

THE NEURAL STRATEGY

***THE PROVEN METHOD OF
BEATING THE CASINOS!***

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INTRODUCTION

Casino games are probably one of the least studied and most written about money making strategies in the modern world.

There have been a number of books written on casino games, but with the possible exception of blackjack, most of the authors apply little, if any of the scientific approach to the games.

The authors will invariably take one of two approaches to discussing such casino table games as craps, roulette and baccarat. For approach one, they will discuss the rules of how to play the game, and then dismiss the possibility of winning because of the casino edge over the player. For approach two, they will present a recommended playing strategy without any evidence whatsoever that it works.

Most of the so-called respectable books, such as are found in book stores, follow the first approach. This is a noncontroversial way to handle the subject of casino gaming: *since most experts agree that the games can't be beaten, they dismiss the possibility of winning out of hand.*

For approach two, which many of the fly-by-night operators delight in selling, a "winning" system is presented which the author claims he has used to beat the game. No evidence is presented that the system works, or explanation offered as to why it should work. Considering the almost universal worthlessness of this second category, I fully expect to see a pamphlet out any day promoting the bio-rhythm approach to winning at roulette.

For several years, I have devoted considerable time and resources to analyzing casino games and to devising systems and strategies which do allow the player to win. Hopefully, I have helped pioneer a third approach to casino gaming, one which recognizes the validity and risk of the house edge, but which uses analysis, testing and actual time playing to test and develop strategies to overcome the house edge.

When I first began studying and analyzing casino games nearly all my research was done by playing and recording my experiences at casino games. Some of you may recall that for my first book on craps I used a craps table set up in my home for testing thousands of craps decisions. This research resulted in *The Silverthorne System - A Casino Craps Winning System*.

This system is just as valid today as it was when it was developed almost four years ago, and on a recent trip to Las Vegas, my partner and I used it with great success to relieve the casinos of some of their cash.

As I continued to develop and test gambling systems, I discovered the use of the computer. Actually, I have used computers since the late 1960s, but I did not begin applying computer technology to testing gambling systems until fairly recently. And I have never abandoned what computer people call "real time" testing, which in the case of casino games, means actually using the system in casinos.

The Neural Strategy is the product of a combination of computer testing and using the strategy in the casinos. I believe that it meets my self imposed test of recognizing the risk of the house edge, but using a disciplined and understandable approach to overcome it.

My wife commented to me some years ago on the similarities between casino gaming and speculating in commodity futures markets and options markets. She pointed out, and I think correctly, that for a knowledgeable participant, *there is less risk speculating in casinos than in the established futures markets.*

In many ways, commodity futures markets and the options markets are very much like the casino games of chance of roulette, craps and baccarat (I have excluded blackjack in this comparison as blackjack is more properly characterized as a game of skill, although this difference in character does not mean that it is less risky than the games of chance, even if played skillfully).

Statisticians consider the futures and options markets as well as the casino games of chance to be *zero-sum games*. In a zero-sum game the amount won by one player is lost by another, so that the sum of all wins and losses is zero.

Study of this concept concerns a branch of mathematics called the *Theory of Games* and is not limited to parlor games or gambling games; it has been applied to economic planning, business management, studies of social behavior and even war.

In a two person zero-sum game, you can not have two winners. There is only one winner and one loser. This is analogous to the futures markets in that each seller of a contract must be matched by a buyer. If the seller makes money on the contract, the buyer will lose money.

With casino gaming, a player matches his skills and bankroll against the house. If the player wins a game, the house must lose.

The rules of this game are complicated by transaction costs, charged to all the participants as a fee for being allowed to play the game. With the futures and option markets, the largest transaction cost consists of the brokerage fees. With casino gaming, the "fee" is the house edge the casino has over the player.

In either case, these costs can considerably raise the risk of the game. I recall analyzing a three month trading period in which I had broken even, using a complex commodity futures trading system, which entailed a considerable amount of trading. I was virtually even after three months of trades, yet looking at the gross amounts I had received from my trades, the indications were that I should be up about \$5,000. Analyzing all of the trades showed that the transaction costs were about \$5,000 for this three month period. In other words, the broker had made \$5,000 for doing very little work, while I had spent many hours analyzing and tracking my positions, only to break even. In this case I had won the zero-sum game (I had won more than my opponents) but still managed not to come out ahead because of these transaction costs.

With casinos, the transaction costs come from the mathematical advantage the casino has over each bet. Like the brokerage houses, this advantage occurs as the casinos do not pay off bets at full correct odds. By withholding a little of the payoff, they extract a commission on each winning wager.

The effect of these transaction costs is considerable. Numerous studies have shown that about ninety percent of the commodity and options markets speculators lose money. I don't have any reliable statistics for casino gamblers, but I suspect the percentage is about the same. And the primary reason for these losses is the transaction costs.

Nonetheless, speculation in futures markets continues to grow, both in the numbers of participants and in the arsenal of tools used to give the players an edge.

Participation in casino gaming also is growing, but in general there has been very little valid research to help the casino gamblers. And this is really sad, because in many ways the casino gamblers have a decided advantage over the futures market speculators. I have been a successful speculator and a successful gambler, and without a doubt, winning at casino gaming is easier, and as for me, at least as pleasant as participating in the futures markets.

Let's look at some of the advantages that casino gaming offers over futures speculating.

