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How Do Emotional Dynamics in Social Media Language Reflect Depression Risk? An NLP-Based Analysis

Abstract

Depression remains undetected in digital contexts, and prior NLP approaches to prediction often lack psychological grounding. This work addresses this gap by investigating how temporal dynamics in emotional language on social media reflect depression risk. Drawing from clinical psychology and affective computing, we analyze longitudinal Reddit data from over 5,000 users (r/depression vs. matched controls). Emotional features, including valence trajectory, agency shifts, and pronoun use, were extracted using lexicon-based (LIWC, VADER) and transformer-based models. Mixed-effects regression and changepoint detection were employed to model fine-grained emotional fluctuations before and after users' self-disclosure of depression. Preliminary findings suggest that increasing emotional volatility, declining agency, and non-linear shifts in affective tone may precede depression expression. This study offers a construct-valid, temporally sensitive framework for detecting mental health risk in language. It advances NLP for mental health by aligning linguistic features with psychological theory and emphasizing the temporal unfolding of emotional signals in naturalistic text.

Keywords: Natural Language Processing, Emotion, Emotion Disorder, Social Media Analysis