

# Measuring Drama in Snakes & Ladders

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*Board games can be judged by different characteristics, which may be subjective in nature but nonetheless useful for describing a game’s dynamics. One is drama, introduced by J. M. Thompson in his article ‘Defining the Abstract’ [1], which is connected to the ability to recover from a weaker position. This article proposes several criteria to measure drama in the context of race games, specifically for several historical and modern variants of the traditional game of Snakes & Ladders (known as ‘Chutes and Ladders’ in the USA). Given the probabilistic nature of race games, these criteria are measured by simulating millions of matches and statistically analysing the results. The article includes a discussion of this analysis. This methodology can be used to measure drama in other board games with strong random elements, and can thus be a useful tool in game design.*

## 1 Introduction

EVERY board game player has preferences, finding some games more appealing than others. What makes a game successful is not completely clear. Even among 100% random games, some seem more attractive than others. This raised a natural question: among games in which players only throw dice and move their pieces accordingly, what makes some of these games more interesting than others?

*Drama* seems to be the right answer. This concept, introduced by Thompson [1] in the context of abstract games, has been adapted by the present authors to some race games in [2]. The present article contains our effort to assess how much drama we find in various forms of the traditional game Snakes & Ladders. Figure 1 shows an Indian set from the 19<sup>th</sup> century.

Mathematical methods have been applied to race games. Markov chains were used by Daykin [3] and Althoen [4] to estimate the length of a typical Snakes & Ladders game. Seville [5] used Monte Carlo and Markov chain methods to study the playful character of Snakes & Ladders and the Game of Goose.<sup>1</sup>

## 2 The Games

Snakes & Ladders is a traditional board game of Indian origin. Players randomly move along a track on a board which traditionally represents a personal spiritual path. The path is normally along a square grid, with some ladders and snakes connecting non-adjacent pairs of squares, marking promotions and demotions. In traditional versions, the cells are inscribed with text.<sup>2</sup>

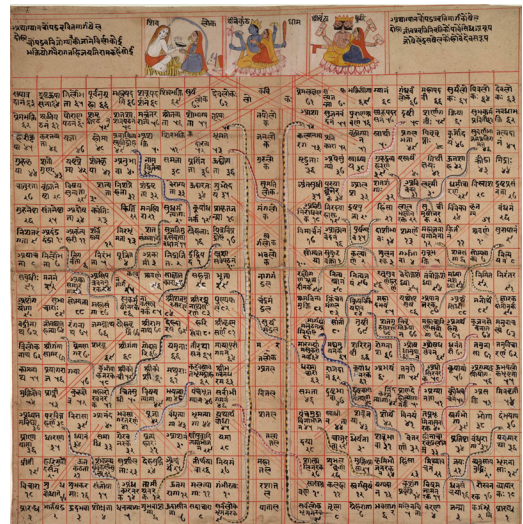


Figure 1. Snakes and Ladders. Photo © Trustees of the British Museum.

According to Topsisfield [7, 8, 9], some versions of Snakes & Ladders – namely Jain, Hindu and Muslim – were played in India during the 18<sup>th</sup> and 19<sup>th</sup> centuries, and are believed to be several centuries older. This family of games evolved from previous versions, adapting its didactic mission and perhaps becoming more playable.

Although the number of cells may range from 72 to several hundred, most variants have similarly structured rectangular boards. This article studies six historically significant variants of Snakes & Ladders. Figure 2 shows a modern Milton Bradley edition with 100 squares, similar to a 1943 edition studied by Althoen [4].

<sup>1</sup><http://www.giochidelloca.it/>

<sup>2</sup>Similar forward and backward loops were already present in the game Fifty-Eight Holes from the second millennium BC, and can be found even in the modern Monopoly (see [6, p. 59]).