Social-psychological models for computational social science

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Abstract

Social models for human interaction at scale, such as the ones used to predict the diffusion of information or adoption of beliefs through social media, can start from individual or social assumptions about human behavior. Equally important is to consider the purposive nature of human behavior. Currently, individual action is privileged, although without a purposive component. Social-driven and intention-aware models are needed to enhance our understanding of computationally derived social-behavioral models applied to data collected from social media.

The two traditions

In 1987, at the peak of her power and in a moment of ideological strife, Margaret Thatcher set the world on fire affirming that "there is no such thing as society" (Thatcher, 1987). Her exclamation was more than a political act. It was an epistemological call to reconsider where human action (and policy) should come from. In her opinion, these resided in individual wills and needs. Society, in her view, is an abstraction. It cannot address social ills of any kind, from educational gaps to homeless or unemployment, if individuals do not take charge of their lives. In her words "people have been given to understand 'I have a problem, it is the Government's job to cope with it!' or 'I have a problem, I will go and get a grant to cope with it!' 'I am homeless, the Government must house me!' and so they are casting their problems on society and who is society? There is no such thing! There are individual men and women and there are families and no government can do anything except through people and people look to themselves first." In her own, combative way, Thatcher was casting the radical individualist idea that society is the aggregation of individual wills. Her vision came at that point in contrast to the social-democratic or socialist visions, which saw human needs and shortcomings as creations of societal forces greater than any individual will. That tradition extracted its force from Marx's work, who stated the opposite intellectual case to Thatcher by affirming that modern, industrial society is not "a sack of potatoes." In "The 18ᵗʰ Brumaire of Louis Bonaparte," Marx opposed the isolated, small-holding life of traditional European peasants to the tightly integrated life of modern workers (Marx, 1994). While the former lived in narrow, individual circles of almost autarkic life, the later lived in society-wide groups of tight interconnections. Modern people live in classes and society itself is a tightly interwoven class-based edifice. Classes and the society they build have identity, needs, and political programs that act as one, impinging on individual decisions. Class for Marx is an entity that is larger than the sum of its parts, which it is both rooted in and expressed by individual needs, yet never reducible to them.

Marx's ideas are not unique, despite his radical interpretation of their significance. The French founder of modern sociology, Emile Durkheim, affirmed in even more forceful terms that society is an objective fact (Durkheim, 2014). Society has compelling rules and tangible abilities that control individual will. Phenomena such as language, religion, norms, social identities, or institutions such as fiduciary currency are social facts. In Durkheim's words "A social fact is any way of acting, whether fixed or not, capable of

exerting over the individual an external constraint" (p. 59).

From traditions to sociological models

The debate between individualism and socially-inflected action is well known in sociology, where we talk about the "methodological individualist" and "sociological holism" (Babbie, 2016) These are not political positions, but scientific ones. They speak about the first assumptions we make about the world; about the source and meaning of human action.

However, these basic assumptions about social phenomena seem to have escaped the attention of computational scientists engaged in the most exciting social research projects regarding the most burning issues of the day.

A new breed of social scientific research, often rooted in massive access to individual records of social media content and behaviors, has become keenly interested and at times provided trenchant verdicts about a variety of human processes. This type of research is rooted in behavioral models inspired by physics and is shaped by unconscious beliefs in the validity of the individualistic, stimulus-response explanation for human behavior. This work (McPherson et al., 2001) is also anchored in the idea that most social behaviors can be induced by imitation by homophily ("birds of a feather flock together"). While alluding to the socially-inflected vision, the homophily argument remains solidly anchored in methodological individualism. Research inspired by this vision proposes that emotions can be changed by contagion (Kramer et al., 2014) and polarization created by social media (Spohr, 2017). While the possibility that some of these effects are real cannot be simply brushed aside, we need to avoid spurious arguments by scrutinizing their premises.

The four causes of human action

Scrutiny should start from the assumption that human behavior has, in Aristotelian terms (Falcon, 2022), four causes: intentional (teleologic), efficient, material, and formal. When humans act, they do so first because they will it. There is always a specific intention that is proposed as an ideal goal. Humans also have the ability to plan and execute consciously,

adjusting as needed their activity. This is the efficient, planned action, cause of any human action. Then, acts are shaped by what is materially available to enact the action or by the hard constraints of norms or institutions. Finally, actions are executed according to templates or formal actional processes.

While the four causes methodology sounds antiquated, it is in fact quite contemporary. Bandura's social learning theory (Bandura, 1977), has developed a rich and scientifically testable system of concepts that speak about all four causes, which provides both individual and social explanations for human behavior. Concepts such as vicarious observation and learning, planned action, self-efficacy, and self-regulation are ready-made for future research in this vein.

The most important goal of future computational social science research is to propose human behavioral models that consider both social and individual motivators and constraints while providing for human intentions and planning to change the course of human behavior.

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