Risks are more manageable with gaming than with speculating. If I bet the pass line at craps, I know that the house will pay me even money on a winning wager, or remove my chips if the bet loses. This bet has a definable risk for a fairly short duration. If I have studied craps, I know that the casino has a built-in transaction cost for this wager of 1.4%. And I know that in no case will the casino require me to put up more money just to maintain my position. I can not be locked into this wager, nor into a pattern of having to wager the pass line, and I can leave any time I please. Some of these advantages are not shared by our brethren in the futures markets.

For one thing, we can't even be sure how much we are risking when we take a position. Let's say that we call Joe, our broker, and tell him to buy ten Standard and Poors 500 Index contracts at market. We won't know what our cost of this position is until Joe calls us back with a confirmation that we bought the contracts at such and such price. In many cases, we experience *slippage* where our cost is slightly higher than we anticipated, or if we are selling, our sales price is lower than we expected. We can try to correct this by entering *limit orders* where we tell Joe to only buy at a price of 430 or better, but then we may miss a rally and not buy at all. Most traders will tell you that slippage is not that great a factor in determining your success or failure, but the plot thickens.

Assume we bought our positions at more or less the amount we expected, and now we are ready to sell. If the trading market for our particular option is thin (too few buyers), we may not be able to sell at the price we want, or even sell when we want because there may not be any buyers available.

If we have a major market disruption, such as Black Monday on October 19, 1987, when the Dow index fell 508 points, we may not be able to sell at all.

And we are constantly at the mercy of the brokers, regulators and commodity exchanges. After Black Monday, the margin requirements for trading options were raised by most brokerage houses from an average of about 5% to about 30%. If you were trading with \$10,000 used to meet the margin requirements, you would have found your entrance fee, in the form of margin, increased six times to \$60,000. Many speculators, faced with such a sudden and unanticipated demand for an increase in the capital employed, would have been forced to liquidate their positions *win or lose*. This was *not* the same game as when you started.

In extreme cases, a regulatory agency may restrict the rights you thought you had with a particular security. The Options Clearing Corporation, for example, may, under its authority, prohibit the exercise of options before the expiration date. Such an action could lock you into a loss position.

There is no question of a legal American casino ever changing the rules in the middle of the game. You can determine your bet amount before wagering. The payoff of the wager is certain if the wager wins. You can't be locked into a situation where your bet is frozen for an indefinite time period and you may be forced to put up more money to even keep your wager. *And you will always be allowed to collect a winning wager at a known transaction cost.*

In many ways, the casino wager is a safer wager than a wager made in the futures markets.

Yet the methods of analyzing the futures, options, stock and bond markets continues to proliferate as speculating or investing in these markets is considered sophisticated and "smart" while casino gaming, with the possible exception of blackjack, are considered "sucker" games and by inference, the participants not serious about their speculating.

Some of the technical indicators being used to analyze securities and futures markets are: *Andrews' Pitchfork, Black-Scholes Index, Bollinger Bands, Commodity Channel Index, Correlation Analysis, Cycle Analysis, Delta Factors, the Demand Index, Fibonacci and Time Series Forecasts, Gann Angles and Grids, Japanese Candlesticks, Linear Regression Analysis, Multiple Regression Analysis, Momentum Tracking, Moving Averages, Open Interest Measures, Point and Figure Graphing, Price Oscillators, Price Rate of Change Measures, Price and Volume Trends, Quadrant Lines, Relative Strength Comparisons and Indexes, Speed Resistance Lines, Standard Deviation Analysis, Stochastic Oscillators, the Swing Index, Time Series Forecasts, Tirone Levels, Trendlines, Volatility Indicators, Volume Oscillators and Zig-Zag Analysis.*

And what do we have for analyzing casino games? Many experts refuse to analyze the casino games, as they believe that they are unbeatable. And charlatans make amazing claims for untested and in many cases, darn-right dangerous systems and unproven money making schemes.

The approach I have used to develop the *Neural Strategy* is just as thorough as the researchers of securities and futures markets and will apply some of the same techniques to analyzing the casino games of chance.

In approaching this assignment, I assumed that I knew nothing except the rules for roulette, craps and baccarat. I did not start out with any preconceived notion of what it takes to beat these games.

My hypothesis was that a technique or series of techniques could be developed to win, betting on the even money bets offered by these games.

With such a massive and open-ended problem facing me, I turned to our electronic friend, the computer, to assist me with the analysis. I anticipated that this project would probably require "playing" millions and millions of casino decisions, and only with a computer could a problem of this scale be managed in a reasonable time framework.

To handle this analysis, I used a powerful new method of dealing with data called *Neural Networking*.

Neural networks are an advanced type of artificial intelligence in which the system teaches itself to solve problems. The internal methods by which a network performs its self-teaching had their origins in the ongoing studies of animal and human intelligence. The process entails furnishing the program with a series of input data that leads to an output event, which in turn can be used to form a prediction. The neural network then takes the series of inputs, computes its own outputs and compares them to actual results. In the process of trying to improve its ability to predict, the neural network makes changes in its approach as it "learns" from its own mistakes. This operation is repeated as many times as is necessary for the network to train itself and reach an optimal level in its ability to predict.

One of the advantages of using a neural network over other methods of analysis is that neural networks start out as essentially blank slates. Everything they learn has to be taught from scratch. This seemed to be the perfect approach for analyzing casino games from scratch as no prejudices would come with the software, and the analysis would really be from scratch.

Every variable occurring in the casino games of roulette, craps and baccarat was examined by the network. The patterns of decisions, whether to bet or skip a particular decision, the amount of bankroll to be risked, the stop losses for each session, target wins for a session, the size of bets, the sequence and pattern of wagers were all considered from ground one.

