Characteristics of Professional Poker Players

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Introduction

Poker nowadays is everywhere; on television, in pubs, in casinos and at home. To many people, poker is a hobby which will sometimes yield some profit, but most of the time will cost them money. However, there is a small percentage of poker players that seems to win every time they play. Some of them win enough each month to secure a living out of poker.

The game of poker can be divided into two groups twice, and as a result one can identify four different types of poker players. First, there is the distinction between live poker (poker in casino's or at home with friends) and online poker. Second, there is a difference between cash game poker (poker with money on the table) and tournament poker (a knockout competition).

Combined, this results in live cash game players, live tournament players, online cash game players and online tournament players. Large amounts of money can be won and lost in all of the four formats, as players have won millions of dollars in all the four disciplines. The focus of this thesis however, will be on the online cash game format, since this is the most interesting one in the author's opinion.

In 2005 an estimated $60 billion was spent on online poker worldwide (Smith, 2006). Different from classic casino games such as roulette and blackjack, poker is not played against the house, but against other players. The house only provides the interaction between the players and is rewarded with a small percentage of the pot. This percentage is called 'rake' and is online usually five percent with a cap of $3 per pot. This means that more than 95 percent of the money spend on online poker is being redistributed between the players. Also in the Netherlands, poker has infiltrated the lives of people. The Dutch poker union estimates that in the Netherlands around 1 million people play poker; 150.000 of them play regularly and 800.000 play less frequently (Paulen et al, 2007). The Dutch poker union expects these numbers to keep growing.

Pokertableratings.com and Highstakesdb.com are websites that collect the results of people that play cash game poker online. If one would search on these websites for names as 'Durrrr', 'Phil Ivey' or 'OMGClaiyAiken' one would see that each of these players have won over $5 million playing poker online in the last three years. Furthermore, one can find hundreds of players that have won amounts from $50.000 to $300.000 in online poker. Since poker is a zero sum game, it implies that there must also be players that have lost these amounts of money. It seems that there are not many players that spend and lose enormous

amounts of money online. This implies that there must be a large number of players that spend and lose smaller amounts in online poker in order to reach the earlier mentioned $60 billion. In other words; many small fishes pay the winnings of a rather small group of sharks.

Why is it that the large majority of the online poker players lose money and only a small group wins? This inequality in poker cannot be explained by just plain luck, since this would result in a more even distribution of winners and losers.

This paper catches elementary aspects which distinguish professional (online) poker players from recreational players. What is it that makes certain players better at poker then others and what circumstances do they have to take into account in order to stay successful? In particular, it analyses which characteristics and qualities identify professional poker players. These characteristics and qualities might be useful in other careers, away from professional poker.

The main research question therefore will be:

What characteristics and qualities distinguish online poker professionals from recreational players?

This main research question is divided into three sub questions, which all cover different aspects of being a professional poker player:

- Different aspects of the game of poker; (i) what variant of poker do professional players prefer, (ii) how many tables do they play simultaneously, and (iii) how many hours a week they spend on playing poker.
- Poker knowledge and technology; (i) do professional poker players have enough basic statistical knowledge of the game of poker in order to be successful, (ii) do they use supporting software and instruction video websites, (iii) do they practice table selection and bankroll management, and (iv) how do they value rakeback and bonuses.
- Personal characteristics; (i) how do professional poker players combine their personal relationships with poker, (ii) do they lack education, (iii) what is their attitude towards sports, and (iv) how do they feel about being a professional poker player.

This paper consists of three parts. The first part is an overview of the poker industry and all the aspects of playing professional poker that might distinguish professional poker players from recreational players. The second part is a survey which provides the data on how

professional and recreational players react to some of the aspects described in part one. The third part covers the results of the survey.

Results show that professional online poker players posses explicit characteristics and qualities such as; analytical ability, dedication, willingness to develop and mental toughness, which are important to recognize as they can also be of great value to employers in other work segments besides poker. Professional poker players however have no evidence to prove their qualities and that is what this paper aims to provide.

Section I

The poker industry

Basic knowledge of the game of poker is assumed by the readers in order to understand what is written. If the reader feels that he/she is lacking knowledge of the game, the book The Poker Player's Bible by Krieger (2004) is highly recommended as it is an excellent book when it comes to covering the most basic understandings of the poker game concerning game rules, game variations and some mathematical explanations. Furthermore is there a glossary included in this paper where some of the more technical concepts of poker are briefly explained.

In the movie Rounders (1998), a young Matt Damon is forced to play poker against one of the biggest criminals in town in order to safe his own life. After picking up a tell from his opponent he manages to succeed and even win more money then he owned the criminal. In the 2006 James Bond movie Casino Royale, Bond has to play a big poker game in order to save the entire world from falling in the hands of a terrorist organization. What follows is a game of poker in which some of the most implausible hands in poker tangle up and Bond ends up saving the world by winning the poker tournament.

The different aspects of the game of poker

At least once every three months a message is placed on the online poker forum Pokerinfo.nl by a person that wants to play poker in a professional way. Most posts start in somewhat the same way: "So, I quit my job/dropped out of my study and have decided to become a professional poker player." Posts like these always bring hilarity to the forum as they show the short sightedness and lack of consideration of many people when it comes to playing (professional) poker. People see a poker player win a big tournament on TV and decide that this is the way they want to make their money, not considering all facets that come with the game of poker.

<u>What is poker?</u>

Poker is not just one game. It is really a group of related games that have a number of common elements. Poker has been described as a game of money played with cards, and that is more truer than one might realize at first glance. If money would not be a major element in

this game, poker would not be a test of will and skill, and it is the element of money that makes poker the exciting game that it is (Krieger, 2004).

Poker is a card game in which players try to win the money that is put in the pot by all the players. Every player is dealt cards which, depending on the variation of poker, can either be private, open or shared. Players try to make the highest combination of cards, ranking from a high card till the famous royal flush, in order to defeat the combinations of the other players.

Winning in poker can be done in only two ways. First, there is the possibility of showing the strongest hand and thereby defeating the weaker hands of the opponents. Second, there is the possibility that by betting or raising a player can make all of his opponents lay down their hands and win the pot uncontested. Poker is played against other persons that do not follow rigid patterns as, for example, the house does in blackjack. This makes poker a game of interaction, deception and strategy and the possibilities are infinite.

Live and online poker

At first glance, live poker and online are not that different from each other; the rules are to a large extend the same and statistics and chances do not differ either. However there are some differences concerning ethics-, aggressiveness- and speed of the game.

Seeing mucked cards (cards your opponent lays down) is different in live and online poker. "In a live game, you might like to know your opponent's hand, so you can learn more about his style of play, but asking to see the losing hand is usually considered a breach of etiquette" (Greenstein, 2005). Whereas in online poker one only has to click on the 'request hand history' button to see the opponent's mucked hand.

Aggressiveness in style of play usually differs a great amount between live poker and online poker. Live games are considered much less aggressive in style of play than online games (Pokersite.org).

Brunson (2005) discusses why someone would prefer live poker or online poker. In live poker one can use physical tells that opponents might give away when faced with a tough decision. In online poker this ability does not exist since one cannot physically see ones opponent.

An other reason why a player could favor live poker is that when winning in live poker one can immediately spend the money one has won, whereas in online poker the money is at first only digital and a payout request is needed, which takes several days.

Brunson clearly looks at poker in a professional way, but most of the poker players are just recreational players and therefore have other priorities when it comes to poker. One could

argue that recreational players tend to favor live poker over online poker, since live poker gives them a chance to chat up with the other players at the table and have some drinks, which all makes it a more enjoyable experience.

Brunson provides five reasons why online poker is to prefer over live poker: 1). The fact that there is always a game waiting for you to join online. No matter what time it is, there are always other players online to play against. 2). Online, more hands per hour can be played since shuffling cards, dealing a hand and betting chips happens significantly faster online compared to live poker. 3). Online one can play multiple games at the same time, whereas in live poker one can only play at one table at once. 4). There is also a cost reduction argument; in online poker the rake percentage is usually lower compared to live poker. Furthermore it is a custom to tip the dealer when you win a pot in live poker. 5). The last comment Brunson makes is that, when playing online, there is no social stigma about leaving a game early with your winnings. In live games it is sometimes hard to leave a game after winning a large amount of money; other players at the table feel that they should have the chance to win their money back and thus do not want you to leave. Online a simple click on the mouse button is sufficient to leave a table.

Cash game and tournament poker

There are some important differences between live poker and online poker that makes them two different disciplines in poker.

In a cash game players play directly for money, the betting at the table happens with cash or chips that represent cash value. In tournament poker, every player who joins the tournament puts down the same amount of money and in exchange receives the same amount of tournament points in tournament chips. A tournament has a preset start time and usually starts with the number of players that have registered at the time.

When playing in a cash game a player is allowed to bring more money to the table and make a rebuy in the case he were to lose all his money, whereas a poker tournament a knockout competition is; if a player loses his last chip he has to leave the table/tournament.

An other big difference between cash games and tournaments is the fact that in cash games the stakes are fixed and do not change over time. In tournaments the stakes increase periodically, which leads to a declining M (ratio of ones stack value to the value of the current big blind) and asks for different styles of play during the tournament (Harrington and Robertie, 2004).

A last important difference between cash games and tournament poker can be found in the way money is won in both disciplines. In cash games winnings and loses are, in general, smaller if compared to the money brought to table then in tournament poker. In tournament poker, in general, ones lose is never bigger then the original buy in for the tournament, but the winnings go from roughly two times the buy in till 1000 times the buy in, depending on the number of tournament entrants. In tournaments however, approximately only the top 10% finishers in the tournament get paid, the rest loses their buy in. In a cash game session, winners and losers are usually more equally distributed. The variance in winning is higher in tournament poker then in cash game poker, as the winnings of a cash game poker professional are more smoothed out over a period of time and are therefore more suitable to acknowledge if someone is a sustainable winning poker player.

<u>Poker variations</u>

It is assumed that the no limit Texas hold'em variant of poker is the most commonly played poker form and that is why Brunson (2002) calls it The Cadillac of poker.

Krieger (2004) stated that poker isn't just one game. It's really a group of related games that have a number of common elements. Some of the better known poker variations are 5 card draw, 7 card stud, limit Texas hold'em, no limit Texas hold'em and pot limit Omaha. The poker game one usually sees in western movies is the perhaps oldest version of poker; 5 card draw. However, nowadays this version of poker is merely played at kitchen tables.

A professional poker player makes a living out of poker, but since poker consists of so many variations the question arises whether a professional players is better of mastering one type of poker game or if general knowledge of several games is the way to go.

