Agent-Based Modeling and Social Emergence II

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Outline

1. Models of Social Emergence
2. History of ABM
3. Limitations
4. **Case Study: Simulating Virtue Ethics**

Outline

1. What is Virtue Ethics?
2. The Situationist Critique
3. Experiment Design
4. Results and Discussions

What is Virtue Ethics?

- Ancient Greek: there is a natural order of the universe, and humans have a place in it.
- Nature determines that virtue is connected to Eudaimonia (well-being/happiness)
- Cardinal Virtues (Areté): Wisdom, Justice, Fortitude, Temperance

What is Virtue Ethics?

They disagree about...

- Human nature
- What the world is like
- Happiness vs. virtue
- Important virtues

Homer's Iliad and Odyssey

- There is a natural order in which each person has a social role;
- There are virtues that enable the person to perform that role well.
- Homeric Scale of Values, values of warrior.

Plato and Aristotle

- Plato's Republic: what is justice? why should we want to be just?
- Nature, function or role, virtue, happiness
- Nicomachean Ethics:
  - Everyone agrees that the aim of human living is a good life.
  - Eudaimonia, happiness, well-being or flourish
  - Disagree about the kind of life that is happy

Plato and Aristotle

- Aristotle's question: What is the ergon (function) of a human being as a human being?

- He claims: "the function of a thing is determined by the kind of thing that it is."

- Plato's example: the function of each kind of animal has something to do with what makes that kind of animal different from other kinds.

- What makes us different is our power of reason.

- A virtue or excellence is a quality that enables an animal to perform its function well.

Plato and Aristotle

1. The end by nature of any kind of animal is to live well
2. To live well is to perform well the function of that kind of animal
3. The function of a kind of animal is the performance of distinctive activities of that kind of animal
4. A virtue is a quality that enables an animal to perform its function well
5. What is distinctive of humans is the power of reason
6. A human virtue is a quality that enables humans to perform characteristic human activities under the governance of reason
7. A life of human well-being, or happiness, is a life of characteristic human activities lived virtuously

Stoicism

- Aristotle: Happiness requires some good fortune in addition to virtue
- Only virtue is good and contributes to happiness; only vice is bad and contributes to unhappiness.
- Health, wealth, beauty, flourishing of friends are neither good or bad, and make no difference to one's happiness.

Stoicism

Stoics: Virtues = Knowledge

- Practical Wisdom: knowledge of what to do
- Temperance: knowledge of how much of a good thing to choose
- Justice: knowledge of the right distribution of goods to persons
- Courage: knowledge to what is terrible and what is not

Stoicism

- To live virtuously is not to live distinctly a human way, but we should live through the knowledge of all nature.

- The core of human reason is identical with the reason of Zeus, who governs the entire cosmos. So a virtuous person aims to take on the perspective of cosmic nature.

- Do we have control of our happiness? Yes and no.

- Winds of fortune do not affect the happiness of the virtuous person.

- The wise person accepts fate, that is the secret of happiness.

Christian Morality: Augustine

- Happiness is the enjoyment of the chief human good. Cannot be lost against the will.
- The chief human good is not chief of the body only, but is the good of the soul.
- Virtue gives perfection to the soul.
- The soul obtains virtue by following God. That is the happy life.

Christian Morality: Thomas Aquinas

- Human beings are part of nature.
- We have an end (eternal happiness and well-being) which is in the vision of God in Heaven.
- There are the four cardinal virtues, but also theological virtues: faith, hope, charity.
- Any human being can be happy.
- The doctrine of the fall: although Human nature is fundamentally good, human beings fell from an original state of grace and henceforth have an inborn proclivity to evil.

The Modern Era

- many doubted that there is any human nature to guide a
  moral framework and determine the kind of life that would be
  fulfilling for each person.

- The protestant reformation lead to the debates that question
  the consistency of Aristotle's philosophy and Christianity.

- Scientific Revolution found that most of Aristotle's ideas
  about nature are wrong, including human nature.

- The age of global trade, people starts to meet others with
  different understandings of human nature.

The Modern Era

- Kant: duty rather than virtue. Make minimal assumptions about human nature and focus on the demands of rationality.
- John Stuart Mill, Jeremy Bentham: maximize happiness (sensory pleasure) for the greatest number of people.
- Since it was not based on a controversial theory of human nature and was simple in form, it had great influence in the law, politics and economics.

Elizabeth Anscombe

- "Modern Moral Philosophy"
- English moral philosophers did not differ from each other in any important sense. They all had given up the idea of a virtue as well as the idea of happiness in the sense of fulfillment rather than pleasure.
- Obligation had become the central concept in ethics. They had also detached from their religious foundation.
- There is a god who legislates morality and is the source of our moral obligation vs. Give up obligation as the central moral concept and go back to virtue theory.

Virtue Theory
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Situationist Critique
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Experiment Design
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Discussion
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Outline

1 What is Virtue Ethics?

2 **The Situationist Critique**

3 Experiment Design

4 Results and Discussions

Social Psychology Experiments

- The Milgram Obedience Experiments
- The Good Samaritan Study
- Isen and Levin's Mood Studies

The Situationist Critique

- Situationism is the view that behavioral variation across a population owes more to situational differences than dispositional differences among persons.

