Chapter 1:

Entropy

"The goal is to win the game." This motto is commonplace in locker rooms and press conferences around the world. It's said so often that it's lost its meaning: but for coaches, managers, and other decision makers, this slogan has far-reaching ramifications. Sports are not just about scoring as much as you can: it's all also about managing risk.

When behind, players and teams need to take risks and become more aggressive, often bordering on the edge of recklessness. Football teams start to "go for it" on fourth down, while basketball teams shoot more three-point baskets, and baseball teams attempt to steal more bases, creating some of the most exciting moments in sports history.

When ahead, players and teams need to minimize risks and play more conservatively. In sports, this happens frequently to the chagrin of many fans who don't want to "take their foot off the gas". When leading, fighters are more defensive, teams stall the game, and fewer risks are taken. You shouldn't try a fake punt or a double steal when you're ahead: *even if you think it will work*. The reward isn't worth the risk. Even though it might be "boring", it's the right thing to do if you want to win the game.

This same approach is also important if you want to win at games such as Scrabble. While maximizing scoring is important, it's also necessary to control risk: taking extreme risks when behind to try and catch up, and minimizing risks by playing more defensively and stalling when ahead.

The metric describing the propensity of the score to change is called *entropy*. Scrabble positions with high entropy are chaotic and uncertain: a lucky tile draw can easily change the entire game. Positions with a low entropy are stable and predictable: it is unlikely that either player can significantly outscore their opponent.

Trailing players try to increase entropy by playing bingos and encouraging high-scoring plays. They frequently sacrifice points in hopes of drawing a bingo. They need the unpredictable nature of Scrabble to take over, and want good bingo tiles and open bingo lines to swing the game in their favor.

Leading players want to retain their lead using consistent scoring. They rarely sacrifice points, but they will do so to open hotspots, hoping to score 25-40 points every turn and keep balanced leaves to score well on future turns. While the trailing player takes big risks (such as fishing) to score touchdowns, the leading player is content kicking field goals.

Chapter 2:

Endgame

"What's the best play?" This is the question that aspiring Scrabble masters should ask themselves before every play. By learning strategy, we develop rules, heuristics, and ideas that help us make decisions, but in reality we can't ever find the best play: we're just making an educated guess.

This is because of the uncertainty implicit within Scrabble. Scrabble is a game of incomplete information: we don't know the tiles remaining in the bag, the tiles on our opponent's rack, or the order of tiles that are yet to be drawn. Without that information, optimal Scrabble play will always be a pipe dream. Even the strongest computer or the smartest player will never know for certain what the best play is on the opening rack.

However, when the bag is empty and we enter the endgame, we can now *prove* which play is best. During the endgame, we have all the information we need: it's our tiles vs. our opponent's tiles. This allows us to make more informed decisions about our plays. It allows us to achieve the elusive goal of all Scrabble players: to play *optimally*.

The endgame requires you to use very different heuristics, looking at Scrabble in a whole new light. It requires an iterative "if...then..." reasoning that is very different than other turns. Because you know your opponent's tiles, you can prove one play is better than another by figuring out the resulting plays made by both players, 'solving' the endgame using a process called *forward induction*.

Forward induction is like being in a labyrinth, searching for the maze's end. While you have some idea of the correct *route*, you must try a bunch of different routes until you reach the end. If one route does not win, you must retrace your steps back to the beginning and try a different route.

Solving a maze in this way is similar to solving a Scrabble endgame. Endgames are solved by arbitrarily selecting a play and analyzing how that play performs against various opponents' responses. If one play loses, you must pick another until you find a play that wins you the game regardless of your opponent's play. By investigating each option and evaluating every plausible path, you can eventually find the optimal play.

Chapter 3:

Pre-endgame

As we learned in the previous chapter, the endgame requires a different approach from the rest of Scrabble: playing not only with your tiles but also with your opponent's tiles if you want to make the best play. But what about when there's one tile in the bag? In a way, you can think of this as playing 8 endgames simultaneously: one endgame for each tile that you might draw. And then of course, what about two tiles in the bag?

The pre-endgame begins when there are less than 14 tiles remaining in the bag. At this point, you have some information about your opponent's rack: certainly more than you did at the beginning of the game, but you still don't know your opponent's exact plays. At this point in the game, you need to combine the logic of the endgame with the heuristics that you use in the early game. Pre-endgame strategy requires thinking both heuristically and iteratively.

Pre-endgames can be thought of as more complicated endgames. They require finding specific threats in the tile pool: figuring out what high scoring plays both you and your opponent could draw (or already have) and reacting to those possibilities as best as you can. When one player as a lead, you are often looking for specific draws that can change the game: as the trailer you want to draw those tiles, while as the leader you want to survive the bad draw and hold on to win regardless.