This dilemma is treated by Zolotow (2005). He claims that in order to master all the different poker variations a players needs at least five lifetimes and since no-one has that amount of time every player is faced with the question; should he specialize in one particular poker variant of should he try to learn them all as well as possible? The advantage of specialization is that one could become real good at one form of poker. The question arises why someone would even consider to learn a variety of games, especially if it is virtually impossible to master multiple games? Zolotow provides five reasons: 1). Times change and so does poker. The poker variation one has specialized in might not stay popular forever, and once the game one specialized in dries up, so does the income. 2). Adaptability means higher profits. Being able to play multiple games gives players the option to choose the weakest, and

therefore the most profitable, tables. 3). Knowing more never hurts. This universal wisdom also applies to poker, extra knowledge always makes someone a better player. 4). Flexibility. If a player has mastered several games, he/she is able to participate in so-called 'mixed games'. In mixed games the game changes after a set of hands is played or a certain amount of time elapses. 5). Versatility. A versatile player is much better prepared for new games that might develop in the future and will pick up on the essence quicker than others, which will give them a head start in the learning process.

Zolotow concludes that in order to make the most money, a professional poker player should master one or two games, while achieving high competence in the others.

Stakes, number of tables and time

Poker can be played for pennies but sometimes millions of dollars change hands. In between there is a wide spectrum of stakes at which people play poker. In casinos the games usually start from blinds at $1/2 or €1/2 to $10/20 or €10/20, depending on the currency used in the casino. Online games start as low as $1/2c and at most sites go up to at least $25/50. Higher limits however are played both in casinos and online.

Online poker players can be judged by their winrate. This winrate is comparable to the betting percentage of a baseball player or the yield of a stock. In online cash game poker a player's winrate is described as the amount of big blinds won per 100 hands played. e.g. 5bb/100 means that a player wins 5 big blinds per 100 hands in the long run.

A professional poker player strives to optimize his winnings. Many factors have to be taken into account when doing this. The following assumptions provide an inside in the process of how players maximize their winnings.

The first assumption is treated by Negreanu (2007). He states that generally speaking, in poker the level of competence of ones opponents rises as the stakes go up. At the online penny tables the skill level of the opponents is usually quite low, whereas at the high stakes tables most opponents have at least some basic understanding of the game. A good poker player could yield a very high winrate at low stakes tables but a much lower, maybe even marginal, winrate at high stakes tables. The question is at which stakes this player should be playing? This question can be answered by calculating the absolute earning per 100 hands of the player at both stakes. An example of how this is done is included in appendix 1.

A second assumption is that, in general, in poker winrates declines if a player plays more tables simultaneously. Online poker provides the opportunity to play multiple tables at the same time and playing multiple tables simultaneously means more hands to play, which

should equal more profit. Appendix 1 shows how this can be calculated. Why is not every professional poker player playing as many tables as technically possible? Well, the answer should not be that surprising; it is hard to focus on 24 tables and to distribute your attention to those tables that need attention at that moment. However, there are players that seem able to play this many tables, some of them claim that playing videogames before they started playing poker has brought them the ability to do so (Pokertableratings.com, 2001). Playing more tables will let a player play more hands per hour, but he will be forced to give up some of his winrate. The question is where the optimal point is for a particular player. For some it is four tables, for others it might be twelve.

A third assumption is that the winrate declines the longer a player plays. Once a player has established the optimal limit to play at and the optimal number of tables, there is a third factor that has to be taken into account; namely, the number of hours he should or can play a day. People can only hold on to their focus for a certain amount of time, after this point concentration will fade and decisions will be often sub-optimal. Some players are able to play many hours without losing much of their concentration, others need to play short sessions and have many (long) breaks.

To find the optimal mix that maximizes the winnings a couple of trade offs need to be made. At which limit are the winning per 100 hands the highest? How many tables is a player able to play in order to maximize the number of hands per hour? And finally, how many hours can a player play at a given day in order to maximize the number of hands played per day?

Poker knowledge and technology

Once a player has decided what kind of poker game he will play in order to generate an income, the next choices and options he is faced with are those that can contribute to the improvement of his poker game, which should increase the players winnings. A poker player is only able to sustainably win money in poker over a longer period of time, if he has an edge over his opponents. Creating and enhancing this edge is of crucial importance when it comes to playing poker in a professional way.

Technical aspects

To some degree, poker is a game of chance. Chance, however, is fair and equal to all players, whether a players is a good player or a weak player. Every player gets his share of winnings and loses due to chance and these should, in the long run, end up being equal for every player.

If not, poker players refer to these differences as variance. Winning a lot of money because of variance does not automatically make you a good poker player, and someone who loses large amounts of money because of variance cannot be described as a bad player.

When two or more players are in a hand, most of the time two scenarios are in place. First, there is the possibility that both players have a hand they consider good enough to win the pot and thus allows them to continue in the hand. In poker terms this would be described as two *made hands* looking each other up.

The second scenario is where one player has a made hand and the other has a hand that has not yet much strength, but has the potential to become a strong hand later as the hand develops. This is called *a race* between a made hand an a drawing hand. In both scenarios good decisions and mistakes can be made. It comes down to the decisions a player makes, backed up by calculations and assumptions, that decide whether he is a good player or a weak player.

Calculations are essential in order to make the optimal decisions in poker. It is of crucial importance that a player knows the different chances that are embedded in the game of poker. Over the past years many books have been written about the mathematics of poker, so there is no need to figure out the ins and outs of the poker game by yourself. If the game of poker was one of perfect information, or at least one person had perfect information, this person would be able to make the optimal decision at all times. But still, in order to do so this person would need to know how to make the calculations that reveal the best actions in certain situations. Perfect information without knowledge of how to use this information will not help you in the game of poker.

David Sklansky has been an authority on the mathematics of poker for years, his nickname is not by accident 'The Mathematician', and he has written several book on the subject. His two most famous books, Hold'em Poker for Advanced Players (1988) and Theory of Poker (1987) are up to now still considered as the origin of all theoretical poker books. Being able to calculate chances and combining them with the probabilities that one is faced with, is essential in making the theoretical optimal decision.

Assumptions have to be made when not all required information is available to make calculations. To players new to the game, these assumptions often feel like random guesses, but more experienced players have reasons to believe that their assumptions are based on solid grounds and are therefore accurate enough to work with. The most common assumption that has to be made is; what hand does my opponent hold? In order to make a decision on playing strategy a player needs to know his opponents hand, but with 169 different two-card

starting combinations in Texas hold'em it is useless to try to guess what hand your opponent has. Players that use database programs have a lot of statistics of their opponents, and using these statistics enables good players to deduct a *couple* of hands that are *most likely* for the opponent to hold. This is called formulating a range for ones opponent and is an essential part of profitable poker. With formulating a range, a player creates the illusion of perfect information. Good players realize that they are working with estimated numbers and accept that they can be wrong from time till time, but it is the best available solution for the problem of imperfect information in the game of poker. Perhaps the best book written on formulating ranges is the E-book Let there be range by South and Nguyen (2008).

<u>Supporting software and websites</u>

When playing live poker one can observe ones opponents and detect possible tells an opponent might give away that could help make the best decision. Players that play a lot of live poker value the ability to spot tells and consider it as a part of the game of poker. Two books that exclusively cover tells at the poker table are Mike Caro's Book of tells (2003) and Read'em and reap by Hellmuth and Navarro (2006). The latter state that 'Tells make all the difference'. This might be true, but in online poker however, tells are absent since one cannot not physically see ones opponent. However, this does not mean that there are not ways in which online players can extract information from their opponents. Several tools are available that provide information, make playing more convenient and help find the weak players online.

Database programs like Holdem manager and Poker tracker are software that construct a database of all the hands that are played at a certain table. These programs try to save as much useable information as possible. At the same time they project the collected statistics at the online poker table. Knowledge about the existence of Holdem manager and Poker tracker is widely spread among poker players and the advantage and edge that comes with using it, are such that it is to expect that the majority of the professional poker players will use it. What it is that makes these programs good tools for playing poker is that a player can easily see what tendencies and habits an opponent has. Seppälä (2009) clarifies the use of Holdem manager in a profound way and Bragonier (2010) has analyzed a persons poker game by exclusively looking at that players database statistics. Players that use a database program easily have an edge over players that play without, which are often the weaker recreational players. Some poker sites have tried to ban the use of the programs in order to protect the

weaker players, most poker sites, however, are compatible with programs like Holdem manager and Poker tracker.

Apart from the database software other programs have been developed to assist the poker player. Programs like Leakbuster, Pokerstove and Table Ninja all have very different objectives, but have nevertheless proven their value to serious poker players.

Leakbuster is a program, that analyzes a players database and detects so called leaks in the players game. Leaks are statistical flaws in ones game and can be quite obvious, but can also be quite difficult to detect. Leakbuster not only searches for leaks it also provides solutions to fix them. What is considered a leak by Leakbuster is based on statistical analysis of the statistics of winning players and losing players.

Pokerstove is a simulation program in which a player can calculate the probability a certain hand wins against an other hand. This can be calculated either preflop, on the flop or on the turn and provides the necessary insight in how chances are in a poker game. Pokerstove can also calculate the range of hands that belong to a certain percentage of hands. On Cardschat.com (2010) a comprehensive article about the use and restrictions of Pokerstove is posted, in which is stated that it is a very useful tool for analyzing hands and situations.

Table Ninja is a program that provides customizable hotkeys and tools that make playing online poker easier. When playing multiple tables at the same time, it can be difficult to react in time and adjust the appropriate amount to bet for example. Table Ninja claims to solve these problems with the use of hotkeys that speed up actions like folding, calling and raising.

Next to the database software and the other supporting software, there are tools that help players find the weaker players online. It is easier to win money from players that have fewer knowledge of the game then from good players, and that is why someone who is serious about making money in poker should be looking for tables with weak players to play against. This is called ´table selection´ and is an important aspect of playing professional poker.

Two kind of tools have been developed to make this quest for weak players a lot easier. First, there are ranking sites. These are sites that track the results from online poker players. These sites scan all the tables at the major poker sites and publish the results for each individual player, sometimes for free and at some sites a payment is required to see the results. These sites make it fairly easy to find out if a player at your poker table is a losing player or a winning player. The most well known ranking site is Pokertableratings.com.

Second, there are Scanner software programs that scan the players at the tables at a certain poker site and look for the results of these players in ones own database. If the

program finds a player sitting at the tables who shows weak results from the database, it will alarm you and direct you to that table. Once a weak player is found, whether by using a ranking site, a scanner or if he just appeared at the table, there is the possibility to add this player to a 'buddy list' if one were to use so called 'buddy finder software'. These software, like Smart Buddy, will alarm you if a player that is on the buddy list comes online. The program will then open the table that person is playing at and one is able to join.

