this model within the Soar Cognitive Architecture as a set of reasoning processes and rules that handle beliefs and emotion, and will show how a cognitive model may be constructed and tested. We will also demonstrate a multi-agent simulation based on the integration of multiple instances of the cognitive agents running within a simulation tool, Repast Symphony. This simulation is based upon a scenario where populations of individuals move in a geographical space and interact with each other, seeking to spreading rumours, or memes. The results of the simulation is shown in two ways: as a geographic diagram of the movement of individuals with their affiliations and emotional levels; and as a time series graph of key model variables, such as the reach of memes, average emotional levels, and membership of different groups.

We also describe some initial research on the use of rationale in two different areas: firstly in the communication between individuals, covering the passing of "reasons" for the memes the use of assumptions and the challenging of assumptions as part of interventions; secondly in a novel extension to the core Soar system covering the use of rationale to help understand the operation of the rules.

Thus we will aim to show how this framework could be used to construct experiments to explore how different situations lead to group mutability and behaviour, together with the effects of interventions by coalition forces.

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