And the results surprised even me. This extensive testing showed that these casino games can be beaten, using a fairly simple system. This did not surprise me. What did take me aback was what the network decided were the most important variables for winning: *the patterns of decisions and how to bet each pattern of decisions.*

As we shall see, the strategy which was developed, using first the computer to simulate the results of playing each game, and then actual playing of the games in casinos, is most impressive. We achieved a session win rate of 84% playing craps, roulette and baccarat. And, with this high level of winning sessions, casino gaming can become a most profitable endeavor!



PROBABILITIES AND PATTERNS

The *Neural Strategy* was developed using even money wagers at craps, roulette and baccarat. For craps, these wagers were the pass line and the don't pass line, for roulette, red and black, and for baccarat, banker and player.

Many gambling systems are based on observing the outcome of casino wagers and then either betting with the trend or betting for the trend to end.

Assume that we are sitting at a roulette table and we observe that the wheel has landed on a red number for the last three spins. If we are of the school of thought that this signals that another red number is due, we will probably bet for red to repeat.

However, we may believe that any event occurring in a casino game is of limited duration and decide to wager that a black number shows, ending the streak of red numbers.

Neither of these systems has any statistical validity as the occurrences of red or black numbers on a roulette wheel are what statisticians call *independent events*.

In general, two or more events are said to be independent of each other if the occurrence of one in no way affects the probability of the occurrence of any of the others.

To give another illustration, let us determine the probability of drawing two kings in succession from a deck of 52 ordinary playing cards, without the first card being replaced before the second is drawn. Since there are four kings, the probability of getting a king on the first draw is 4/52. Given that the first card drawn is a king, the probability of getting a king on the second draw is 3/51, reflecting that we only have three kings left out of 51 cards. In this case, the probability of drawing the second king is *dependent* on the outcome of the first draw. We could calculate the probability of getting two kings in a row as:

$$4/52 \times 3/51 = 1/221.$$

If we had replaced the first card before the second was drawn, the probability of getting a king on the second draw would have been 4/52 (the same as getting a king on the first draw), and we could compute the probability of getting two king in a row under these circumstances as:

$$4/52 \times 4/52 = 1/169.$$

Since the probability of getting a king on the second draw is now 4/52 regardless of what happened on the first draw, these draws are *independent*. Generally speaking, *two or more events are independent if the occurrence of one in no way affects the probability of the occurrence of any of the others.*

If two events are independent, the probability that they will both occur is the product of their respective probabilities. With a balanced coin, the probability of getting heads is 1/2 and the probability of getting two heads in two flips is $1/2 \times 1/2 = 1/4$. The probability of getting four heads in a row is $1/2 \times 1/2 \times 1/2 \times 1/2 = 1/16$.

Returning to our example of three red numbers in a row, if we assume that the probability of spinning a red or black number is $1/2$, then the probability of the next spin being another red is $1/2$. Likewise, the probability of the next spin being a black number is also $1/2$. Because the result of each spin is independent of each other spin, we find that the previous spins have no affect on the outcome of the next spin.

If we examine this problem from a difference angle, and ask what the probability is of getting four red numbers in a row, we find that it is $1/16$, the same probability of flipping four heads in a row with a coin. If we ask what the probability is of spinning at least one black number in four spins, we find that probability is $15/16$.



With the casino games of craps, roulette and baccarat, we are dealing with independent events, where the outcome of a previous decision does not affect the following decision. With blackjack, we are dealing with dependent events, for as we saw when drawing kings out of a deck, if we don't replace the drawn cards after each draw, the probability of the next draw will change.

This is the reason that blackjack is considered a game of skill while the other casino games are considered games of chance. With skill, we can alter our strategy as the probabilities change in a blackjack deal, while with the games of chance, we should probably keep the same strategy throughout a game. (Technically, baccarat is also a game of skill as the probabilities change as cards are dealt, but because of the mechanics used for playing the game, it can for all practical purposes be treated as a game of chance, which we have done).

In each of the games of chance we will examine, the long-term probability of winning with continuous play is zero. Mathematically we can prove this, and for this reason, most experts pronounce these games as *unbeatable*.

The reason these games have been considered unbeatable is because the casino has an unvarying edge over the player in each game.

The house advantages for these games are shown on the next page. If we play any of these games on a continuous non-stop basis, it is a foregone conclusion that we will eventually lose the game because of these unrelenting house advantages.

Many persons underestimate the effect of the house advantage. Take the game of craps for instance. If the player knows that the house edge over the pass line wager is only 1.4%, he may assume that if he played with a \$100 bankroll, he should lose only 1.4% of a \$100, or \$1.40. The error of this line of reasoning is that the 1.4% applies to every wager made at the table. A player with a \$100 bankroll, betting \$5 on the pass line, will wager about \$300 per hour *if he only makes one pass line bet per dice decision*. His loss rate will be over \$4 an hour ($300 \times .014 = 4.20$). If he plays for about twenty four hours, making the same \$5 wager on the pass line, with only one bet per decision, he will probably lose his entire \$100 bankroll. This is the insidious power of even a very small house edge.

CASINO HOUSE ADVANTAGES

Roulette	Double zero	5.26%
	Single zero	2.70%
	Single zero and en prison	1.35%
Craps	Place, field, proposition bets, 1.5% to 16.7%. Pass, don't pass, come, don't come 1.4%	
Baccarat	Player	1.36%
	Banker	1.17%

With this information in hand, you might wonder why we even bother to analyze these games, if it is a foregone conclusion that with continuous play we must eventually lose the game.

