Dice Design Deserves Discourse

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Dice are not just game components. Their aesthetic design can influence a player's emotions as well as speed in accurately reading the dice results. In order to examine the factors which positively contribute to a player's experience, a set of fifty players were tested with dice categorised by four criteria: numeral type (digits, pips, symbols), colour, shape and size. We explored players' subjective preferences among the various dice, as well as objectively measuring the time needed to perceive and mentally process the results of the dice. The tests discovered a disconnection between a player's subjective feeling of which die is 'best' and the objective time needed for a player to understand the die result.

1 Introduction

DICE have a long history of use not only in games but in religious divination and other mystical and psychological activities, appearing in a variety of physical materials (stone, bone, ivory, wood, plastic, etc.) and forms. Many people still have superstitions about 'lucky' dice and firmly entrenched rituals about how to resolve a misrolled die (cocked, out of the dice tray, off the table, etc.). Many board games include dice with custom art on the faces or unusual colours.

There is little standardisation in the physical design of dice beyond the realm of gambling, in which standards are necessary to satisfy legal requirements and to ensure fairness (and of course even in casinos dice are a frequent object of superstition and emotion). Dice are evidently more than a mere practical mechanical randomisation tool, all the more so in the modern world where digital forms of randomness are often more accessible, cheaper, and better suited to the task of producing stochasticity. Note that as we are more interested in the players' perception of the dice for the purposes of this study, we ignore issues related to dice fairness.

The design of dice clearly serves an emotional role in addition to a functional role. Norman [1] examines the design of many objects for both their functional and non-functional characteristics. His anecdotal findings are that there is a disconnection between objects which are functional and those which users enjoy, and that emotion often takes precedence over usefulness in purchasing decisions. In designing introductory board games, Steenson states:

> *A good gateway game should last somewhere between 45 and 90 minutes. A game that takes longer may lose newer players, while anything shorter than 30 minutes may leave its players feeling like their purchase was not a good value.* [2]

In addition, Nephew advises:

> *make sure [the board game] has as little downtime as possible.* [3]

This implies that a useful die allows for faster game-play. However, our hypothesis is that other factors of the design besides efficiency will influence the users.

In this study, a set of seven dice were tested for their usability in a simple game with fifty users. The goal was to determine which of the design characteristics have an effect on their choice of the most functional die, which we define to be the one which requires the least time from the roll to making a move in the game. In this study, we investigate whether the most objectively usable die is the die which users prefer.

2 Methodology

In order to investigate this question, we conducted the series of experiments outlined below, using students of Innopolis University as subjects.

2.1 Experimental Design

Tests were conducted during two days in a meeting room with two chairs and a glass table. In order to examine different dice from the user perspective, two participants played each other in a game of modified *Knock Out*[1] Each player selects and announces their own 'knockout number' from 1 to 6.

[1] https://icebreakerideas.com/dice-games/