However, since you don't know your opponent's tiles, the pre-endgame also requires some heuristics, especially in games that are close in game score. Themes such as entropy, endgame timing, fishing, and setups need to be combined with an awareness of the specific situation to form subgoals that will allow you to win the game.

Chapter 4:

Bingo Defense

Many players treat Scrabble like a game of golf --- as a one-player contest to see which player can outscore the other. They feel that Scrabble is a race, and by maximizing their point total, they maximize their winning chances. To some degree, they're right: if you can score enough points, you can be like the road runner, scrambling past the coyote.

However, most sports or games don't work like golf; they feature *defense* as a critical component. Although defense doesn't result in many highlights, home runs, or slam dunks, defense *wins*. While scoring is obviously important, you also have a thinking, competent opponent. Scrabble is a *competitive* game. Sometimes it works better to slow your opponent down instead of trying to sprint past them.

One of the most frustrating components of Scrabble is having a bingo without a spot. Some players feel that blocking bingo lines is "unfair" and makes Scrabble less fun. However, limiting your opponent's ability to play bingo is a vital part of Scrabble strategy. While high-scoring games may be fun, Scrabble champions find it more fun when they are doing all of the scoring.

Bingo defense is especially important if you are ahead of your opponent. When a player is behind by more than 50 points, they often need to play a bingo to overtake their opponent. Hotspot plays usually don't score enough points to win: a bingo is needed to overtake such a deficit. Trailing players will often need to open bingo lines.

While you should normally open bingo lines when behind and close them when ahead, there are other factors you must consider. Decisions about blocking bingo lines depend on the score, leave type, the amount of points and/or leave sacrificed, and your ability to impede bingo lines. This chapter will focus on taking all of these factors into account.

Chapter 5:

Scoring Spots

Bingos are the flash and glitz of Scrabble. Like a touchdown in football or a home run in baseball, bingos excite spectators and can change the psychology of the match in one fell swoop. However, bingos aren't the only important plays. While those plays make the highlight reels, the walks and 11-yard passing plays make or break most sports competitions.

Likewise, in Scrabble, most games aren't decided by bingos. At the highest levels, Scrabble results are decided by plays that occupy hotspots while depriving your opponent of easy points with clunky tiles. This allows you to maximize tiles such as the P, W, and Y while inhibiting your opponent from doing the same. Over the course of the game, these small decisions make all the difference.

In the previous chapter, we proposed a basic lemma: create bingo lines when behind and close bingo lines when ahead. You might think the same rule applies to scoring spots, but this is not the case. Scoring spots are actually good for the leader, since they are a reliable source of points, as opposed to the hit-or-miss nature of bingo lines. Leading players want to create scoring spots (as long as they can't be played for 50 or more points easily) while trailing players want to make the board a bingo-or-nothing proposition, encouraging large swings.

Since scoring spots are always beneficial for the leader and always favor the person who did not create them (opponent gets first crack) you might think that players should never open scoring spots and should close them whenever possible. However, opening scoring spots can sometimes be beneficial. Whether or not you should open or close scoring spots depends on your leave, the board, the score, your opponent's previous plays, and entropy. This chapter will explain when to create and block scoring spots, showing you how to win the fight for points within the trenches of Scrabble.

Chapter 6:

Closed Board Dynamics

Many players get a rush from Scrabble's unpredictable nature. When asked what they love about Scrabble, many avid players respond: "Every game is different, and no two games are ever alike...". Big leads can disappear quickly, and the board can change from gridlock to wide open in just a few turns.

However, masters can harness what others find unpredictable. They can create open and closed boards at will, approaching Scrabble as not just a word game, but as a board game. While an open board forces you to find words, a closed board forces you to *understand the game,* using your skill to manipulate the board.

These players focus on the patterns of Scrabble: the similarities of various positions and develop themes that they can apply universally, allowing them to make better plays and subsequently win more often. Navigating a closed board takes practice until you can manipulate boards like a musician wields his instrument.

One pattern that Scrabble masters observe is board shape: figuring out which positions constitute open and closed boards. They can look ahead a few turns and implement a board shape to their liking, and can take preemptive measures to ensure the board is as open or closed as they want it to be.

This type of long term board control can be understood through *board dynamics*. Board dynamics views Scrabble through the lens of space and quadrants rather than individual bingo lines. The next two chapters implement board dynamics and show you how to shape the board based on your desired entropy.

This chapter will also describe specific board shapes that result in closed boards. Learning these shapes will help you quickly identify various board altering tactics commonly used by the best players in the world. By using board dynamics, you can tactically control the board, allowing you to influence the board's shape.

Once boards are closed, they tend to stay that way for quite a while. This is good news for players who can manipulate the board: often you have defensive interests that last more than just one turn: when you are ahead by 50, you often want to limit your opponent's bingo chances, not just for next turn, but for the game's entire duration.