The crux of the above statement is *continuous play*. While a computer might play a game continuously for thousands or even millions of decisions, we humans don't play that way. We can control our play by, for example, stopping at advantageous points, or by pulling down our wagers, to counter a losing streak. A typical statistician will tell you that these adjustments will have no effect on the long-term outcome and that it is impossible to overcome the built-in house advantage.

As was discussed in the Introduction, development of the Neural Strategy was premised upon forgetting everything we might already know about these games, including the possible outcomes, and by starting from scratch, examining the effects of all of the characteristics of these games, as well as the strategies a player might use.

In starting this project, I came with my own set of prejudices in that I have regularly and consistently beaten these games that theoretically can't be beaten; therefore I knew that a *carte blanche* acceptance of the unbeatability of the games was a faulty premise. I also was aware of the similarities between these casino games and the commodity futures markets, in which I have also had some degree of success. In short, I knew that the games could be beaten, but I wanted to research the possibilities of doing this without bringing my, or others preconceived notions into the examination, so that the *results would be as unbiased as possible.*

Using a Neural Network approach, where the network knows nothing except what it learns in the course of examining data, we proceeded to let the computer play at the games of craps, roulette and baccarat. And play it did.

Fairly early on in this process, the program realized that there was little predictive value in knowing what the last decision in a game was. If the last roulette decision was a red number, this had no predictive use for the program. This is exactly what we would expect, since each decision occurs independently.

However, the program became fascinated with patterns occurring in these games and began to zero in on identifying and betting patterns of decisions. In examining patterns, the program looked at and tested the following aspects of patterns:

a) The types of patterns of decisions. We all know that no matter how unlikely an event may be, there are times when it will occur. The program examined all patterns of decisions and identified repeating patterns of decisions, alternating patterns of decisions, and such unusual patterns as paired doublets as the most common patterns that we humans would recognize as a pattern. If we were recording decisions in a craps game, with a "p" representing a pass line decision and a "d" representing a don't pass decision, we could represent these patterns as follows:

REPEATING PATTERN	p p p p p
ALTERNATING PATTERN	p d p d p d
PAIRED DOUBLETS	pp dd pp dd

Incidentally, these patterns were also identified as the most common types of patterns occurring which will affect a player's wagering strategy.

b) The lengths of patterns of decisions (the durations). Having zeroed in on the patterns that it found significant, the program next explored the length or duration of each pattern. This is important, because if each of the identified patterns was of extremely short duration, then it would be of little use in attempting to "bet the pattern" and gain an advantage in the game. Analysis showed that for a significant amount of the time, an identified pattern would be of five to seven decisions in duration, with the exception of Paired Doublets. The computer "threw up its electronic hands" on this pattern and refused to find any optimal length for this pattern.

c) Frequency of patterns. If patterns occur very infrequently, then they are of little use in attempting to overcome the house advantage. On the other hand, if the identified patterns occur fairly frequently, then gearing our betting to a recognized pattern can be an enormous benefit. In checking for pattern frequency, the neural network concluded the following:

- 1) A great deal of reliance can be placed on a Repeating Pattern or an Alternating Pattern in the games of Roulette and Baccarat. Only a moderate level of reliability was found for these patterns with craps.

- 2) The Paired Doublet Pattern could be treated the same as a Repeating Pattern for all of the casino games. In other words, if this the Paired Pattern is recognized, then we may treat it the same way as the Repeating one.
- 3) The reliability of betting these patterns is highest in roulette, followed by baccarat, with craps coming in last.

d) Identifying Patterns. It is one thing for a computer program to tell us that it has found patterns; it is quite another to translate this information into a practical and useable form. If, for example, the software is identifying patterns using hindsight, then this information has little applicability in casinos, as anyone can beat these casinos if "hindsight betting" was allowing. We asked the system to give us a reliable way of identifying these patterns so that this information would be of real use in a casino setting. After much hemming and hawing (our neural net had a mind of its own and didn't want to be limited in the number of decisions it was allowed to observe before pronouncing that a pattern was in progress), our system decided that only two decisions need be observed for a pattern to be identified on a slightly higher than random basis.

e) Betting a Pattern. Our neural network was pleased with itself for having done so well with finding patterns, then we threw it another curve. We asked it to maximize the return possible to an investor betting these patterns. In effect we were saying, "**Ok, now we know about these patterns, so what? How do we make money with this information?**" We also added some pretty severe constraints to our computer's bankroll. Since our program had no sense about money, we wanted to make sure that when it started wagering, it had to work within the confines of a limited bankroll and a limited amount of time playing each session. We didn't want the computer to be given free rein to the extent that it might proudly tell us that if we wagered with a million dollars for forty

days and forty nights without stopping that we would win X amount. Other than giving the system a time and expense budget, it was allowed to bet as it wanted and to compare the results of each attempt so it could learn to improve its performance.

Incidentally, all of the pattern as well as the betting tests were conducted on a real time basis, where the computer was constantly faced with new decisions for each game, generated by a random number process. Many persons testing gambling systems have used static tests where one set of data, such as 30,000 recorded craps decisions, is used for testing the system. We knew that any set of fixed data contains its own biases and that our network would identify them as the best patterns. While they may be the best way to bet if you could play against the same decisions over and over, the real world doesn't offer this opportunity, so we used random numbers. If you are not familiar with this concept, think of it as the closest thing to a real life situation, where every roll of the dice, every spin of the wheel or every draw of a card presents a new and not necessarily expected outcome.

