

Contagion of Depression in Social Networks among Adolescents: A Network-based Approach

The high prevalence of depression imposes detrimental consequences on individuals and society, reaching \$16 trillion annual productivity loss by 2030 globally (Lancet Global Health, 2020). The high prevalence of depression among adolescents has received great attention, as the influence of depression onset during adolescence persisted ten years later. A survey in Hong Kong found 51.9% of secondary students reporting mild to severe depressive symptoms. These trends give urgency to the priority of investigating the development of depression and gaining insights for effective program development to prevent depression among adolescents. In addition to biological and environmental factors, interpersonal factors play an important role in the emergence of depression. Depression can be socially transmitted through social interactions with friends, family, and on social media (i.e., the contagion of depression). With the limited but consistent findings, co-rumination, an interpersonal process that refers to the extensive talking of the problems, was found to explain the contagion of depression. Some important research gaps remain. First, the evidence for the contagion of depression was mostly obtained in dyadic peer close relationships, which make up only parts of social relationships. These findings thus might underestimate the power of social contagion of depression because direct (e.g., friends) and indirect relationships (e.g., a friend's a friend) can both affect adolescent development. Returning to a more comprehensive scope of social networks is needed. Thus, an approach that maximizes the capturing of all possible relationships is essential. Second, limited work has been conducted to understand the conditions of when the contagion of depression via co-rumination is alleviated. Much previous research mainly focused on non-changeable factors (e.g., gender), which could not be cultivated or weakened in intervention programs. Thus, only limited insights into developing possible interventions are available. To examine the development of depression in social networks among adolescents over time and to explore the boundary conditions, this proposed project adopts a network-based perspective. Specifically, agent-based models will be parameterized with the rules relevant to the exposure to depression in different social relationships (i.e., peers, family, and social media), co-rumination, emotional awareness (i.e., the ability to sense, understand, and comprehend emotions), and resilience (i.e., the capacity to recover from stress and adapt to difficult life experiences) based on a real-life longitudinal study. With these findings, we will gain important insights into how depression is developed in social networks among adolescents, which will bring important academic, practical, and social impacts.