Instruction sites and forums

Poker is a very dynamic game, tendencies, visions and insides change over time, again and again. A gameplan that has proven to be very profitable five years ago is at many points outdated nowadays. This creates a constant need to adapt and learn if a player wants to succeed as a professional poker player. There are several options to learn and keep up with poker, like books and E-books, video instructions sites, online poker forums and personal coaching.

First, there are many books and E-books written about poker to provide in the need of constant learning. Most of these book are written by well respected professional players who shed their light on the game of poker. The majority of the books cover analytical and mathematical problems players encounter at the poker table, but there are also books written about being a poker professional like Greenstein's Ace on the river (2005) and Schmidt's Treat your poker like a business (2009). A recent phenomena is the introduction of E-books, written by some of the best online poker players. These E-books give an extensive insight in the way these players think about poker and why they are so successful. The knowledge and ideas that these books contain are often highly innovative, which makes that other poker players are willing to pay a high price to acquire these books. An example of this is the E-book Let there be range by Cole South and Tri Nguyen (2008) that was introduced by the end of 2008 and was available for a price of $1850.

A second way to improve your poker game is by watching instruction videos, made by professional players on one of the several instruction sites. These videos are up for single sale, or one can get a subscription, which gives a member (un)limited access to more videos. Poker players are more then willing to pay to view the ways the professionals play.

Third, there is the possibility to learn about poker by debating on online poker forums. Most of the video instruction sites also have an online poker forum where people can discuss poker hands they have played. There are also many independent forums that do not have a video service. The great advantage of a forum linked to a video site is that at these forums the

video instructors, can give comments and advice on hands posted by members and help understand certain aspects of the poker game. The largest independent poker forum is the 2+2 forum with over 250.000 members.

Lastly, there is the possibility of personal coaching in order to try to improve the player's poker game. Most of the video instruction sites offer the possibility of one-on-one poker coaching by one of the site's instructors. Personal coaching is an expansive way to learn about poker because of the quite substantial hourly rates. For example the rates for personal coaching at Nederpoker.nl range from E 115.- to E 700.- per hour depending on the instructor and the stakes that are played at. The reason behind these rates is twofold; first, an hour not played by a poker professional is considered money not won, therefore the instructor needs sufficient compensation. Second, if an instructor can improve a players winrate by e.g., 1bb/100, this will result in higher winnings in the future. Instructors claim that because of the future extra winnings the high rates for coaching are justified.

Poker websites

There are over a hundred online poker rooms where people can play poker. The poker site market is a highly competitive one, where there is fierce competition to win the favor of the players. Poker sites make their money from the players that play on their site by withdrawing rake of every pot that is played. Without players active in a poker room, a poker site has basically no income. The costs of a poker site consist mostly of advertising and benefits to attract players to play at the site. Poker sites make money as long as people (keep) playing on the site and do not switch sites or quit poker. And exactly this explains the enormous amount of money spent on advertisement and loyalty programs by poker sites (McMullan and Kervin, 2010). This is where the relevance to professional poker players can be found. In order to attract and maintain players to the site, poker rooms have developed several benefit programs that reward players for playing at the site. The most commonly used reward systems are rakeback contracts, loyalty programs and bonuses.

In order to reward players that play frequently on the site a poker room can return a percentage of the rake to these players. This is called rakeback and is usually issued through an affiliate who mediates between the poker site and the player. Rakeback percentages start around 25% and, in general, can go up to 60%. One of the largest affiliates is the company RaketheRake with their affiliate site raketherake.com who have rakeback deals with many poker sites that allows rakeback deals.

A second construction to reward players are the so called loyalty programs. These programs usually consist of several steps or levels that can be reached by earning a certain amount of points every month. These points are earned by playing hands in the poker room, the more you play, the more points you earn. The higher the status level that is reached after a month, the more benefits will be available to the player.

A third way to reward players is by handing out bonuses. The most common bonus is a deposit bonus. If a player deposits money on a poker site, he or she gets a bonus of up to 100% of the deposited amount. These bonuses however are not immediately withdrawable, they have to be released first be playing a certain amount of hands or earning a certain amount of points. Some sites will also issue bonuses to players that have played on the site, but are no longer active. By handing out these bonuses the site hopes to retrieve these players.

Lastly, there are also poker sites, like Bodogpoker.com and NoProPoker.com, that try to prevent professional players from playing at their site. These sites do not, or have little benefits to reward players. They do this in order to prevent too many professional players playing at the site and thereby protecting their recreational players. As a result the skill level of ones opponents on these kind of sites should be considerably lower then on sites with benefit programs. A professional player is faced with a choice between sites with good reward programs and sites without these programs, but with a considerably more profitable players pool.

Holding on to your money

The amount of money a poker player has available to play with is called his or her 'bankroll'. The larger ones bankroll, the higher the limits that can be played without jeopardizing the entire bankroll. To recreational players it is not of elementary importance to keep their bankroll intact, they play for fun and if they bust their bankroll they wait until they have money left to spend on poker. Professional players however cannot afford to lose their bankroll since they rely on poker to make living. Without their bankroll they are basically out of work. In order to prevent this professional player use what is called bankroll management in order to keep their job at all times.

Bankroll management dictates the limits a player is allowed to play at and the points where a player can move up are has to move down in stakes. This is off course not an exact science and is open for discussion, but it provides an idea of how professional poker players should think about their money. Veldhuis (2007) has developed a schedule for bankroll management that explains which stakes are suitable to play with a certain amount of bankroll

available. It also shows at which point a player should move down or up in stakes if certain milestones in bankroll size are reached.

Table 1: Bankroll management diagram

Buyin:	Play from xx$ Bankroll:	Go back to former limit when:
Pennies	Begin	Borrow?
10$	150$	75$
25$	550$	350$
50$	1,250$	850$
100$	3,000$	2,000$
200$	9,000$	6,000$
400$	16,000$	12,000$
600$	35,000$	24,000$
1,000$	100,000$	60,000$
2,000$	220,000$	160,000$
5,000$	600,000$	300,0000$

Source: Veldhuis, 2007
(N.B. The diagram applies to No Limit Hold'em and a mix of heads up, short handed en 6/9max games.)

Table 1 clearly shows the roll of variance in poker as one is allowed to play 10NL with only 15 buy ins behind (15x$10=$150), but in order to play at 5000NL a player needs 120 buy ins behind (120x$5000=$600.000). The higher the limits, the tougher the opponents one is faced with and thus the higher the variance in bankroll. The schedule also shows at which point a player should move down or up in stakes if certain milestones in bankroll size are reached. Negreanu (2007) adds to this that living the life of a serious poker player can be stressful enough all by itself. The last thing you want to do is compound that by continually adding financial pressure to the mix.

A poker player does not always play the best he/she can e.g., playing while tired, lack of concentration and other factors can put someone off his or her so called 'A-game'. When playing and losing, and this is not due to variance, a player should take a break and resume playing at a later point. The problem for many players however is that it is difficult to detect if one is playing bad. This requires an objective view on yourself and the ability to recognize ones own flaws.

A solution to this problem can be found in installing and sustaining a so called 'stop-loss' for every session of play. This means that a player agrees with himself to stop playing if a certain amount is lost during the session. This amount is in general not described as an amount of money, but rather as a number of buy ins, since these can be applied to all the different limits, whereas a stop-loss of for example $200 does not make sense to someone who plays $5000NL, but it does to someone playing $50NL. A stop-loss of three buy ins is for both players the same. By installing a stop-loss a player prevents himself from playing long sessions when he is playing bad and thus losing money.

Personal characteristics

Having defined ones poker game and constantly working to improve it might look like all there is to playing professional poker through the eyes of an outsider. Several professional players however, argue that in spite of all the good intentions of many players to improve their game, some are just not cut to be, and live the life of, a professional poker player. What other factors are there that determine whether someone has what it takes to become a truly successful professional poker player?

Poker, relations, family

What is the impact of poker on your relation and family? Being a professional poker player is in many ways different from having a regular nine till five office job. The most important difference would be the uncertainty in income every month compared to the fixed salary paid to regular employees. A second aspect to consider is the fact that online poker professionals are working at home most of the time. Both the flexible salary as well as the time spend at home are not aspect that apply to (online) poker exclusively, but they are to considered when having a relation or a family. Greenstein (2005) states that players who play most of their poker online have the advantage of spending a lot of time at home. Unfortunately, playing poker all day while ignoring one's spouse and children is worse than not being home. Your lack of attention will wear on them, and your frustration over losses will be more evident when you don't have the cooling off period afforded during the drive home when you play live poker at casino's and card clubs. He continues that expert poker players excel at a game that rewards deception and the ability to bluff. It would not be surprising to find that the children of professional poker players tell more lies than other children. Naturally, it is his job as a parent to teach his children not to lie.

Life poker in casinos and card clubs usually starts in the evening. Most casinos do not open there poker room before the late afternoons and the action only starts later on. Casinos in Las Vegas are for example open twenty-four-seven, but it is rare to see many games active at nine o'clock in the morning. This implies that playing professional poker in life games forces a player to play from late in the evening into the night. This can easily effects ones relation with partner and children because the family can get the feeling that they live their lives alongside each other. The player's partner and children go to work and school in the morning when the poker player just got home from a poker game. Playing poker online can resolve this time synchronizing problem, because online poker is available 24 hours a day, all around the

world. A player could choose to play in the morning and the afternoon and be off from work when his partner and children come home as well. In theory this could work out, reality however, creates bumps in the road. Even though online poker is available at any given time, the truth is that at early Western European morning the American continents are a sleep and the European players in general do not start playing until noon or even later. Also consider that the Asian poker market has yet to emerge, which leads to very few action at the online poker tables until noon in Western Europe. Related to this is the fact that professional players make most of their money by playing against recreational players, but these recreational players usually play after they get home from work. This means for European professional players that the most profitable times to play are from 18h when the European players come home until around 2 am when all American players are home from work.

Being a poker professional influences ones environment and the questions is whether these influences are desirable. It certainly does not seem optimal to be in a relation or have a family while being a professional poker player compared to more common jobs and careers.

Personal characteristics, mindset and poker

Greenstein (2005) argues that no matter if a player reads all the poker books available and becomes a technical expert on which hands to play and how to play them, he is still likely to end up broke. This is due to the fact that most people do not have the appropriate character qualities required to be a good poker player. He provides 12 personal profile questions that should determine whether a player is suitable to become a professional poker player. These questions provide some interesting insights about the character aspects that a player should try to develop or control in order to become a truly good poker player. Furthermore he lists 25 character qualities that he feels separates winning players from losing players. Combined these questions and character qualities sketch an extensive idea of which personal characteristics distinguish professional poker players from recreational players.