The neural network explored numerous possibilities which may be grouped in the following general categories:

- 1) **Wagering a set amount** until a pattern was identified and then increasing the wagers during the pattern.
- 2) **Increasing wagers after wins** for two, three or even more wagers.
- 3) **Increasing wagers after losses** for from two up to nine wagers.
- 4) **Betting a set amount** without variance.

The optimum results were attained when bets were **increased moderately after losses within an identified pattern.**

f) Determining the length of a betting series. After determining that we should raise our bets moderately after losses, the issue became how many times we should be willing to increase our wagers, the optimal increase for each wager and the procedures to follow after winning an increased wager. This became the crux of perfecting a winning system for each of the games selected. Because pattern recognition was the strongest with roulette and baccarat, testing showed that the same betting series and betting rules could be used for both these games, and that this would produce optimal winnings for these games.

For craps, a number of special rules were devised, in that craps did not respond in the same way to pattern identification and betting.

After much fine tuning, we became increasingly satisfied with the results we were obtaining. After all of the rules for pattern recognition and betting were identified, our system was asked to play with these sets of rules for millions of decisions. The results of this additional testing were rather spectacular, and high winnings rates were achieved in each of the games. Our winning and losing rates were:

GAME	PERCENT OF WINNING SESSIONS	PERCENT OF LOSING SESSIONS
Roulette	86.4%	13.6%
Craps	83.9%	16.1%
Baccarat	82.9%	17.1%
Weighted Average	84.0%	16.0%

The ability to recognize and exploit patterns gives us a powerful edge in attempting to beat these casino games. Does this mean that the laws of probability have been repealed? Of course not. What has occurred is that **we have identified a situation wherein certain patterns, once they begin, are slightly more likely to continue for a limited number of decisions than pure randomness would indicate.**

We will use an extreme example to illustrate this. We know that by using an unbiased pair of dice the number of pass and don't pass decisions in a craps game will approach fifty percent each if we have a large enough number of decisions. By "large", we mean hundreds of thousands or even millions of decisions. Does this mean that the pass and don't pass decisions have to be distributed evenly? It doesn't. If the course of reviewing our million or so dice decisions, we will find all kinds of unusual patterns, such as pass line decisions repeating 10, 11 or even 12 times consecutively. This is to be expected. What will surprise us is that certain patterns of dice decisions will appear at a higher rate than we would expect to find on a random basis.

Suppose that we have ten dice decisions where the Pass Line (p) occurs 50% of the time, and the Don't Pass (d) also occurs exactly 50% of the time. A purely random pattern might look like this:

p d p p d p d d p d

A less than random pattern would look like this:

p p p p p d d d d d

In each of these examples, there are five pass and don't pass decisions. What our research has shown us is that when a non random pattern, such as the strings of consecutive passes and don't passes in the second pattern above, occur *there is a slightly greater chance that the series will continue for up to seven decisions than pure randomness would indicate.*

This does not refute the laws of probability. What it does show is that certain patterns of casino decisions, such as a repeating pattern, have slightly greater durability than we would expect if such a pattern was purely random. Quite frankly, we really don't have an explanation for this. But we have confirmed that it can be exploited most profitably in the casino games of roulette, craps and baccarat.

If this sounds a little strange to you, consider the results of a seasonality study of the stock market, conducted by The Institute of Econometric Research. Their study spanned 64 years of market data and showed that the first trading day of the week (except for holidays, always a Monday) was the loser of the week. In contrast, the last trading day of the week produced the most dramatic profit.

If you had owned stocks only on the first trading day of the week for a 64 year period, you would have lost more than 99% of your investment. If you had invested \$10,000 in 1927, by 1990 it would be worth a mere \$50.

In contrast, if you invested only on the last trading day of the week, then your \$10,000 investment made in 1927 would have mushroomed to \$2.77 million by 1990.

We offer no explanation for this phenomenon either. For our purposes we really don't care why there are certain aberrations in patterns of casino decisions, nor why this pattern of daily seasonality occurred in the stock market. This is not a theoretical exercise. Our purpose is to find and exploit any phenomena which will give us an additional edge in making more money. *And the Neural Strategy does just that.*



THE NEURAL STRATEGY

The Betting Pattern

In attempting to win against different patterns of casino decisions, the computer tested many different betting patterns. A *betting pattern is defined as a predetermined series of wagers which will be made dependent upon the outcome of preceding wagers.*

There are many ways to bet in casino games, and all betting methods boil down to three major categories:

- a) Increasing the amount of a wager following a losing wager, or several losing wagers.
- b) Decreasing the amount of a wager following a losing wager, or several losing wagers.
- c) Keeping the bet the same, regardless of the outcome of previous wagers.

Each of these approaches was tested, and the most effective approach to betting was increasing bets *moderately after losses*.

In general, gambling systems which advocate raising wagers after losses may be extremely hazardous to the player's bankroll in that the player may be lulled into a sense of complacency by the numerous small wins the systems produce, and then shocked when the player's entire bankroll is lost in the course of a few consecutive losing bets.

The most common system calling for increasing wagers after losses is the Martingale, sometimes called the "double-up" system. This system is easy to use and falls into the category of systems which are very hazardous to the player's bankroll.

