**Game Theory: Variance and Seat Position**

When Dwight D. Eisenhower was a young officer in the Army, he played a lot of poker. Poker is a game where bluffing sometimes is mandatory for success. It is also a high variance game. In Texas Hold Em for example, any two starting cards can win. Even the best starting hand, two aces, is only an 85% favorite to win in a two-player game. The future General Eisenhower must have learned something from poker since his future war plans always had several well-planned elements of deception. He even left General Patton back in England on D-Day, assembled fake divisions with artists manning rubber tanks, and had parachute drops behind the front lines with dummies to convince the opposition to allocate resources to non-existent threats.

In playing board games, deceptive strategies can frequently lead to more success. Moving units out into a position where they can’t win, but are a threat to do so may lead to better results. Consequently, games with high variance on potential strength or results can lead to uncertain results depending upon the perceived strength of the action or the willingness of the opponents to believe the action. Conversely, games with no unknown elements are predictable on the outcome of each conflict. In such games, players that are behind will take more chances, while players that are ahead will be more reluctant to make moves that are statistically unsafe.

Seat position is an important factor in many games. In games where the order of the players is fixed, having a weaker player playing in front of you is an advantage, while playing behind a stronger player limits the good options available and can be quite detrimental to your chances of doing well in the game. I prefer games where the turn order changes during the course of the game, as opposed to the constant rotation of play around a player circle. An example is where the next player turn order is dependent upon the pass order of the previous turn. Good game design also can allow for more variance by having a large number of cards in a draw deck that require some real-time changes to the strategy used.

I have attempted to evaluate some board games on the basis of probability of a competent first-time player winning the game. I will assume that this player has had some gaming experience, has read the rules, and looked at some professional advice on internet gaming sites. My chosen scale is from 0 to 10, where 10 means that the beginning player has no chance of winning as in chess or go, while the 0 means that all players have an approximately equal chance of winning since the game has a high variance on results. The variance can occur due to the rules, card draws, or a dice rolls. However, a multitude of decisions over the game length such as in several older games with many dice rolls leads to higher probability of the better player being successful. Games with scores of 0 (random) or 10 (all skill) are not much fun and are excluded from the rankings. I have attempted to include popular games from Board Game Geek or games that I like. The following opinions are my own and I would expect that experienced game players will have different rankings.

9- Le Havre (random deck is weak, seat position matters), Victory in the Pacific (so many dice rolls)

8- Splendor (takes some game experience), Power Grid (draw dependent), Terra Mystica (practice needed)

7-Agricola (there are many expansion decks), Empire Builder (know where to draw), Dominion

6- Caylus (better have a strategy), Puerto Rico (experience counts, who is playing?), Thurn and Taxis

5- Scythe (five decks of draw cards, bluff opportunities), Carcassone (draw good tiles)

4- Terraforming Mars (huge variety of cards, green is best), Acquire (be first to merge), Race for the Galaxy

3- TicketToRide (knowing when to draw new cards is key, can get blocked), Lords of the Waterdeep (buildings)

2- Seven Wonders (avoid black cards, look for green cards, seat position, role), Five Tribes (defense!)

1-10 Days in Africa/Asia/ Europe/USA (be lucky, arrange well), Kingsburg (roll the 17), Stone Age (dice)

Another way of determining the randomness of a game is to examine the results of the national tournaments. If the same player wins consistently, then the game has less randomness. The large national Texas Holdem poker tournaments have had mostly different finalists each year and therefore can be evaluated as high variance game. Strangely, the finalists have mostly been male and in their 20’s. The board games that have a high ranking in my list seem to have the same players in the finals every year. However, this attribute could also be caused by the same small group of really good players showing up at the tournament each year, and therefore knowing how the other players will play in the game.