Analyzing Moment-to-Moment Data Using a Bayesian Functional Linear Model: Application to TV Show Pilot Testing

Abstract

Researchers often collect continuous consumer feedback (“moment-to-moment,” or MTM, data) to understand how consumers respond during a variety of experiences (ranging from viewing a TV show to undergoing a colonoscopy). Analyzing how MTM judgments are integrated into overall evaluations allows researchers to determine how the structure of an experience influences consumers’ post-experience satisfaction. However, this analysis is challenging because of the functional nature of MTM data. As such, previous research has typically been limited to identifying the influence of heuristics, such as relying on average intensity, peak, and ending.

We develop a Bayesian functional linear model to study how the different “moments” in the MTM data contribute to the overall judgment. Our approach incorporates a (temporally) weighted average of MTM data as well as specific “patterns” such as peak and trough, thus nesting previous approaches such as the “peak-end” rule as special cases. We apply our methodology to analyze data on TV show pilots collected by CBS. Our results reveal several interesting empirical findings. First, the last quintile of a TV show is weighted around four times as much as each of the first four quintiles. Second, patterns such as peak and trough do not play substantial roles in driving overall evaluations for TV shows. Finally, the last quintile is even more important for procedural dramas than for serial dramas. We discuss the managerial implications of our results and other potential applications of our general methodology.

Keywords: Moment-to-moment data, functional data analysis, Bayesian functional linear model, TV show pilot testing, peak-end rule.