A Martingale system for a \$5 bettor, would consist of the following wagers: 5 10 20 40 80 160 320. The player would start out betting a \$5 chip on one of the even money casino bets. Assume that this player is playing roulette and decides to bet on red. He makes his first wager on red, and black shows. His next wager will be for \$10 on red, and so on until a red eventually shows. Most of the time, this system will produce small winnings. However, eventually, the player will lose six consecutive wagers and will be called on to wager his last and highest wager of \$320. The player is in a real predicament. He has lost \$315 at this point, and his only hope of recouping is to win the \$320 wager. If this wager wins, he will be ahead a total of \$5 for this particular run of bets. If he loses the \$320 bet he will have lost a total of \$635, wiping out many hours of small wins. With trepidation he wagers \$320, and a red finally shows. With relief his next wager drops down to \$5 and he continues. *But eventually, if he continues to wager this way, he will lose the \$320 wager, and this will happen often enough that he can't win with this system.*

If the Martingale series could be extended for two to three more wagers, so that the betting series becomes 5 10 20 40 80 160 320 640 1280, he would improve his odds of winning each session somewhat, but at a much greater risk, for now he must risk \$1,280 on his final wager in the hopes of recouping the \$1,275 lost and thus winning a net \$5.

Casinos are well aware of the Martingale system, and they impose house limits on the size of the largest wager allowed so that a player could not, if he were so inclined, continue to double each successive wager until he eventually won.

The Martingale system is defective in two ways. First, it risks too much in comparison to the amount which may be won. A \$320 wager to win \$5, or worse yet, a \$1,280 wager risked to win only \$5, is not a reasonable risk. Secondly, because of the laws of probability, this system does not have any edge in selecting the decisions for wagering. In this case, our player wagered red only, which will eventually cause him to lose his entire series of wagers.

Increasing your wagers after a winning wager has the advantage that you will never be called upon to wager larger and larger amounts to win a relatively small amount. However, increasing wagers after winning has a large disadvantage in that when you do have a losing wager, the amount lost will be large and may cost you all of your previous winnings.

Many players throw up their hands at either of the above approaches and simply wager the same amount on each bet. This approach may keep you in the game longer, but unless some advantage over the casino is gained, this approach will eventually lose.

Recognizing the drawbacks of each approach, the neural net found the following series of wagers to be the most effective betting series tested: **5 8 13 20 35 50 75 100**.

With this series of wagers, the bet is raised one level after a loss and lowered one level after a win. However, if we have two wins in a row, or we win two out of three wagers, the next wager is decreased by two levels.

The effectiveness of the Neural Pattern of betting, betting the same regardless of previous wins and losses (called flat betting) and doubling a wager after a win (called a parlay) are demonstrated in Table 1.

**TABLE 1. COMPARISON OF BETTING PATTERNS
BETTING RED IN ROULETTE**

Roulette Decision (r=red, b=black) >	1	2	3	4	5	6	7	8	Total Won
Neural Pattern	-5	-8	+13	-8	+13	-5	+8	+5	+13
Flat Betting (\$10)	-10	-10	+10	-10	+10	-10	+10	+10	-0-
Parlay Betting (\$10)	-10	-10	+10	-20	+10	-20	+10	+20	-10

In this example, all players bet only red, and won four red decisions out of a total of eight roulette decisions. The Neural Pattern was the only approach to have any winnings, with a win of \$13. Flat betting broke even, while Parlay betting had a loss of \$10.

It is instructive to consider the size of the average wager with each approach. The average size wager for the Neural Pattern was \$8.13, for Flat betting, \$10 and for the Parlay approach \$13.75. *With the Neural Pattern we wagered the least amount of money and had the highest win.*

Controlling the amount wagered while maximizing the winnings is the essence of the Neural Pattern. Those of you with a mathematics background will notice that the Neural Pattern resembles a Fibonacci Series, wherein each wager is equal to the sum of the previous two wagers.

A Fibonnaci Series for eight wagers is 5 8 13 21 34 55 89 144, for a total risked of \$369. Incidentally, this series was tested, and the Neural Pattern with only \$306 risked was found to produce higher winnings.

It will be helpful to review each of the wagers made using the Neural Pattern as shown in Table 1. Table 2 shows each wager made, with amount won or lost summarized and the betting rule used.

TABLE 2. ANALYSIS OF NEURAL PATTERN WAGERS

	Bet Made	Outcome	Amount Bet	Won or Lost	Total Won or Lost	Betting Rule
1	r	b	5	-5	-5	1
2	r	b	8	-8	-13	2
3	r	r	13	+13	-0-	2
4	r	b	8	-8	-8	3
5	r	r	13	+13	+5	2
6	r	b	5	-5	-0-	4
7	r	r	8	+8	+8	2
8	r	r	5	+5	+13	2

The betting rules used (corresponding to the rules numbers shown in the last column of the table) for the Neural Pattern are:

1. The starting wager for any series of wagers is \$5, the lowest level.
2. If a wager loses, the next wager will be one level higher.
3. If a wager wins, the next wager will be one level lower.
4. If two consecutive wagers are won, or if two out of three wagers are won, the next wager is two levels lower.

The wager for decision 1 was for \$5, as this was the first wager in the series (rule 1). Since the first wager lost, we raised the second wager to \$8 (rule 2). The decision 2 wager also lost, so, relying on rule 2, we raised our wager one more level, to \$13 for wager 3. Winning the third wager, we lowered our wager for decision 4 by one level. We lost the \$8 wager on decision 4, so for decision 5, we once again raised our wager, per rule 2. Decision 5 won, so that we lowered our wager for decision 6 by two levels, as we had won two out of the last three wagers (rule 4). We lost decision 6, so that we had to raise our wager one level for decision 7. Having won decision 7, we lowered our wager one level to \$5 for decision 8 and won that decision also.

