

Combining Survey Items and Digital Traces to Measure Workplace Depression

Keywords: workplace depression, mental health, company reviews, NLP for psychology, SBERT

Extended Abstract

Workplace depression caused by adverse working environments damages employees' well-being, motivation, and performance, leading to a significant loss of productivity and competitiveness for many organizations [3]. However, the lack of a specific approach to assess the depressive symptoms that employees experience in the workplace led to overgeneralized examinations of depression, which have limited relevance to the organizational context. Typically, to assess employees' mental health problems, a company would administer tailored surveys that capture work-depressive situations; due to their high cost [5], these are often restricted to a limited pool of self-selected participants [2].

Our work set out to identify the factors influencing workplace depression and to assess its association with organizations, industry sectors, and the broader socio-economic environment. It does this through a large scale assessment of 350K geo-referenced employees reviews about 104 S&P 500 companies that is informed by the Occupational Depression Inventory (ODI) construct and measurement scale [1]. Unlike non-workplace specific depression scales or measurements related to work stress (e.g., burnout), the ODI is designed to quantify the severity of work-attributed depressive symptoms through a nine-item scale. We combine these survey items and company reviews in a mixed-method framework (Figure 1) to measure workplace depression and its correlated factors.

Data and Methods. We collected data from a popular company reviewing site, where current and former employees write reviews about their own corporate experiences, ranging from job interviews to salaries to workplace culture. As of 2021, there are 50M monthly visitors on the platform, and 70M reviews of 1.3M companies. Our dataset consisted of reviews published over twelve years, from 2008 to 2020. Each review consists of a title; a 'pro' portion (i.e., positive aspects of the company); a 'con' portion (i.e., its negative aspects); a set of four ratings on a [0,5] scale scoring different aspects of the company. Since reviewers have the option to include their location, we were able to identify the states for part of the reviews. To ensure the robustness of our text processing method, we retained companies that had at least 1,000 reviews and were present in at least 10 states, leaving us with a dataset of 358,527 reviews of 104 US-based companies. These reviews represented 88.7% of the original dataset, and 80% of these companies were S&P 500.

We developed a state-of-the-art deep-learning Natural Language Processing (NLP) framework that accurately delineates the micro foundations of depression in the workplace from the perspective of each company's employees (Figure 1), which we then empirically validated. Specifically, we develop an unsupervised deep-learning framework based on the sentence-level BERT algorithm [4] (SBERT).

Results. Our research offers substantive contributions to the multidisciplinary research on depression in the workplace. We found that high ODI scores were associated with market performance deterioration. In particular, we found that companies with high ODI scores suffered from lower online ratings and, more importantly, lower financial growth (Figure 2).

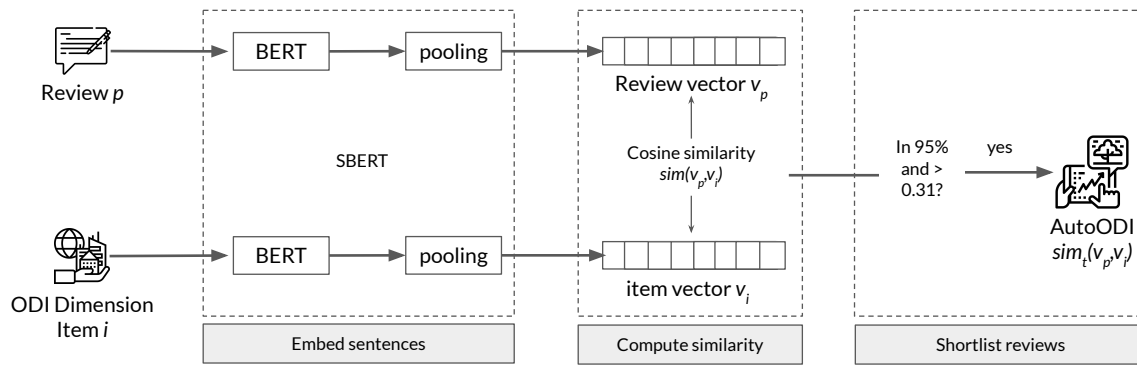


Figure 1: Schematic of AutoODI. It consists of three blocks, which: 1) embed both the review and the ODI dimension's sentence definition; 2) compute the cosine similarity between the two embeddings; and 3) shortlist reviews by discarding those that are below a given similarity level.

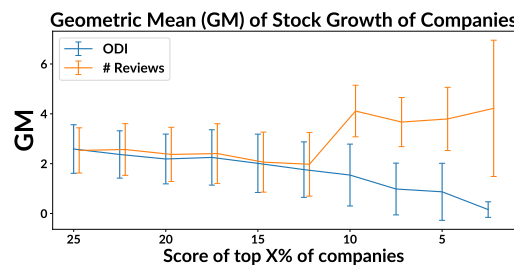


Figure 2: Geometric mean of stock growth values for the top x% of companies ranked by ODI scores, and by number of reviews. The lower a company's ranking, the more reviews and the higher ODI score the company has.

By highlighting the importance of targeted interventions and schemes that support employees' well-being, our findings offer potential practical implications for managers and policy-makers who are interested in reducing depression in the workplace and promoting broader socio-economic development.

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