Emotional Well-Being in the Digital Society

Abstract

Our emotional well-being is highly influenced by our environment, including our social interaction. Understanding human happiness requires a complex systems approach that can answer how we can strive towards a developed and sustainable society that maintains life satisfaction. We live in a Digital Society, in which we constantly produce data that can allow us to empirically support a complex systems approach to emotional well-being. Models of complex emotional behavior can be validated though applications of Big Data analytics and sentiment analysis to the online activity of millions of citizens. I propose an interdisciplinary project that combines Complexity Science with the Social and Computing Sciences to further our understanding of the fundamental dynamics of emotional well-being. Building on computational models of emotions, we can create the next generation of network spreading models that include cognitive constraints and emotional behavior, with the aim to understand how emotions lead to cascades and influence social resilience. The ultimate aim of the project is to reach a new level of understanding of human emotions and apply it to develop technologies that improve the emotional well-being of whole societies. I propose to use an agent-based modelling approach to achieve a consistent understanding across levels of aggregation, explaining how social interaction in the presence of emotions leads to social phenomena at higher levels. This modelling approach will connect three levels of analysis: * Microscopic level: I propose to analyze individual emotion dynamics as manifested through digital traces. We will apply sentiment analysis to textual expression in online media, tracking how individuals publicly express their emotions. These data will serve as empirical sentiment signals to validate and calibrate agent-based models. The variation of the dynamics across individuals will serve as an input to study their relation to mental health and well-being, through temporal and social patterns of emotional expression. * Mesoscopic level: This level will build on the findings of the microscopic level to formulate models of collective emotions and emotional information spreading. Collective emotions are an example of group behavior that emerges from the interactions of individuals in the online medium, as a transient state. We will model information spreading in a networked environment in which nodes are individuals with emotions, and empirical data on online spreading of information will serve to test the model. We will apply the insights of these analyses on the context of spreading of health-related information and behavior, to develop predictors of cascade sizes. * Macroscopic level: We will study emotional well-being at the level of whole societies and online communities. We will study how emotions influence cascades of disconnection and inactivity in online communities, to derive principles that explain social resilience from individual behavior and interaction. We will measure emotional well-being through digital macroscopes, with the aim to study the temporal relationship between emotional well-being and human development. These results will be integrated in a model that combines individual emotions and decisions to explain the emergence of unfairness and vicious spirals that can perpetuate poverty. The scientific results of all three levels will be applied to design technologies to enhance emotional well-being, including social media applications, detectors of collective emotions, and predictors of emotional information cascades. Resilience analysis results will be phrased as mediation strategies for online community managers, and macroscopic analyses will lead to the calculation of a real-time index of national emotional well-being, to inform human development policies. The combination of Big Data with this generative approach to complex social and emotional dynamics promises the reach to unpredecented scales and resolutions in scientific understanding, user-centered design, clinical interventions, and data-driven policy making.

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103029 - Statistical physics (40%) | 501021 - Social psychology (30%) | 202022 - Information technology (20%) |

303027 - Social medicine (10%)

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Further links about the involved persons and regarding the project you can find at
https://archiv.wwtf.at/programmes/vienna_research_groups/VRG16-005