Looking at the Total Won or Lost, we see that our greatest loss in this series was \$13 and our largest win was \$13. We also note that winning two out of three decisions allowed us to drop our wager rapidly, so that with a moderate number of wins, we were able to reduce the size of our bet rapidly.

The Neural Betting Pattern has built-in safe guards to reduce the size of your wager as rapidly as possible, while allowing for large enough wagers that you will gain an advantage from successive wins.

Session Bankrolls

Using the Neural Betting Pattern is not limited to making a \$5 minimum wager. It can be used by \$2 bettors as well as \$25 bettors. Table 3 shows the betting patterns for \$2, \$5, \$10 and \$25 bettors and the session bankroll required for each level.

You will note that the amount required for a session has been rounded in the last column for convenience in exchanging your cash for chips. For instance, the total of all the wagers in the \$5 betting pattern is \$306, which has been rounded to \$300. Likewise, the total for the \$2 betting pattern is rounded to \$120.

TABLE 3.
SELECTED NEURAL BETTING PATTERNS

Series>	1	2	3	4	5	6	7	8	Total	Rounded
\$2	2	3	5	8	14	20	30	40	122	120
\$5	5	8	13	20	35	50	75	100	306	300
\$10	10	16	26	40	70	100	150	200	612	600
\$25	25	40	65	100	175	250	375	500	1530	1500

Selecting The Wagers

At this stage in the development of the Neural Strategy, we have a betting pattern *which by itself will not beat the casino*. Unless we have an edge in selecting our wagers, we slow down the inevitable loss to the casino, but we don't prevent it. A Betting Pattern alone will not give us a winning system. We must have a way of selecting how we wager which gives us a better than random chance of selecting a higher percentage of winning wagers.

You may recall a discussion about patterns of decisions in the previous chapter when we discussed Repeating, Alternating and Paired Doublet patterns of decisions. *The purpose of identifying a pattern is to give us an edge in applying the Neural Betting Pattern, so that we may win a higher amount of wagers than we are statistically expected to win.* We found after extensive testing that with the Repeating and Alternating Patterns we could "pick" a betting pattern that would give us a statistically higher probability of winning. We also found that the Paired Doublet Pattern could be safely treated the same as a repeating pattern for bet selection.

The first step in selecting a wagering plan, is to identify the pattern we are facing in a given game. To identify a pattern we observe two decisions before beginning to wager. The pattern formed by the two decisions tells us how we should wager for the next five levels using the Neural Betting Pattern.

Assume that our game is baccarat, and we represent a player win as a "p" and a banker win as a "b". Table 4 shows the four patterns we can have in two decisions and how we will respond to each pattern.

Once we have begun betting our selected pattern we will continue to bet this pattern until we have lost the fifth level bet of our betting series. For a \$5 bettor, this is the \$35 bet, for a \$2 bettor, the \$14 bet, for a \$25 bettor, the \$175 wager. If we have lost all five levels, we will then switch our pattern to the *opposite of the wager we have been making to this point*.

TABLE 4. SELECTION OF BETTING STRATEGY

Pattern Observed (b = banker, p = player)	Betting Strategy
pp	Bet p only until the level 5 wager is lost
bb	Bet b only until the level 5 wager is lost
pb	Bet p, and if it wins then bet b. Continue to bet an alternating pattern until losing a wager. After losing a wager, continue betting only the opposite of the wager lost until the level 5 wager is lost
bp	Bet b, and if it wins then bet p. Continue to bet an alternating pattern until losing a wager. After losing a wager, continue betting only the opposite of the wager lost until the level 5 wager is lost

In testing this approach to betting, one of the numerous variations tested was the procedure to follow after losing the level 5 bet. One approach which was tested extensively and which was found to reduce the chance of winning was that of skipping wagers on the next two decisions after losing the level 5 wager and redetermining a betting pattern based on the skipped decisions. Use of this procedure actually reduced the winnings. We mention this because there are several gambling systems currently being sold which recommend skipping. *Our testing confirmed that there is absolutely no benefit to skipping decisions.*

The optimal way to handle the loss of the level 5 wager is to immediately switch to betting the opposite decision, starting with the level 6 wager. If you have been betting player in baccarat, you will switch to banker, red in roulette will switch to black and don't pass in craps switches to pass line.

There are some additional rules to be followed after switching sides at level 6.

1. Reduce the betting level two units after a win. If you win the level 6 wager, the next wager is the level 4 bet. For a \$5 bettor, using the appropriate betting series, the bet following a win of the \$50 wager is \$20, a win of \$75 is followed by a \$35 wager, and a win of \$100 is followed by a \$50 wager.
2. The wager following a win after the reduction described in rule 1 above is dropped one more level. If this wager also wins, the next wager is reduced by two levels. If the wager following a win loses, the next wager is raised one level.
3. If, after switching to a different betting pattern we win at least three wagers and then lose a level 5 wager again, we will switch our betting pattern once more.

Table 5 summarizes a series of wagers at roulette, where the previous selected pattern of betting has been red, and the \$35 wager on red has been lost.