It is important that a player does not get distracted by incidents that cross his path in life. Such incidents should be handled as if they were obstacles in a video game. Just maneuver and avoid them. Things will happen, also at the poker table, but being able to ignore them will make you a better player.

Losing your temper and showing your frustration is also something that should be avoided. An effective competitor does not waist his energy on emotions, but rather spends time thinking about adjustments that could prevent frustrations and mistakes. 'Psychologically toughness' is a characteristic that connects with this. Good players are able to rationalize and

accept if and why certain things happen in poker. Players that are not that psychologically tough can easily get upset and start to play accordingly. 'Persistence' must also be placed here, as variance in poker can be high and so are the swings, but a good player will continue to make the decisions that he believes are right.

Ones ego can be in the way of winning money at the poker tables according to Greenstein. He asks; do you try to win every argument? It is good to be competitive, it is what is necessary to become a good poker player, but poker is about winning money and you should let the losers win the arguments. People with weak egos try to win every argument they get into. A confident player however, does not need to prove he is right, especially not to his opponents. Do not let your ego get in the way of your main focus; making money. 'Insensitiveness' can also be placed here, as good players can be cold and calculating and primarily care about winning money from others.

Knowing the value of money is negatively correlated with being a good poker player. (Greenstein, 2005). If you feel uncomfortable making a $200 bluff on the river, you will more likely choose not to make that certain bet, although it might be the optimal move at that moment. Money at the poker table is just a tool to play the game with, it is not real money. As soon as a player finds himself playing with money it will affect his game in a negative way. This is one of the main reasons why bankroll management is of such elementary importance, a player must at any given point feel comfortable with the chance of losing the amount of money that is at stake. For some this point is reached at a couple of dollars, others are still comfortable playing for millions of dollars. Related to this is what Greenstein calls 'fearless'. A good player is not afraid to make, what he believes is, the right move at a certain point, even if it is risky.

Good poker players are attentive to detail, as little details can make all the difference in making the best decision in poker. Good players view a certain hand very different then a weak player. Harrington (2004) describes how both type of players will have a different view on a same hand that is played. He concludes that a good player takes as many details as possible into account when analyzing a hand, whereas a weak player will only pay attention to his own hand and what the result of the hand was.

A good player is intelligent enough to adapt his strategies when they are not working and is also able to deduce what his opponents are doing, what they are likely to do, and how to use this information to his maximum advantage. Poker is a highly dynamic game that requires constant adaptations and only players that have a certain level of intelligence turn out to succeed in this.

Greenstein concludes with some characteristics that good poker players might not have, but two of them, athletic/healthy and educated are at least arguable. Life as a poker professional means many hours of sitting in a chair and very little physical exercise. Although this is true in principle, only a few poker players play 16 hours of poker a day and sleep the other 8 hours that are left. There should be plenty of time left in which a poker player can get the necessary physical exercise to stay healthy and get in shape. Also the fact that if you are physically in shape, this indirectly positively effects your mental shape, which, for a professional poker player, is essential, can be an incentive for professional players to engage in sports more than average (Alleyne, 2009). Furthermore can the earlier mentioned competiveness of professional poker players be a stimulant to engage in sport activities. Lastly, engaging in sport activities can be an easy and healthy way to get social interactions and since the life of an online poker player does not involve many physical interaction during working hours, sports can be a nice solution.

Greenstein argues that although poker players need to be intelligent, most of them are not highly educated. He explains this by assuming that intelligent people with the choice to get education will mostly choose to do so and the ones that do not have this choice more often will choose the life of a poker player. Even though this seems plausible, there seems to be a large group of professional poker players that is a student at universities combined with being a poker player. It will be just a matter of time before these students graduate and can be considered as high educated (professional) poker players with certain characteristic qualities.

Section II

Data

Three main research questions capture all of the aspects that are important when it comes to playing professional poker.

RQ1: Choosing your game; (i) what variant of poker do professional players prefer, (ii) how many tables do they play simultaneously, and (iii) how many hours a week do they spend on playing poker.

By investigating research question one (from now on RQ1), readers can get an idea of the choices poker players have to deal with when deciding to play poker and if some of these choices differentiate professional players from recreational players.

RQ2: Knowledge and technology of poker; (i) do professional poker players have enough basic statistical knowledge of the game of poker in order to be successful, (ii) do they use supporting software and instruction video websites, (iii) do they practice table selection and bankroll management, and (iv) how do they value rakeback and bonuses.

Many tools are available to poker players that support them in the process of constant learning and adaptation. It is expected that professional players will more often use one or more of the available tools, since their need for good results is much higher as opposed to that of recreational players. Research question two (from now on RQ2), will clarify if this is truly the case and where the most important differences can be found.

RQ3: Personal characteristics; (i) how do professional poker players combine their personal relationships with poker, (ii) do they lack education, (iii) what is their attitude towards sports, and (iv) how do they feel about being a professional poker player.

Professional poker players face many social and environmental pitfalls. It is important to know about these pitfalls and learn how to avoid and deal with them. Research question three (from now on RQ3), tries to enhance the understanding of this aspect of poker life that, so far, has had very little attention in poker literature.

Research methodology

In order to analyze the three research questions that concern the characteristics of professional poker players, a field study was conducted. A questionnaire was chosen as research design. The questionnaire (a copy is enclosed in appendix 2) consists of 24 multiple choice questions, covering all three research questions.

Before distribution, a personal friend, who is also a professional online poker player reviewed the questionnaire on relevance and understanding. Shortly after, the questionnaire was uploaded on the internet with the use of the website Thesistools.nl. By the end of December 2010, a hyperlink to the questionnaire was posted on the four largest Dutch online poker forums; Pokernews.nl, Pokerinfo.nl, Nederpoker.nl and Pokercollege.nl. The hyperlink was placed in a forum post which also contained a message that this questionnaire was especially intended to write a thesis about the characteristics of professional poker players, but that all kinds poker players were more than welcome to fill out the questionnaire. These posts on the different forums resulted in 445 respondents in the next two weeks. The first week resulted in approximately 400 respondents and in the next week very few new respondents could be added, and therefore the questionnaire was taken offline. Some respondents left comments in the forum topics about certain questions that they felt they were unable to fill out in a way that they whished to. This mostly concerned tournament players and heads up players, who felt that the questionnaire was most suitable to six-max and full ring cash game players, but not to them. In a reaction, other players argued that these players should not take the questions too literally, but should try look at the intention of the question and answer it accordingly. Lastly, a statement that secured the privacy of the respondents was announced in the forum posts and at the end of the questionnaire. In order to get a reliable response, a privacy statement was necessary since online poker is still considered illegal in the Netherlands and because it is assumed that many players refuse to pay taxes over their winnings. The sample profile is summarized in table 2.

It is said that poker is a man's world. The population in this survey confirms this statement, because 98,2% of the respondents is male and only 1,8% female. The other data also seem in line with expectations. As the data is collected through online poker forums it is expected that more younger people will respond in compare to older people, because younger people are more likely to participate in online communities.

Table 2: Descriptive statistics

	N	%
- Gender		
Male	384	98,2
Female	7	1,8
- Age		
< 17	5	1,3
18 - 25	220	56,3
26 - 35	132	33,8
> 36	34	8,7
-Type of game		
Online	346	88,5
Live	19	4,9
Both	26	6,6
- Type of player		
Recreational	265	67,8
Professional	126	32,2

Total N= 391

Furthermore, the distribution of online and live players can be explained by the fact that the data was collected online, and by the fact that live poker is heavily regulated in the Netherlands. There are some notes and thoughts about the process of collecting the necessary data. Since all the response has been collected through poker forums, it is not sustainable to assume that this dataset is a perfect reliable reflection of the entire Dutch online poker community. Poker players that visit poker forums will have at least some willingness to learn about the game of poker. The big losing recreational players might not care about this and are less likely to attend a poker forum. Since this survey focuses on professional online players, this lack of recreational players is not of much importance as long as it is recognized that the recreational group of players in the dataset is probably more then average educated in the game of poker compared to the entire recreational population. Related to this is that the ratio professional player: recreational player in the dataset will weight heavily to professional players compared to the entire poker population in the Netherlands, as most professional players will visit forums. A final note is that there are two questions in the questionnaire that require a correct answer in stead of a personal answer (questions 18 and 22). The respondents were asked not to 'cheat' at these questions by looking up the right answer, but if they did or did not is impossible to find out. As a result the answers to both questions might include too many correct answers.

Measurement

Of the 24 multiple choice questions the questionnaire consists of, five of them were used to divide the population into recreational poker players and professional poker players. The 19 questions that are left, are used to either describe the population as shown in table 2, or to help answer the three research questions.

RQ1 can be divided into three parts. The first part is about the different variations of the poker game (Question 9) and whether professional players have a preference to one of these types of poker. As possible answers to this question, respondents could choose between No limit Texas hold'em, limit Texas hold'em, pot limit Omaha and a fourth options for all the other variants of poker. The second part of RQ1 consists of question 11, which asks about the time spent on playing poker each week. The third part of RQ1 investigates the amount of tables that players play simultaneously with the use of question 13 from the questionnaire.

RQ2 consists of four parts and covers eight of the questions from the questionnaire. (Questions 15 till 20, 22 and 23) The first part treats the mathematical and statistical knowledge of poker players with the help of questions about the chance of flopping a set when holding a pocket pair and a question about defining a preflop range. Four possible answers are presented, with one answer being the right answer. These two questions indicate the statistical and mathematical knowledge of the poker game. Part two covers the use of supporting software and the willingness to keep improving in the game, e.g., respondents had to answer questions about the frequency they watch poker instruction videos. The third part studies the use of bankroll management and table selection by poker players. Respondents were asked to give an indication about how may times they busted their online bankroll, whether they play with a 'stop-loss' and when they move to a specific other table. The last part of this research question investigates the attitude of poker players towards rakeback, bonuses and poker sites without benefits. Players are asked to give their opinion about whether they play on poker sites that provide none or little reward systems.

RQ3 uses five questions from the survey (Questions 3, 4, 5, 21 and 24) to study four different aspects of the life as a professional poker player, i.e., do they practice sport, do they have a relationship, what is their level of education an what do they find truly important when it comes to playing successful poker.