Chapter 7:

Open Board Dynamics

Most Scrabble players prefer to play open boards instead of closed boards. After all, most players get into Scrabble because they like the word game elements, and open board Scrabble focuses on those elements. On open boards, the most important skills are anagramming and word finding: consistently finding bingos and high-scoring plays become absolutely essential. While strategic decisions still need to be made, open board Scrabble is mostly about finding the best scoring play possible.

Opening the board is a necessity when you are behind and need a bingo to win. Although you can overcome small leads on closed boards with high-point scoring tiles, leads of 60+ points usually require a bingo to overcome.

Many players wait until no bingo lines are available to open the board. However, once the board is at this point, it is difficult to reopen. If you want an open board, you must act preemptively. When you sense the board is in imminent danger, you must take action to create and preserve bingo lines.

Understanding how to open the board is very important. Opening the board is not as simple as creating a bingo line, but requires accurately predicting and accounting for our opponent's responses. Effective board opening plays create several different bingo opportunities that cannot be shut down simultaneously. Often, creating an open board requires taking risks, increasing entropy and sacrificing points. Opening the board isn't necessarily about creating bingo lines for next turn: it's also about creating bingo lines for future turns when your rack improves.

Some players become reckless when they open the board. They don't open the board in a smart way: they forget to take their opponent's response into account. As a result, they gift their opponent a free opportunity to make a high scoring play while closing the board. While opening the board is important, opening the board carelessly is often worse than not opening the board at all.

In the previous chapter, you learned several board dynamics that lead to closed boards. However, there are also several board dynamics that also lead to open boards. By creating certain board shapes, you can create openings that are difficult to close down. Games between skilled players are cat-and-mouse games where both players use board dynamics and battle over the shape of the board.

Chapter 8:

Advanced Decision Making

One of the most overlooked parts of Scrabble is decision making. While many players spend countless hours learning words and becoming consistent at word finding, few players spend much time or effort honing their ability to figure out the best play. Decision making is not easy: it requires weighing many factors against each other to determine which play is best. Assessing each factor can prove to be quite the challenge.

While making decisions, there are two important parts: the primary stage and the selection stage. The primary stage is where you decide between similar plays using strict logic, while the selection stage is where you decide between plays with different strengths and weaknesses, based on preferences.

But how do you decide on those preferences? Preferences should not be made based on whimsy: they should be evaluated based on logic and analysis. Because of this, it is helpful to introduce a third stage of decision making called the *assessment stage*. The assessment stage occurs before the primary stage and identifies your goals based on the score, your leave, and the state of the board.

The assessment stage ensures that every play you make serves a purpose. Every decision you make should accomplish some goal (with a reason behind that goal) whether it's to outscore your opponent's potential bingo, try to increase entropy since you're behind, block an opponent's likely bingo when you suspect a strong leave, block hotspots since the pool consists of many high point tiles, etc.

In some positions, the assessment stage will be straightforward: your goal will be as simple as maximizing score over the next few turns or blocking the last bingo line. In other positions, the assessment stage will be more complex, as you will face many different score, leave, and board situations that may lead to goals that seem contradictory.

Over the course of the book, the assessment stage will become more complex. However, the process of making decisions is still the same: figure out your goals, compare and contrast similar plays, then make a selection.

To gain the most out of this chapter, you should look at each position and figure out what you would play before reading the analysis. This will help you critique your thought process so you can refine the way you make decisions over the board.

Chapter 9:

Inferring Leaves

Many Scrabble skills can be easily compared to other popular games. While the comparison to other word games is obvious, and the comparison to other board games (such as go or chess) makes sense when you compare board dynamics, Scrabble also shares something in common with a seemingly surprising relative: poker.

In poker, one of the main objectives is to decipher your opponent's cards based on their previous betting patterns. Several pieces of information are used in this mission, including their physical tics, betting amounts, and the way that they've played previous hands. Using this information, people try to narrow down a group of hands their opponent might hold in a process called *range finding*. The goal of range finding is to find a group of possible hands (a range) that your opponent could have (including bluffs) such that their actions make sense, given rational behavior and/or history. Given this information, players then decide whether or not to call their opponent.

A very similar action occurs in Scrabble, albeit with a different goal: players try to figure out their opponent's leaves given their prior play. This is useful information, as it allows players to figure out which spots to block and which spots to leave open. Unlike poker, in Scrabble the challenge is made more complex by the fact that players draw new tiles. However, when executed correctly, you can often prevent your opponent from scoring well using information about their rack acquired from their previous plays.

