Quantifying attention via dwell time and engagement in a social media browsing environment

Keywords: social media, fake news, digital attention, digital experimentation

Extended Abstract

Modern computational systems have an unprecedented ability to detect, leverage and influence human attention. Social media platforms often leverage vulnerabilities in human psychology to distract users and exploit their attention [4], leading many to argue that the ways digital platforms quantify and extract value from users' attention have led to a crisis in attention [2].

Prior work [3] identified user engagement and dwell time as two key metrics of attention in digital environments, but these metrics have yet to be integrated into a unified model that can advance the theory and practice of digital attention.

We propose a two-stage model (Try + Buy, see Fig 1) that integrates different ways of conceptualizing attention in social media environments (Figure 1). Users are initially exposed to content in an algorithmically-generated newsfeed (Stage 1), and then engage with content conditional on having been exposed to it (Stage 2). Crucially, our model jointly considers distinct attention dynamics at two different stages. First, the extent to which users attend to a piece of content reflects the amount of "trying" (Stage 1), which can be quantified continuously via dwell time. Second, engagement behavior such as sharing or liking content reflects "buying" (Stage 2).

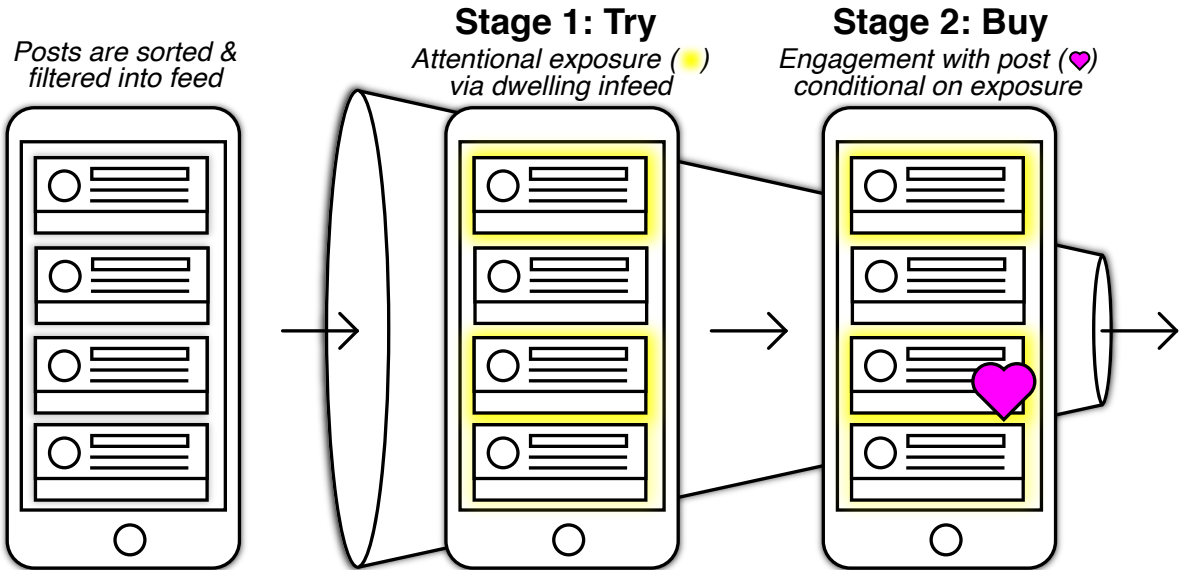

Figure 1: Two stage model

As a pre-test, we recruit N=872 participants (from Lucid) to rate 40/276 social media posts on one of eight dimensions: shareability, familiarity, veracity, favorability for Democrats, provocativeness, informativeness, surprisingness, and impactfulness. Then we collapse these 8 features into two factors (credibility and sensationalism) which explain 55% of the variance.

In an online experiment with N=628 browsing a newsfeed [1] where we measure both dwell time on each post for each participant, and engagement (e.g. sharing) with each post, we show that attention operates differently in these two stages and find clear evidence of dissociation (see Figure 2). For Stage 1, we found that users dwelled longer on posts with higher sensationalism scores ($b = 0.04, p < .001$), but less on posts with higher credibility component) scores (b = -0.02, p = 0.017). But when deciding whether to "buy" content (Stage 2), participants were more likely to engage with credible posts ($b = 0.21, p < .001$), but less likely to engage with sensational posts ($b = -0.22, p < .001$).

These findings have implications for the design and development of computational systems that measure and model human attention, such as newsfeed algorithms on social media.

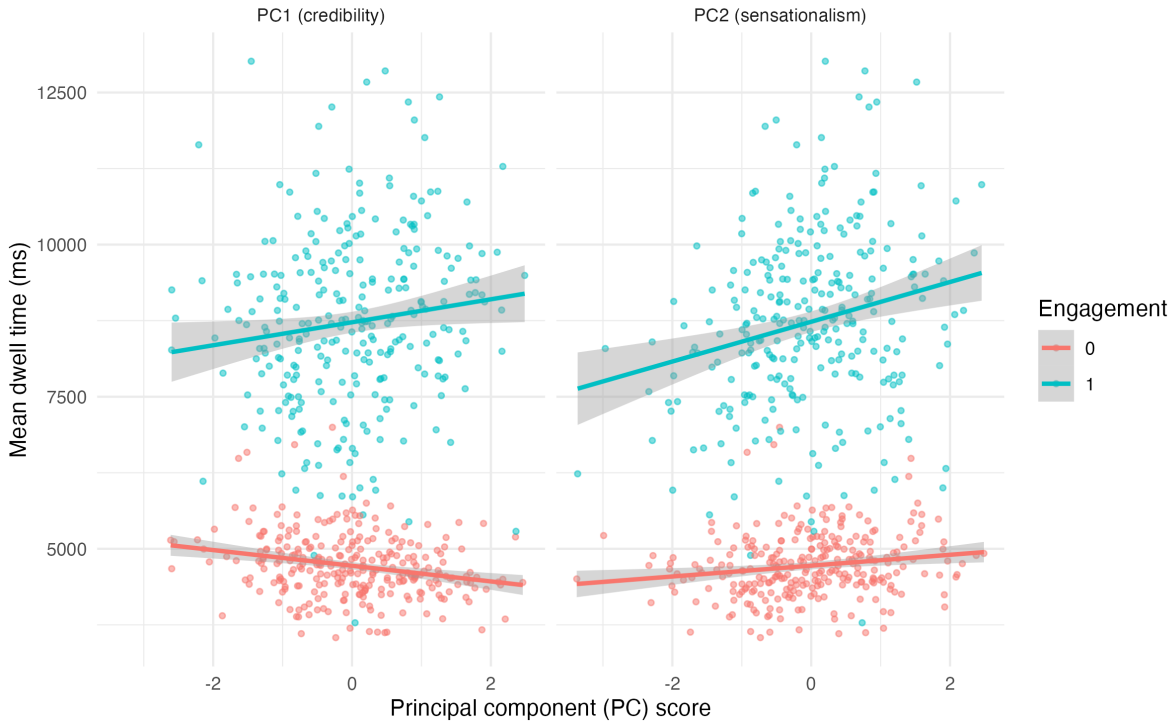

Figure 2: Mean dwell time and engagement by credibility and sensational

References

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