All the data out of the multiple choice questions are tested with the Chi-square test, and, whenever possible, also tested with the Independent-Samples T-test. The Chi-square test is a statistical test, used to determine whether there is a significant difference between expected data and the data observed. A null hypothesis is formulated stating that there is no

significant difference between expected and observed results. Depending on the outcome of the test, a level of significance can be used of either 10%, 5% or 1%, where the smaller percentage is preferred if possible. When the outcome of the test is smaller than the significance level, it can be concluded that the differences in the data are not a result of chance and the null hypothesis can be rejected.

To investigate whether two averages of an interval variable are equal, the Student's T-test can be used. When dealing with two independent samples the Independent-Samples T-test must be used. A null hypothesis is formulated that states that both means are equal. The test is based upon the assumption that both samples are normally distributed. This is the case if the variable in the population is normally distributed, or if both samples exist of at least 30 cases. Because the Independent-Samples T-test compares means, it can only be used when the depend variable consists of increasing or decreasing answers, at an interval scale. Thus, in this survey, only questions 11, 13, 15 and 16 are applicable for the Independent-Samples T-test, the rest of the questions are tested only with Chi-Square test. The Chi-square test results of the four questions tested with the Independent-Samples T-test are submitted in appendix 3. A critical note considering some of the reported answers is that there might be noise in the results as people had to answer the questions within their own perspective. A question asking how many hours a week they spend on playing poker, might get different answers from someone who just got back from a holiday compared to someone who stayed home and played some poker. Respondents answer with an average number and the Independent-Samples T-test calculates an average using the reported averages.

Simultaneously with the Independent-Samples T-test, Levene's test for equality of variances is conducted to investigate whether the variances of both populations are equal. The null hypothesis states that both variances are equal. If the null hypothesis cannot be rejected equal variances are assumed (De Vocht, 2000).

Section III

Results

Defining professional poker players

The survey resulted in 445 respondents from which 418 were complete and 27 incomplete and therefore unusable. In order to divide the 418 respondents into the categories 'recreational player' and 'professional player', question 14 from the questionnaire was used. Asked for their monthly winnings out of poker, the respondents that answered with option one, two or three (respectively monthly winnings smaller then zero, winnings between zero and $100 and winnings between $250 and $1000), are considered recreational players and the ones that answered with option four or five (respectively monthly winnings between $1000 and $3000 and winnings over $3000 a month), are considered professional players since they claim to win enough money every month to secure a living out of poker only. These monthly winnings are self-reported answers, but in order to secure the players privacy it is the best option to work with.

   This first shifting resulted in 237 recreational players, 107 professional players and 74 respondents that kept their winnings private. To divide these last 74 respondents into the two categories, Q8 (which kind of poker do you play? Cash game, tournaments, sit and go tournaments and the option 'no clear choice') was used first. The questionnaire only provides information to allocate the cash game players out of these 74 rest cases into the two main categories (professional player or recreational player) and that is why only the players that answered option one or four at question 8 were further allocated. This resulted in 47 respondents that play, at least some, cash games and 27 tournament players that were unable to allocate. The remaining 47 players could be divided into recreational players and professional players with the help of Q10 and Q12 of the questionnaire (respectively: what limits do you mostly play and how many hands do you play each month on average). Of the 47 respondents left that had answered option three *or* four at *both* Q10 and Q12 ($100NL level minimum and more then 10.000 hands per month) are considered professional players, the remaining respondents are placed under recreational players. This resulted in 19 more professional players and 28 more recreational players (N.B. Q10 asked about the stakes a player usually plays, players that play at $0.5/1 stakes minimum qualify for professional players as long as they also play a minimum of 10.000 hands a month, as asked in Q12). After this last distribution, the final results are in shown in table 3.

Table 3: division recreational players and professional poker players (in #)

	Divided by Q14	Divided by Q8, Q10 and Q12	Total
Recreational players	237	28	**265**
Professional players	107	19	**126**

Question six from the survey shows that this distribution of recreational players and professional players is in line with the perspectives the population has about itself. Table 4 shows that there are large significant differences between the answers 'work' and 'poker' between recreational players and professional players. It is expected that many professional poker players are also students who feel that study should be their primarily daily occupation and because of that, have answered the question with option 'study'. Taken this into account, table 4 can function as a reliable check to see whether the distribution of recreational players and professional players is done in a logical and accurate way.

Table 4: Primarily daily occupation by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
*Q6. What is your primarily daily occupation?**			
- Study	35,5	34,9	35,3
- Work	**49,1**	18,3	39,1
- Poker	6,0	**40,5**	17,1
- Something else	9,4	6,3	8,4

Total N = 391
* significant at a 99% confidence level (P=0,000)

Out of the 445 respondents, 391 respondents were divided into 126 professional players and 265 recreational players. A note at the 19 professional players that are selected by Q8, Q10 and Q12 is that these are players that play cash game poker at high limits and many hands per month. This is a strong indication that these players can be considered as professional players, however they could be players that loose a lot of money by playing high limits, many times, each month.

Defining a player's poker game

Variations of the game of poker

The results of Q9 from the questionnaire are displayed below in table 5 and do not show a significant difference in variation of poker played by the two groups of players. Clear is that the no limit Texas hold'em variant of poker is the one most frequently played. This is

consistent with Brunson (2002) who states that no limit Texas hold'em is 'the Cadillac of poker'. The fact that no significant difference was found can be explained with the idea that professional players will always try to find and follow the recreational players and that recreational players want to play the kind of games they see the big stars of poker play on television. A small difference can be noticed by Pot limit Omaha, which is played slightly more often by professional players, 14,5% by recreational players compared to 9,8% by recreational players. The most credible explanation for this can be found in the much higher volatility of pot limit Omaha compared to No limit Texas hold'em (Berman, 2005). Swings are much higher in PLO and recreational players might not have the bankroll (management) to play this type of game over a longer period.

Table 5: Poker variant played by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q9. What variant of poker do you mostly play?*			
- No limit Texas Holdem/ Pot limit Texas Holdem	**86,8**	**84,1**	**85,9**
- Limit Texas Holdem	2,3	0,0	1,5
- Pot limit Omaha	9,8	14,3	11,3
- Some other variation	1,1	1,6	1,3

Total N = 391
* not significant

Time spend on playing poker

Do professional poker players spend more time on poker during the week than recreational players is the case that is investigated with Q11 from the questionnaire. The result is a highly significant difference in time spent on poker every week between the two groups. With 32,1% of the recreational players only playing up to five hours a week, 7,9% of the professional players doing so, and 8,3% of the recreational players playing over 20 hours a week compared to 36,5% of the professional players doing so, the two groups almost look as perfect opposites of each other. These results are consistent with the fact that recreational players are more likely to have a (full time) job and thus fewer time left to play poker compared to professional player to whom playing poker is their actual job. Apart from the fact that there is a significant difference in time spend on playing poker, it is also interesting to see how big the difference between both groups is. Results show a mean difference of 0,96 between those of the recreational group with mean 2,09 and the professional group with mean 3,05. Table 6 shows that this difference is significant.

Table 6: Hours of poker played by recreational- and professional poker players

Q11*	Mean difference	Recreational	Professional	P
How many hours per week do you play on average?	-0,96	2,09	3,05	0,000

According to Levene's test (P=0,306), equal variances are assumed
* A higher score indicates more hours of playing poker on a scale from 1 to 4
- answer 1 indicates playing till 5 hours a week
- answer 2 indicates playing between 5 and 10 hours a week
- answer 3 indicates playing between 10 and 20 hours a week
- answer 4 indicates playing more than 20 hours a week

The number of tables played simultaneously

Results of question 13 show a significant difference in the number of tables played by recreational and professional players. 20,4% of the recreational players play one or two tables at the same time, whereas only 5,6% of the professional players do so. The largest difference however, can be found at playing seven tables or more; 18,9% of recreational players play seven tables or more and 52,4% of the professional players claims to play over seven tables simultaneously. Reasons that explain this difference are the fact that you need sufficient monitor screen capacity to play multiple tables. A regular 19 inch screen can support four tables, if you want to play more tables a second screen or larger screen is a necessity. Recreational players will often have only one screen available, whereas professional poker players have two screens or one large 30 inch screen. A second reason is that variance decreases as numbers increase, professional players try to play as many hands as possible in order to reduce variance. Recreational players might not care about this. These results also show the ability of professional player to spread their attention and quickly process information in a profitable way.

Table 7 shows a significant difference of 0,87 between the means of recreational players and professional. Professional players tend to play more tables than recreational players as a mean of 3,28 indicates that professional players play over six tables on average, whereas recreational players play over four tables simultaneously.

Table 7: Amount of tables played by recreational- and professional poker players

Q13*	Mean difference	Recreational	Professional	P
On how many tables do you play simultaneously?	-0,87	2,41	3,28	0,000

According to Levene's test (P=0,025), equal variances are not assumed
* A higher score indicates playing on more tables simultaneously on a scale from 1 to 4
- answer 1 indicates playing on 1 or 2 tables
- answer 2 indicates playing on 3 or 4 tables
- answer 3 indicates playing on 5 or 6 tables
- answer 4 indicates playing on 7 or more tables

Poker knowledge and technology

Statistical knowledge of the poker game

Being able to work with statistics and numbers provided during a game of poker is a key concept of playing winning poker. It enables a player to make the most accurate decisions. If a player, with help of a database program, notices that his opponent opens 10% of his hands in first position, it is important to know what range of hands matches that percentage in order to know what kind of hands he/she is up against. Asking both recreational and professional players to define a top 10% preflop range, resulted in the answers showed in table 8.

Table 8: Poker mathematic knowledge by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q18. What does a top 10% preflop range look like (Calculated by Pokerstove)*			
- {88+,AJs+,KQs,AKo}	37,5	20,2	31,9
- {88+,ATs+,KTs+,QJs,AJo+}	27,0	27,4	27,2
- {77+, A9s+, KTs+, QTs+, AJo+, KQo}	**18,9**	**35,5**	24,3
- {77+, A7s+, K9s+, JTs+, ATo+, KTo+, QJo}	1,5	1,6	1,6
- No idea	15,1	15,3	15,1

Total N = 373
* significant at a 99% confidence level (P=0,002)

The correct answer to the question is option C, {77+, A9s+, KTs+, QTs+, AJo+, KQo} (an explanation of how to read this range is presented in appendix 4). Only 18,9% of the recreational players could identify the correct range matching a top 10% preflop range, whereas 35,5% of the professional player could. The other answers represent ranges of 5%, 8% and 15% and recreational players tend to estimate a 10% preflop range smaller then professional players e.g., 37,5% of the recreational players answered A (5% range) and only 20,2% of the professional players picked that answer. The answers B (8% range), D 15% range) and E (No idea) are almost equal between recreational and professional players.

