



The importance of suspense and surprise in entertainment demand: Evidence from Wimbledon[☆]



Paolo Bizzozero*, Raphael Flepp, Egon Franck

Department of Business Administration, University of Zurich, Affolternstrasse 56, 8050 Zurich, Switzerland

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ABSTRACT

This paper empirically examines how suspense and surprise affect the demand for entertainment. We use a tennis tournament, the Wimbledon Championships, as a natural laboratory. This setting allows us to both operationalize suspense and surprise by using the audience's beliefs regarding the outcome of the match and observe the demand for live entertainment using TV audience figures. Our match fixed effects estimates of 8563 minute-by-minute observations from 80 men's singles matches between 2009 and 2014 show that both suspense and surprise are drivers of media entertainment demand. In general, surprise seems to be more important in this regard than suspense, and both factors matter more during a match's later moments. We discuss important implications for the design of entertainment content to maximize entertainment demand.

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1. Introduction

Media entertainment plays an important role in people's daily lives. Vorderer et al. (2004) describe media entertainment as enjoyment from consuming media content, whether at home or at an outside venue. Given that entertainment providers are facing stiffer competition in the entertainment market, understanding precisely what factors drive the demand for entertainment content is of critical importance.

Previous studies have identified *suspense* and *surprise* as two major determinants of enjoyment associated with media consumption (e.g., Zillmann, 1991, 1996; Vorderer et al., 2004). The online Cambridge English Dictionary defines suspense as "a feeling of excitement or anxiety while waiting for something uncertain to happen" and surprise as "an unexpected event, or the feeling caused when something unexpected happens." Importantly, both occur exclusively in situations in which there is concern over uncertain outcomes (Comisky and Bryant, 1982).

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* Corresponding author. Tel.: +41 44 634 2913.

E-mail addresses: paolo.bizzozero@business.uzh.ch (P. Bizzozero), raphael.flepp@business.uzh.ch (R. Flepp), egon.franck@business.uzh.ch (E. Franck).

Suspense and surprise are best understood and modeled in a Bayesian setting (Ely et al., 2015). In this setting, probabilities quantify personal beliefs: people form hypotheses about the occurrence of specific events (e.g., “it will rain tomorrow”) and attach probabilities to them based on their subjective levels of belief in these hypotheses (“with a 90% probability”). In the Bayesian view, people will transform their *prior* beliefs into *posterior* beliefs when new and relevant information arrives (Itti and Baldi, 2009). This continuous process of forming and updating beliefs leads to entertainment based on the experience of suspense and surprise, where suspense and surprise are the forward- and backward-looking emotions, respectively.

Suspense evolves through the assessment of future events, with a moment carrying more suspense when some crucial uncertainty is soon to be resolved (Vorderer et al., 2013), such as a researcher opening a letter with the committee’s decision on his or her research grant application. By contrast, surprise evolves by assessing past events, with a moment carrying more surprise immediately after an unexpected event occurs (Itti and Baldi, 2009), such as after an underdog soccer team scoring the winning goal.

Although it is intuitive that suspense and surprise matter in the context of entertainment, empirical tests are difficult to design because people’s beliefs and their enjoyment are hard to observe. Moreover, little is known about the importance of suspense relative to surprise or about their importance with respect to the passage of time. In this paper, we address these questions by employing high-frequency data from a tennis tournament, the Wimbledon Championships, which offers our research two unique advantages.

The first advantage is that we can quantify the audience’s beliefs because modeling tennis situations is possible. In tennis, a Bayesian audience forms beliefs about the final outcome of the match, i.e., about the likelihood that a particular player will win a particular match.¹ We estimate the relevant beliefs at the point-by-point level in two ways: first, we use a Markov model that requires the player’s probability of winning a service point and the current score as inputs; second, we use in-play betting odds.

The second advantage that tennis offers is that the demand for entertainment is observed using high-frequency minute-by-minute live TV audience figures (*ratings*) during the matches. As viewers can easily – and at no cost – switch channels or turn off the TV to maximize their utility from viewing, short-term variations in TV audience figures reflect whether the audience is enjoying a given match (Alavy et al., 2010). By using minute-by-minute information regarding aggregate viewers’ behavior, we can uncover an audience’s underlying preferences for entertainment in a real-world environment.²

This paper contributes to the literature by presenting an analysis of unique and naturally occurring field data that provide a rare opportunity to empirically investigate the importance of suspense and surprise when consuming a media entertainment product. Our empirical analyses show that both suspense and surprise have a positive effect on entertainment demand. Using 8563 minute-by-minute observations from 80 men’s singles matches between 2009 and 2014, our match fixed effects estimates reveal that minutes with more suspense and surprise have significantly higher live TV ratings. This result indicates that suspense and surprise are complementary and that demand for entertainment is stronger for higher levels of suspense and surprise. In particular, a one standard deviation increase in suspense (surprise) is associated with an audience increase of approximately 1200 (2200) viewers per minute. For some perspective, the minute-level effect of a one standard deviation increase in suspense and surprise combined corresponds roughly to a 3% audience increase (based on an average audience of approximately 100,000 viewers in our sample). Although we cannot compare our results with those from previous studies, our estimates suggest that the impact of suspense and surprise on TV audience figures is economically non-trivial.

Moreover, we find that the audience impact of surprise is consistently greater than that for suspense: depending on the model used for computing the audience’s beliefs, the estimated effects for surprise are between two and five times greater than those for suspense. Hence, surprise appears to be more important than suspense in entertainment demand. In addition, over the course of a match, the impact of both suspense and surprise clearly increases. This implies that the entertainment effect of suspense and surprise is larger when the stakes are higher.

To the best of our knowledge, this paper is the first to test Bayesian theory on suspense jointly with surprise under natural conditions. We provide a framework that entertainment industry managers can use to measure an audience’s beliefs, which can then be used to measure entertainment from suspense and surprise. Although in tennis there is not much room for artificially increasing suspense and surprise, the implications of our study are far more important for other entertainment settings in which content can be designed ad hoc to increase the public’s enjoyment. Designers of films, TV series, TV shows, online videos, novels, or gambling games should be aware of people’s preferences for suspense and surprise, their increasing significance towards the end of a media event, and the greater importance of surprise.

The remainder of this paper is organized as follows. Section 2 reviews the literature. Section 3 describes our setting and data. Section 4 outlines the operationalization of suspense and surprise and our empirical methodology. Section 5 presents the empirical results and various robustness checks. Section 6 discusses several implications and concludes.

¹ The same idea can be applied in other settings. For example, people assign probabilities to the hypothesis that a president will be reelected, that a mission will succeed, or that a company’s earnings will beat analysts’ consensus estimates. What differentiates tennis from other settings is the frequency with which events happen and new information is revealed.

² TV remains the central provider of entertainment content despite the increasing supply of entertainment available on the Internet. According to the U.S. Bureau of Labor Statistics, individuals aged 15 and over watched TV for 2.8 h per day on average in 2013, accounting for more than half of their leisure time.

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