- The situationist critique refers to the argument made by philosophical situationists, in particular Harman, Doris, and Merritt, namely that research in empirical psychology calls into question the plausibility of virtue ethics as a normative theory.

The Situationist Critique

The first wave:

- Virtues are understood as robust dispositional traits, that is, traits that lead us to act in similar ways in a variety of situations and in repeated instances of such situations.

- But empirical research shows that most people do not possess robust character traits, and that behavior is best explained by situational influences.

- So if most people don't have the virtues, then we cannot become the kind of beings that virtue ethics tells us to become. It follows that virtue ethics is deeply flawed.

The Situationist Critique

In response, some virtue ethicists argue that:

- The situationist experiments merely confirm what Aristotelian virtue ethicists have been saying all along, namely, that virtue is rare and difficult to achieve.

- Very few people possess the virtues, but this only means we should find better (empirically grounded) strategies for acquiring virtue.

- The situationist critique is based in a crude behaviorist model of character. It views character as a set of dispositions to act in certain ways while ignoring internal dispositional factors. If we consider the inner states of participants, we will find important differences in character.

The Situationist Critique

The second wave:

- human behavior is not the outcome of conscious and rational thought.

- Rationality is fragmented, involving both conscious and non-conscious processes, and these often come into conflict.

- The implication of this is that we cannot have the kind of coherent character that virtue ethics sees as the ideal.

Outline

1 What is Virtue Ethics?

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3 **Experiment Design**

4 Results and Discussions

How to Use ABM to Respond to the Situational Critique?

- Virtue is different from best personal consequence in the short run.

- In the long run, virtue is also related to how other people behave. If enough people are virtuous people, then best long-run result would be realized.

- virtue would lead to both personal long run good consequence and group long run good consequence. So virtue is not the same as any one of them.

How to Use ABM to Respond to the Situational Critique?

- We cannot eliminate the possibility of learning virtue from other virtuous people.

- Virtue might not be realized in real world, but we cannot deny the possibility of improving one's moral behavior through conscious adjustment.

- By following virtuous people's action on purpose, people can become more virtuous under similar situations.

- Rejecting the possibility of this would be rejecting free will or conscious action completely.

How to Use ABM to Respond to the Situational Critique?

- Even if being virtuous is difficult and we might be largely determined by situations in reality, as long as there is a possibility of conscious learning of virtue or virtuous trait, we can simply define the existence of virtue and make it real by using it to guide our behavior.

- The idea is to separate the unconscious behavior adaptation processes from the conscious virtue learning process. We can define virtue consciously and use our own definition to guide our behavior consciously.

The Setup of the Experiment

- El Farol Model (Arthur, 1994, AER)
- 100 people in Santa Fe, NM like Irish Music. On Thursday an Irish band plays at El Farol (The Lantern)
- However if more than 60 people are at the bar then its crowded and no one has fun
- The newspaper publishes the attendance each week. On the basis of the past n weeks how do individuals decide whether or not to go to the bar?

W. Brian Arthur's Formulation

- Individual have a bag of strategies to predict attendance
- Every strategy is a list of real numbers with size memory $+ 1$, and the prediction of attendance using memory or history data is achieved by a linear model, with strategy numbers as linear parameters.
- Each agent determines which strategy would have worked the best had they used it the last five weeks
- They then use that strategy to predict what this week's attendance will be and decide whether to go to the bar on that basis

The Question of the El Farol Bar Problem

- Most humans do not act rationally, they act in a boundedly rational way
- Most humans do not reason deductively from first principles, they reason inductively from past experience
- If you assume agents participating in this way act this way, what are the results?
- I model the conscious process using Arthur's model setup.

The Unconscious Learning Component

- Aside from the conscious process, I add an unconscious component to the model of agent cognition.

- I model the unconscious learning process using Ido Erev and Alvin E. Roth's reinforcement learning method.

- The idea is to define a propensity property [a, b] for every agent, and update the corresponding property whenever the agent get a reward from a real action.

- Agent determine their action by weighing the suggestions of both conscious and unconscious cognition component of the agent.

Virtue Theory
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Situationist Critique
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Experiment Design
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Discussion
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Experiments

- The effect of conscious learning of the virtue of justice or fairness in both the individual and group level. They are making a difference.

- Experiments: what is the effect of virtuous people? how these traits contribute to the good of society and/or to the happiness of their possessors?

- See the Demo

The Argument

- The ABM model helps clarify the role of virtue in decision making with moral elements.

- The ABM model support the virtue ethics in that it shows that even fictitious concept of virtue has a role in affecting both the individual behavior and the group level effects.

- The ABM model also support the virtue ethics in that it shows that learning fictitious concept of virtue through conscious process of reasoning has a role in affecting both the individual behavior and the group level effects.

- It is hard to argue that conscious learning of the virtue is completely impossible.

Virtue Theory
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Discussion

Netlogo Demo

References

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