The results to Q22, as shown in table 9, show a similar profile. The right answer to the question 22 is, again, option C (roughly 12,33%). 60,3% of the professional players gave the right answer, whereas only 38,5% of the recreational players knew the right answer. Again the differences showed to be significant. Notable is that 25,6% of the professional players gave option B (8,33%) as an answer and 35,3% of the recreational players did so. The most obvious reason for these large percentages is the fact that the right answer (roughly 12,33%) more or less equals '1 out of 8 times', which is a common term used in poker when it comes to defining the chance of flopping a set. Players probably have connected 'flopping a set' and

'8' with each other and have therefore picked option B (8,33%) this often. The fact that both groups showed a higher percentage of correct answers at Q22 compared to Q18 can be explained by the fact Q22 covers a more basic concept of the game of poker whereas the concept in Q18 is a much more sophisticated one and requires more ability and dedication to master.

The fact that professional players are more able to give the correct answer indicates that they have either studied the mathematics of poker, or that they have such analytical capacity to provide the right answer.

Table 9: Poker mathematic knowledge by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q22. What is the chance of flopping a set when holding a pocket pair?*			
- Roughly 7,33%	4,4	5,0	4,6
- Roughly 8,33%	35,3	25,6	32,2
- Roughly 12,33%	**38,5**	**60,3**	45,6
- Roughly 13,33%	6,7	5,0	6,2
- No idea	15,1	4,1	11,5

Total N = 373
* significant at a 99% confidence level (P=0,001)

Willingness to improve

Results show a significant difference in time spent on watching and studying instruction videos between recreational players and professional players. More than half of the recreational players (54,2%) do not, or only incidentally, watch instruction videos. Perhaps a little surprising is the fact that nearly one third (32,8%) of the professional players hardly ever watch these videos. More in line with the expectations is the fact that 32% of the professional players watch at least three instruction videos a month, which is clearly in contrast with only 11,4% of the recreational players that claim to watch three or more videos each month. Apart from the differences in incentives to improve their game between professional players and recreational players, an other factor can explain the differences between both groups. A player has to pay to watch these instruction videos and with subscriptions that can cost over $30 a month, the reward for recreational low stakes players might not measure up, or not enough, to the costs of these videos. Table 10 shows a significant difference in the mean of watching instruction video of both groups where professional players watch more instruction videos each month then recreational players.

Table 10: Watching instruction video's by recreational- and professional poker players

Q15*	Mean difference	Recreational	Professional	P
How often do you watch a poker instruction video on one of the many sites available?	-0,64	1,86	2,50	0,000

According to Levene's test (P=0,000), equal variances are not assumed
* A higher score indicates watching more instruction videos on a scale from 1 to 4
- answer 1 indicates sporadically/never watch instruction videos
- answer 2 indicates less then once a month watch instruction videos
- answer 3 indicates once or twice a month watch instruction videos
- answer 4 indicates three times a month or more often watch instruction videos

The use of supporting software in poker is a helpful way to improve your results. It is therefore expected that professional players are more likely to use them. The results in table 11 show a significant difference in use of supporting software between recreational and professional players. Interesting to see is the fact that 69,7% (52,3%+17,4%) of the recreational players claims to use a database program like Holdem manager or Poker tracker. This unexpected high percentage can be explained by the earlier mentioned fact that the population of recreational players is created out of visitors of poker forums and that these players therefore are more likely to hear about the existence of these kind of programs. Furthermore, 12,8% of the professional populations claims to play without any supporting software, which seems an unexpected high percentage. Lastly, considering the fact that Holdem manger costs $89,99 one would expect fewer recreational players to use the program.

Table 11: Usage of supporting software by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q17. Do you use supporting software during poker?*			
- No	30,3	12,8	24,7
- Yes, but only a database program with hud (HM, PT, etc)	52,3	60,0	54,8
- Yes	17,4	27,2	20,6

Total N = 389
* significant at a 99% confidence level (P=0,000)

The reported answers to question 15 and 17 clearly show the higher willingness (and necessity) to develop and improve of professional players compared to recreational players.

Bankroll management and table selection

Bankroll management and table selection are both of elementary importance to professional players. Bankroll management prevents players from busting their bankroll, the idea is that it is impossible to lose your entire bankroll at once. This is crucial for professional players, as their bankroll is their tool for making money. Table selection secures that a player is always

playing in a game where he/she is expected to make money and is not up against opponents he/she can not beat.

Table 12: Busting the online bankroll by recreational- and professional poker players

Q16*	Mean difference	Recreational	Professional	P
How many times have you busted your online bankroll?	0,43	2,11	1,67	0,000

According to Levene's test (P=0,000), equal variances are not assumed
* A higher score indicates busting more times your online bankroll on a scale from 1 to 4
- answer 1 indicates never busted your online bankroll
- answer 2 indicates once or twice busted your online bankroll
- answer 3 indicates 3 till 6 times busted your online bankroll
- answer 4 indicates more than 6 times busted your online bankroll

Results of Q16, shown in table 12, show a significant difference between the number of times recreational and professional players have lost all their poker money online. 20,8% of the recreational players, and only 5,6% of the professional players, claim that they busted their online bankroll over six times. This is consistent with the idea of recreational players depositing small amounts when they feel like playing and mostly either lose it all or make a nice profit and cash out until the next time they want to play. 55,2% of the professional players claims to have never lost their bankroll, whereas 41,7% of the recreational players claims so. Recreational players are less likely to use bankroll management compared to professional players and the results are in line with this expectation. The independent samples T-test shows a significant difference in the number of times recreational and professional players have busted their online bankroll. These results furthermore show the ability of professional players to handle assets without risking to lose them all at once.

A stop-loss is a tool to manage a player's bankroll and to prevent long losing sessions caused by tilted play. Since it is more important for professional players to maintain a healthy bankroll and tilted play directly influences their income as opposed to recreational players, it is expected that professional players are more likely to play with a stop-loss.

The results in table 13 show a significant difference in the use of a stop-loss between recreational and professional players, but the outcome is somewhat surprising. Recreational players appear to be the ones that more often play with a stop-loss instead of professional players. 19,0% (6,7%+12,3%) of the recreational players plays with a stop-loss and 23,8% occasionally uses one. For the professional population these percentages are 10,7% and 18,2% respectively. An explanation for this somewhat remarkable outcome can be found in the percentage of players that have answered that they let other criteria decide whether to continue playing or quit. Rather large percentages of the respondents state that they do not use a stop-loss, but rather let other factors influence their decision to keep playing or quit (50,0%

of the recreational population and 70,2% of the professional population). Playing with a stop-loss is sometimes considered as a inferior, second best option, as it is better to prevent tilt then to treat it. It could be possible that many of the professional players have 'outgrown' the idea of a stop-loss and have, after some years of experience, learned to control their emotions.

Table 13: Playing with 'stop-loss' by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q23. Do you play with a 'stop-loss' of X-buy-in?			
- Yes, and I always strictly enforce this	**6,7**	**4,1**	5,9
- Yes, but sometimes I don't enforce it because of several reasons	**12,3**	**6,6**	10,5
- No, other criteria make me decide to quit or continue playing	50,0	70,2	56,6
- No, not as a rule, but it can happen that I put one on myself	**23,8**	**18,2**	22,0
- No idea	7,1	0,8	5,1

Total N = 373
* significant at a 99% confidence level (P=0,002)

Table 14 shows the results of how both populations have answered Q19 concerning table selection. It is expected that professional players will put more effort in finding profitable tables to play at since they rely on the winnings from playing poker. Recreational players on the other hand, often find themselves with an hour to spare and just want to play a game of poker at that particular moment, they care less about the games that are running at that moment. Results show a significant difference between the answers of both populations.

Table 14: Moving to a specific table by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q19. A spot opens on a six-max NLH table where 5 players sit with 23/19 stats. Do you join the table?			
- Sporadically	49,8	50,8	50,1
- Sometimes	13,5	25,0	17,2
- Frequent	6,2	9,7	7,3
- This is not something I take into account when finding a table to play at	**30,5**	**14,5**	25,3

Total N = 383
* significant at a 99% confidence level (P=0,001)

The most interesting outcome is that 30,5% of the recreational players does not practise table selection, making use of player statistics, and only 14,5% of the professionals does not. These percentages are consistent with idea that professional players will put more effort and determination in finding the most lucrative tables to play at. Practising table selection also indicates the way risk is taken. Professional players do engage in activities that bring risk with

them (playing poker), but they will always find the discipline to look for the optimal (less risky) option to put their assets on.

Reward systems

Reward systems are an important factor of the game of poker to consider as they can increase a player's earnings, but also attract other skilled players to the poker sites. As professional players play large volumes of hands every month, a decent rakeback deal can result in a substantial semi-fixed extra income every month. However, if a poker site offers high rakeback percentages, other professional players will join the site and the average level of skill will increase.

Table 15: Playing with or without rakeback by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q20. Do you play at poker sites that do not offer rakeback or some other reward system (<5% RB)?			
- Never, I don't play without rakeback or other bonus system	42,5	50,0	44,9
- Occasionally, because there are plenty alternatives	25,6	27,9	26,3
- Frequently, sites like these are fine as 3rd or 4th site to play at	18,9	13,1	17,0
- Quite often, I always look for small sites in the margin	13,0	**9,0**	11,7

Total N = 376
* not significant

Table 15 shows that there is no significant difference between recreational and professional players when it comes to reward systems. Half of the professional players only play at sites that offer rakeback and only 9% of them are willing to give up rakeback in order to play at the small sites with unskilled players. Also 42,5% of the recreational players claim that they only play at sites with rakeback, and since professional players will always play where the weak players will be, might this be the reason why this many professional players play at sites with high rakeback percentages.

Personal characteristics

Professional poker and relations

Combining professional poker and a relation/family can be difficult. Because of this, it is expected that professional poker players will fewer engage in (long term) relationships. Results in table 16 however, do not show a significant difference between relationships of

recreational or professional players, despite of the discomforts. These results are surprising and show the ability of professional poker players to overcome problems that cross their path.

Table 16: Having a relationship or not by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q4. Are you in a relationship?			
- No	**50,2**	**48,4**	49,6
- Yes, shorter then two years	15,8	15,9	15,9
- Yes, longer then two years	34,0	35,7	34,5

Total N = 391
* not significant

No significant evidence was found that professional players have troubles to maintain a relationship. The results to Q5, which are shown in table 17, do show a significant difference in the living situation of recreational and professional players. The results show that more professional players live alone (28,6% vs. 21,1%) and more often live together with friends (23,8% vs. 15,5%). As for recreational players, 33,6% lives with their parents, compared to 19,8% of the professional players. One of the most obvious factors to explain this, is the fact that professional players more likely have the funds available to move out of their parents house and find a place of their own, or with friends. A second reason could be that parents rather not see their spouse playing poker all day and that this is an incentive for serious players to move out. The percentages of players living together with their partner (and children) are roughly the same, this is in line with the also identical percentages of both type of players being in a relationship. It seems that being a professional poker player does influence the living situation of players, but only until they get in a relationship at which point no significant differences are found. The results show an independent attitude of professional players, which differs them from recreational players.