Range finding obtains information about your opponent's leave by assuming that your opponent's last play is optimal and using that assumption to deduce which tiles your opponent likely does and does not have. Positive leave inference deduces what tiles your opponent has on their rack, while negative leave inference deduces what tiles are *not* on your opponent's rack.

With this information, you can make setups or block the board as necessary. Range finding allows you to exploit bad leaves or protect against strong leaves. The effectiveness of range finding depends on your opponent's skill level, as it is easier to draw information from stronger opponents since they have a more consistent thought process and are less likely to miss plays.

Chapter 10:

Play Your Opponent

So far, this book has discussed many factors involved in play selection including score, leave, defense, entropy, and others. However, there is one factor that has not yet been discussed: your opponent.

Far too many people treat Scrabble as a solitaire of sorts: after all, you can't see your opponent's tiles, and you can only affect your opponent's play so much, so why not stay focused on your own game? "Taking advantage of opponent weakness doesn't work in the long run, and diverts attention from the task at hand," they argue. "Making a play based on your opponent means that you're playing suboptimally."

This attitude fails to take into account the human side of Scrabble: players have tendencies and habits that should be taken into account. Tailoring your strategy to your opponent can pay huge dividends. Players play extremely well in their comfort zone: on boards that play to their strengths, or in situations where they know what to do. But when you give your opponent something they've never seen before, they not only make strategic mistakes, but they often miss plays they would ordinarily find.

Some people will always criticize this approach. Indeed, taking advantage of your opponent is an uncomfortable topic for many people: no one wants to think of opponents as variables that we try to manipulate and exploit: our opponents are friends who enhance our enjoyment of Scrabble. Relationships with your opponents can transcend Scrabble and branch out into your everyday life.

Nevertheless, at the end of the day, they are still your opponents: adversaries you are competing against. And as much as you enjoy their company, you still want to *beat* them. Doing so requires more than simply evaluating the factors over the board: it also means evaluating your opponent's beliefs and decisions.

Making these evaluations can be both difficult and sensitive. It's not fun to make judgments about other people, and it's not fun when other people make judgments about you. No one wants to be thought of as cannon fodder for stronger opponents, and thus many people don't like to judge others in this way either. However, making these judgments will help you win games more often.

Chapter 11:

Adjustments

So far, this book has provided many guidelines on how to play strategic Scrabble. These guidelines have been used to evaluate concepts such as tile equity, entropy, bingo defense, and scoring defense. However, these guidelines are *general* rules. Scrabble is a dynamic game filled with unique situations. You can't master Scrabble by applying general concepts to every position, because sometimes these general rules fail. You need to know how to *adjust*.

Throughout this book, we've assigned numerical values to various leave and board metrics. However, both leave and board position cannot be quantified so generally: tile values, leave values, bingo lines, and scoring spots all change depending on the score, pool, board dynamics, scoring spots, and bingo lines present in each specific situation. Often, these leave and board quantities need to be altered; customized to the unique qualities of your specific position.

Some of these adjustments are quite intuitive. A leave like ER is strong on an open board but weak when few bingo lines are available. A potential S hook on column o is extremely dangerous on an otherwise closed board, but quite innocuous on a wide open board, depending on the number of 'S' tiles remaining in the pool. Learning how to adjust these values to the situation is critical for your Scrabble success.

Adjusting for all of these factors is quite complex, and fine tuning these adjustments hoping to find a harmony between these factors comes largely with practice. Some players don't adjust enough for the sake of simplicity, while other players overadjust and make strategically complex plays when a simple play would suffice. Learning to find the middle ground is critical: at first, it is easy to oscillate between these two extremes. This chapter serves as a starting point to find this harmony.

Chapter 12:

Positions

       While this book has explained the concepts necessary for top Scrabble play, a conceptual understanding is not good enough. To become a Scrabble Master, you must also correctly *apply* these concepts. Lessons are never truly learned until they are put into practice.

       Chapter 8 explained the fundamental decision-making process using simplistic metrics such as points, leave, and board during the primary and secondary stage, allowing you to account for other, more nuanced tactics such as entropy, defense, board dynamics, and preendgame during the assessment stage.

       Since then, you've acquired additional advanced skills such as leave implication, opponent exploitation, and other subtle adjustments that you will need to make over the course of the game. While intuitive, these skills are often difficult to apply and quantify over the course of the game. As such, it is crucial to practice using these tactics until you develop a situational awareness of how and when to attack.

       At this point, it should be obvious why a methodical decision-making process is needed. Scrabble is a complex game requiring many skills. Many positions have several moves worth considering. Without careful analysis, making good decisions while considering all of these skills will prove nearly impossible.

       This is your final challenge of this book. To gain the most out of this chapter, please look at each position and figure out your play before continuing the analysis. This will ensure you get the most you can out of this chapter: it will help you examine your thought process so you can refine the way you make decisions.