Table 17: Living situation by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q5. How is your living situation?			
- I live alone	21,1	**28,6**	23,5
- I live with my parents	**33,6**	19,8	29,2
- I live together with friends	15,5	**23,8**	18,2
- I live together with my partner (and children)	26,4	26,2	26,3
- Other options/something else	3,4	1,6	2,8

Total N = 391
* significant at a 95% confidence level (P=0,019)

Level of education

Professional poker players need to be intelligent, but it is argued that most of them are not highly educated. Table 18 shows the results to the question 'What is your highest graduated level of education?'.

Table 18: Level of education by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q3. What is your highest graduated level of education?			
- Basis school	3,0	2,4	2,8
- VMBO	2,6	0,8	2,0
- HAVO	14,0	**22,2**	16,6
- VWO	26,8	**38,9**	30,7
- MBO	10,2	4,8	8,4
- HBO	20,8	15,9	19,2
- WO	22,6	15,1	20,2

Total N = 391
* significant at a 95% confidence level (P=0,016)

A significant difference is found between the level of education of recreational and professional players. Although it seems that a large percentage of the professional players has (only) finished a high level of high school, which is consistent with the theory, a critical note must be placed by the results. A population that consists of 8,4% MBO educated, 19,2% HBO educated and 20,2% WO educated respondents is far from representative for the real world. The data does, however, show that professional poker players are intelligent persons, which is again consistent with the literature.

Performing sports

Literature did not provide a conclusive idea whether a professional poker player is expected to practise more or less sports, compared to recreational players.

Table 19: Engagement in sports by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q21. Do you engage in sports?			
-Yes, an individual sport	32,7	36,1	33,8
-Yes, a team sport	24,4	23,0	23,9
- Yes, both an individual and a team sport	19,7	23,8	21,0
- No, I don't do sports	23,2	17,2	21,3

Total N = 376
* not significant

Arguments in favour of both statements can be made and the results as shown is table 19 do not provide a significant answer to this matter. Overall, professional players seem to participate a little more in sports, but as the results are not significant, no conclusive answer can be found.

A professional(s) view on poker

Many facets of the game of poker have been discussed, but is there one to pick that is considered the most important, and have professional players a different opinion about this compared to recreational players? Table 20 shows a significant difference in what both type of players find truly important in poker. Results show that 64,2% of the total population considers 'discipline and mental strength' the most important aspects of poker and for both groups this is the most chosen answer: 57,9% for recreational players and 77,5% for professional players. Still 30,2% of the recreational players find 'pleasure in poker' the most important aspect of the game. Comparing this with only 13,3% of the professional population, it is clear that recreational players, more than professional players, play poker just for fun and that is exactly why they are considered recreational players. With 77,5% of the professional players choosing 'discipline and mental strength' it describes the toughness of the game and how it can wear a player out to play day in day out, with small edges and large swings in their bankroll, professional players however, seem to be able to overcome this as they still make their living out of playing poker.

Table 20: Important aspect for a poker player by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q24.What is, from your point of view, most important to a poker player?			
- Extensive mathematical knowledge of the game	7,5	7,5	7,5
- Discipline and mental strength	57,9	**77,5**	64,2
- Plenty of time available to play	4,4	1,7	3,5
- Finding pleasure in playing poker	**30,2**	13,3	24,7

Total N = 372
* significant at a 95% confidence level (P=0,029)

Conclusion

With the 2003 poker boom, a new kind of career possibility emerged. That of the life as a professional (online) poker player. In the Netherlands, a substantial group of persons adapted the game of poker and are now able to make a living out of playing poker. New empirical evidence shows that it is far from just 'being lucky' that makes these players so successful. It shows that being a professional poker player can be highly demanding and that it is not a career laid out for just everyone.

Professional poker players have unique qualities, but there is no possibility available to prove their qualities as professional poker players do not get diplomas or certificates for playing professional poker. These qualities however, provide them with an interesting outside option on the labour market away from poker. This is relevant to both the professional players and to the corporate world as professional players will most likely not play poker for the rest of their lives and, at some point, will enter the labour market. At this point it is important that both parties acknowledge the qualities and characteristics of professional poker players.

Characteristics of the poker game

A majority of the professional players play poker over 10 hours a week, with many over 20 hours a week. Combined with other poker related activities, this makes playing professional poker an almost full time occupation. It seems fair to conclude that professional poker players are used to dedicate much of their time to their business and are likely to do so in their next career.

Professional players play significantly more tables simultaneously when compared to recreational players. This shows the ability to focus and to deal with large amounts of information in a short time. These are qualities that are demanded frequently in the higher ranks of the corporate world and are therefore valuable assets of professional poker players (Mieras, 2008).

Improving ones game and results

Professional players have a significant better understanding of the statistics and mathematics that come with the game of poker when compared to recreational players. This reveals the analytical capacities of professional players in which they are likely to excel.

Professional players watch significantly more poker instruction videos and they more often make use of supporting software while playing poker. They seem eager to improve their poker game. Most of all this can be explained as they depend on poker financially, but it also shows their willingness to develop and improve themselves in further careers.

As expected, results show that recreational players more often lose their bankroll in poker. Professional players do bust their bankroll from time to time, but not as frequent as recreational players. Being able to maintain a bankroll and to deploy bankroll management shows the ability to manage assets and only take well calculated risks with it. These are qualities that are asked for in the financial industry (Brody, 2011).

Table selection is applied significantly more by professional players, which was to expect as professional players also tend to use supporting software more often. Table selection indicates discipline and dedication to keep searching for the most profitable options and reducing the risks at the same time.

A poker player's environment and character

Literature describes the possible difficulties professional poker encounter when maintaining a relationship. No evidence, however, was found that professional players less often engage in relationships compared to recreational players. This shows that professional players are able to overcome the difficulties that arise on their path and will always search solutions to their difficulties. Related to that is the fact that there is no evidence that professional players more or less often live together with their partner. Significant evidence, however, is found that professional players more often move out of their parents house in order to live on their own or with friends. The better financial situation of professional players can explain this, as young recreational players do not have enough funds to find a place on their own. Playing poker is an individual business, this combined with professional players more likely to move out of their parents house, indicates high responsibility and independency of professional poker players.

Results show that professional poker players are intelligent people as they graduate from high school at a high level. Many professional players, however, have not (yet) finished their education after they finished high school. This can partially explained by the fact that many professional players start to play when they are attending universities and poker consumes a lot of their time, pushing forward the date on which they graduate. They do however, show a high level of intrinsic intelligence.

Literature is not conclusive whether professional players are expected to engage more or less in sports as compared to recreational players. Professional players are considered highly competitive and physical exercise should help their mental state of mind, but results did not find a conclusive answer. It seems that professional players show a similar attitude towards sports as recreational players, although their competitiveness is acknowledged.

Both type of players claim that 'discipline and mental strength' are the most import factors to consider when they strive to become successful in poker. More professional players share this opinion as also a significant group of recreational players claim that 'finding pleasure in poker' is their most important factor when it comes to poker. These results acknowledge the mental pressure that professional poker players are able to deal with, which make them less sensitive to stress and pressure that comes with demanding careers.

This study shows that professional online cash game poker players posses several qualities and characteristics which can be highly valuable in other career segments besides poker. Since many professional poker players have yet to graduate from university, it is important that these qualities are recognized as it would be undesirable to let them go to waist. The moment will come that many of the professional poker players will quit poker and apply for other careers and this thesis aims to acknowledge their qualities.

Discussion

The idea for this thesis came up after reading the book Ace on the river by Barry Greenstein (2005). Greenstein is a well known and respected (live) professional poker player who, in this book, discusses all the elements he thinks a professional poker player should possess and keep in mind in order to be truly successful in poker. It is the author's opinion that many of these elements are not restricted by poker solely, but also have their value outside the poker industry. Others have also written contributions to this subject, but the theory has yet to be tested to the reality and that is what this papers aims to do.

This thesis shows the possibilities a dedicated (professional) poker players has available to improve his poker results. It shows that, if properly prepared, the advantage of the professional player over the recreational player can be enormous. This could raise the question if the game is still fair. The cards are always fair (in the long run), it is the fact that prepared players make *better* decisions *more often* that makes them win money systematically. These players have put in money, time and dedication to achieve these advantages over other players and the question is whether this differs from more mainstream careers.

Some results from this thesis are less polarized then expected, e.g., the fact that over 50% of the recreational players claims to use a database program is much higher than one might expect. The main reason for this, as stated before, is the fact that the population used for this thesis is conducted out of visitors of Dutch online poker forums. Recreational players that take the time and effort to visit and post on poker forums cannot be considered as average recreational poker players. The recreational population used for this research weights heavily towards the top end of the total recreational poker population and that is why the results at some point might not be as polarized as expected.

The focus of this thesis is on Dutch online professional cash game poker players and the question is to what extend the results will differ when using a different focus. The (professional) Dutch poker community is to a large extend similar to those of Germany and the Scandinavian countries. All of them house a couple of well respected online high stakes cash game players, several winners of prestigious live tournaments and a fairly wealthy population with recreational players that can spare some money to play poker with. It is therefore to expect that results will not differ greatly if this research were to conduct in one of

these countries. As for the cash game focus of this thesis, tournaments are a different form of poker and the way the winnings are distributed differ substantially. In cash games, winnings are more smoothed out and every month is, given some interval, more or less the same. In tournament poker winning are either relatively small or very high. This makes for great variance in monthly results and therefore makes it harder to define a player as a losing player, breakeven player, winning player or big winner. It is the author's opinion that a thesis on professional tournament players should take into account other facets of the game, which make this thesis not applicable for tournament poker players.

As a final comment, the author hopes that this thesis will contribute to the acknowledgment of poker as a game of skill and that professional poker players will be treated accordingly by the Dutch law. The grey area poker is currently defined in is neither good for the players, the suppliers of poker and the government. This thesis shows that poker can be approached as a game of skill, as long as one is dedicated enough to invest in the game. And that professional poker players are equipped with qualities which can be valuable to others.

Glossary

Bankroll: The amount of money a player has made available to play poker with.

Big blind: A mandatory bet of a certain stake that is passed on the next hand.

Cash game: Playing poker directly for money. The value of the pot equals the real value.

Community cards: The cards that are dealt face up on the table and which belong equally to each player active in the hand.

Flop: The first 3 community cards dealt in a Texas hold'em or Omaha game.

Full ring table: A poker table where nine or ten people can be seated.

Heads up: Poker versus only one opponent.

Hole cards: Any cards dealt face-down to a player and which are for that player's use only.

M: The stack-blind ratio. (Harrington 2005)

Mucked cards: Cards that or thrown away in the pot face down after losing a show down.

Off suit: Two cards that do not match symbols. (Clubs, hearts, spades and diamonds).

Rake: A percentage extracted from the pot by a house dealer/ online poker room.

Range: A combination of possible hands.

Rebuy-tournament: Tournament where players can buy new or extra chips for a certain period of time.

Six max table: A poker table where up to six players can be seated.

Small blind: A mandatory bet of half the big blind, which is passed on every next hand.

Suited: Two cards of matching symbols.

Tell: A physical mannerism, whether voluntary or involuntary, that gives other players clues about your hand. Two great books on this subject are Mike Caro's book of tells and Read'em and reap by Phil Hellmuth and Joe Navarro.

Thin valuebetting: Betting hands that others might check in the hope that someone calls that bet with a weaker hand than yours.

Tournament: A poker form played as a knockout competition, where if one loses all their chips is eliminated from the tournament.

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Appendix 1: Optimizing a player's winnings

E.g., if a player has a winrate of 10bb/100 at $0.5/$1 stakes and a 2bb/100 winrate at $5/$10 stakes, his winnings per 100 hands will be 10x$1 = $10 at $0.5/$1 and 2x$10 = $20 at $5/$10. This player should play at $5/$10 since $20/100 hands is better than $10/100 hands. Even though the winrate at the higher limit is much lower than at the lower limit, the actual winnings are higher at the higher stakes table. However, a low winrate at high stakes might be preferable over a high winrate at low stakes moneywise, but a low winrate implies larger swings in a player's bankroll over longer periods of time and longer periods of break-even play.

If a player has a winrate at a certain limit of 5bb/100 and at a online table 50 hands/hour are dealt, he would win 2.5bb per hour playing. If this player would play 2 tables simultaneously he would win: 2 tables x 50 hands/hour = 100 hands per hour = 5bb per hour and if this player would play 24 tables at the same time he would win 60bb/hour (N.B. online tables deal approximately between 60-90 hands per hour) (Kennyseven, 2007).

Appendix 2: Questionnaire

Deze enquête bestaat uit 24 multiple choice vragen en is volledig anoniem.
De antwoorden zullen uitsluitend voor mijn onderzoek gebruikt worden, jullie privacy is derhalve gewaarborgd.

1. Wat is je leeftijd?
        A) 0-17 jaar
        B) 18-25 jaar
        C 26-35 jaar
        D) 35 jaar of ouder

2. Wat is je geslacht?
        A) Man
        B) Vrouw

3. Wat is je hoogst afgeronde opleiding?
        A) Basisschool
        B) VMBO
        C) HAVO
        D) VWO
        E) MBO
        F) HBO
        G) WO

4. Heb je op dit moment een relatie?
        A) Nee
        B) Ja, korter dan twee jaar
        C) Ja, langer dan twee jaar

5. Hoe is je woonsituatie?
        A) Ik woon alleen
        B) Ik woon bij mijn ouders
        C) Ik woon samen met vrienden
        D) Ik woon samen met mijn partner (en kinderen)
        E) Anders

6. Wat is je voornaamste dagelijkse bezigheid?
        A) Studie
        B) Werk
        C) Pokeren
        D) Anders

7. Speel je vaker poker online of live?
        A) Online
        B) Live
        C) Beide ongeveer evenveel

8. Welke spelvorm speel je voornamelijk?
        A) Cashgame
        B) Multi tafel toernooien
        C) Sit and Go toernooien
        D) Geen duidelijke keuze te maken

9. Welke pokervariant speel je voornamelijk?
        A) No limit Texas Holdem/ Pot Limit Texas Holdem
        B) Limit Texas Holdem
        C) Pot limit Omaha
        D) Een andere variant

10. Op welke limieten speel je voornamelijk?
        A) Cash: 2NL tot 10NL
        B) Cash: 25NL tot 50NL
        C) Cash: 100NL en/of 200NL
        D) Cash: vanaf 400NL
        E) Ik speel voornamelijk toernooien

11. Hoeveel uur per *week* speel je poker gemiddeld?
        A) Tot 5 uur per week
        B) Tussen de 5 en 10 uur per week
        C) Tussen de 10 en 20 uur per week
        D) meer dan 20 uur per week

12. Hoeveel handen speel je gemiddeld per *maand*?
        A) Minder dan 2500 handen
        B) 2500 tot 10.000 handen
        C) 10.000 tot 25.000 handen
        D) Meer dan 25.000 handen
        E) Weet ik niet
        F) Ik speel alleen MTT's en SNG's

13. Op hoeveel tafels tegelijk speel je gemiddeld?
        A) 1 tot 2 tafels
        B) 3 tot 4 tafels
        C) 5 tot 6 tafels
        D) 7 tot 8 tafels
        E) 9 of meer tafels

14. Zou je een grove schatting willen maken van je gemiddelde bruto maandelijkse poker-resultaat over de afgelopen 12 maanden waarin je jouw normale volume handen hebt gedraaid (dit is inclusief rakeback en bonussen)?
        A) Minder dan $0 per maand
        B) $0 tot $250 per maand
        C) $250 tot $1000 per maand
        D) $1000 tot $3000 per maand
        E) Meer dan $3000 per maand
        F) Sorry, dit houd ik privé

15. Hoe vaak per maand kijk je een pokerinstructievideo op een van de vele sites hiervoor?
    A) Zelden/nooit
    B) Minder dan 1x per maand
    C) 1 à 2x per maand
    D) Vaker dan 2x per maand

16. Hoe vaak ben je online broke gegaan?
    A) Nooit
    B) 1 à 2 keer
    C) 3 tot 6 keer
    D) Vaker dan 6 keer

17. Maak je tijdens het spelen gebruik van poker ondersteunende software?
    A) Nee
    B) Ja, maar alleen een databaseprogramma met hud (HM, PT)
    C) Ja

18. Hoe ziet een top 10% NLH preflop range eruit (in Pokerstove)?
    A) {88+,AJs+,KQs,AKo}
    B) {88+,ATs+,KTs+,QJs,AJo+}
    C) {77+, A9s+, KTs+, QTs+, AJo+, KQo}
    D) {77+, A7s+, K9s+, JTs+, ATo+, KTo+, QJo}
    E) Geen idée

19. Er is een plek vrij aan een six-max NLH tafell waar 5 spelers zitten met 23/19 statts.
    Ga je aan tafel?
    A) Zelden
    B) Soms
    C) Regelmatig
    D) Hier kijk ik doorgaans niet naar

20. Speel je op pokersites waar geen rakeback of rewardsysteem is (<5% RB)?
    A) Nooit, ik wil altijd rakeback of een ander bonussysteem
    B) Zelden, er zijn genoeg alternatieven
    C) Regelmatig, deze sites zijn prima als 3^e of 4^e site
    D) Vrij vaak, ik zoek vaak naar kleine sites in de marge

21. Doe je aan sport?
    A) Ja, een individuele sport
    B) Ja, een, teamsport
    C) Ja, zowel een individuele- als een teamsport
    D) Nee, ik sport niet

22. Hoe groot is de kans dat je met een pocket pair een set flopt?
    A) 7,33%
    B) 8,33%
    C) 12,33%
    D) 13,33%
    E) Geen idee

23. Speel je met een 'stop-loss' van X Buy-in?
        A) Ja en daar houd ik mij altijd strikt aan
        B) Ja, maar soms houd ik mij hier om verschillende redenen niet aan
        C) Nee, er zijn andere zaken die stoppen/doorgaan moeten beïnvloeden
        D) Nee, niet standaard, maar het kan voorkomen dat ik er één instel
        E) Geen idee

24. Welk van de onderstaande eigenschappen is in jouw ogen het belangrijkste voor een pokerspeler?
        A) Uitgebreide wiskundige kennis van het pokerspel
        B) Discipline en mentale hardheid
        C) Voldoende tijd om te kunnen spelen
        D) Plezier in het spel hebben

- Bedankt voor het invullen van de enquête -

Appendix 3: Additional tables

Table A1: Hours of poker played by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q11. How many hours per week do you play on average? *			
- Till 5 hours a week	32,1	7,9	24,3
- Between 5 and 10 hours a week	35,5	15,9	29,2
- Between 10 and 20 hours a week	24,2	39,7	29,2
- More then 20 hours a week	8,3	36,5	17,4

Total N = 391
* significant at a 99% confidence level (P=0,000)

Table A2: Amount of tables played by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q13. On how many tables do you play simultaneously? *			
- 1 or 2 tables	20,4	5,6	15,6
- 3 or 4 tables	37,4	13,5	29,7
- 5 or 6 tables	23,4	28,6	25,1
- 7 or more tables	18,9	52,4	29,7

Total N = 391
* significant at a 99% confidence level (P=0,000)

Table A3: Watching instruction video's by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q15. How often do you watch a poker instruction video on one of the many sites available? *			
- Sporadically/never	54,2	32,8	47,3
- Less then once a month	17,0	16,0	16,7
- Once or twice a month	17,4	19,2	18,0
- Three times a month or often	11,4	32,0	18,0

Total N = 389
* significant at a 99% confidence level (P=0,000)

Table A4: Busting the online bankroll by recreational- and professional poker players (in %)

Question	Recreational poker player	Professional poker player	Total
Q16. How many times have you busted your online bankroll? *			
- Never	41,7	55,2	46,0
- Once or twice	26,9	28,0	27,2
- 3 till 6 times	10,6	11,2	10,8
- More then 6 times	20,8	5,6	15,9

Total N = 389
* significant at a 99% confidence level (P=0,001)

Appendix 4: How to read a range

A top 10% preflop range can be defined as {77+, A9s+, KTs+, QTs+, AJo+, KQo}. Table A5 explains what this means.

Table A5: How to read a range

Notation	Represents
77+	a pair of sevens or any higher pair (88 till ace ace/AA)
A9s+	ace-9 suited or any higher suited ace (ace-ten suited till ace-king suited)
KTs+	king-ten suited or any higher suited king (king-jack suited and king-queen suited)
QTs+	queen-ten suited or queen-jack suited
AJo+	ace-jack off suit and higher off suit ace (ace-queen off suit and ace-king off suit)
KQo	king-queen off suit