TABLE 5. NEURAL WAGERS AFTER LOSING LEVEL 5 WAGER

	<i>Bet Made</i>	<i>Outcome</i>	<i>Amount Bet</i>	<i>Won or Lost</i>	<i>Total Won or Lost</i>
1	r	b	35	-35	-35
2	b	r	50	-50	-85
3	b	b	75	+75	-10
4	b	b	35	+35	+25
5	b	b	20	+20	+45
6	b	b	8	+8	+53

In constructing Table 5 we have ignored all bets and decisions occurring prior to the loss of the \$35 wager. All of these wagers would have been bet on red so that the loss of the \$35 wager on red represents our final wager on red at this time. On decision 1, we lost a \$35 wager betting on red as the outcome was black. For decision 2, we immediately began betting on black and continued to wager on black throughout this series.

The outcome of decision 2 was red so that we lost this wager. We continued to bet black for decision 3 and raised our wager to \$75. This wager won, *so that the wager following this win was reduced by two levels to \$35*.

We also won the decision 4 wager for \$35; therefore decision 5 *we dropped our wager one more level*. The \$20 decision also won so that *our final wager was reduced two more levels to \$8*.

Notice that even though we will drop our wager two levels following a win on a level 6, 7 or 8 wager, two consecutive wins still provide us with adequate winnings. As shown in the table, we won the \$75 wager for decision 3 and also won the \$35 decision 4 wager. The win of these two wagers more than offset our losses of the decision 1 and 2 wagers and helped prepare us to recoup any prior losses.

If we had lost the \$8 decision 6 wager, we would have resumed raising our wager by one level and the next wager would have been \$13. If this bet was also lost, our next wager would have been \$20, and if it lost also, it would be followed by a \$35 wager. All of these wagers would have been on black, as this was the pattern established when we originally lost our level 5 \$35 wager. At this point, we are in the same situation as when we switched from betting red to betting black. We have lost a level 5 wager betting black, so we will now switch back to red. Our next wager will be \$50 on red.

This betting strategy may seem somewhat complicated at first, but it is very easy to use as we will demonstrate shortly.

Controlling Wins and Losses

The Neural Strategy does not contemplate that a game will continue indefinitely. It is a "hit and run" type of strategy which can be employed over and over to build winnings rapidly. However, an essential ingredient of the strategy is that *games should be kept as short as possible*.

Determining the time to quit a game is easy, as the game is over when the target profit for the game has been reached. Target profits are always equal to one-third of the session bankroll. As shown in Table 3, the session bankroll for the \$5 bettor is \$300, so that the target win is \$100. A \$25 bettor, playing with a session bankroll of \$1,500 would plan on terminating a game when his winnings had reached \$500. A \$2 bettor, playing with a \$120 session bankroll would look for a \$40 win as a target stopping point.

Whenever a session is lost is also an immediate signal to terminate. Additional cash will never be added to a losing session so that it can be continued. Instead, the session will be terminated and if the player is wise, he will take a break from playing before resuming.

Table 6 summarizes the average number of decisions per game and also shows the shortest number of decisions to complete a game as well as the longest number of decisions required to complete a game. The average number of decisions per hour is also shown, as well as the average time it takes to complete each game.

TABLE 6. DECISIONS AND TIMES TO COMPLETE GAMES

Game	Average Decisions Per Game	Least Decisions to Complete Game	Most Decisions to Complete Game	Average Number of Decisions/Hour	Average Game Length (in minutes)
Craps	52.70	35	120	60/hr	53 min
Roulette	56.05	38	85	100/hr	34 min
Baccarat	45.50	39	71	60/hr	46 min

As shown in Table 6, roulette required the highest number of average decisions to win a game and baccarat the least (as seen in the second column). However, when we consider the number of decisions per hour played in each game, roulette required the least amount of time at the table (only 34 minutes) to complete the average game. Craps, with an average game lasting 53 minutes, took the longest time to finish an average game.

The length of the average game in minutes is dependent upon where the game is played and the conditions under which the game is played. For craps, 60 decisions per hour is about average for an uncrowded table. If the table is very full and covered with bets, the number of decisions may only be 40 or so an hour.

With roulette, the game length is based on the rapid play of American roulette wheels. The European games are much more leisurely, averaging about 30 spins per hour while the American wheels will average 100 spins an hour.

The length of an average baccarat game is based on playing Mini-Baccarat which is played on a table similar to a blackjack table, usually located on the main floor of the casino. The formal version of baccarat may be slower than the mini version.

If minimizing your playing time is your major concern, American roulette is your best bet. If you want to win with the lowest average number of decisions, you will play baccarat.

Summary of the Neural Strategy

Putting together all of the components of the Neural Strategy is surprisingly easy. There is a separate chapter devoted to each of the casino games where the strategy is used, so if you are slightly overwhelmed at this point, we shall rectify this.

The general Neural Strategy flows very easily in actual use, as our goal was not to develop a theoretical strategy to play on computers, but a realistic money making system.

1. The Betting Series. Use of a betting series is basic for employing the strategy. The series for a \$5 bettor is: **5 8 13 20 35 50 75 100**. In starting a game, always begin with the lowest wager in the series. Table 3 shows the series used for \$2, \$10 and \$25 bettors. Other than varying the size of the wagers, all other aspects of the strategy remain unchanged.

2. Selecting a Betting Pattern. The Neural Strategy is effective because of its ability to select a pattern which will be dominant for a short term period, with a greater probability than a purely random selection. We choose a betting pattern based on *observing two decisions before beginning to wager*. There is an exception to this pattern rule for craps which will be explained completely in the chapter on craps.

- a. If the observed decisions repeat such as pp or dd, we will bet that they will continue to repeat.

- b. If the decisions alternate, we will bet that they will continue to alternate until we lose a wager. After we lose a wager, we will wager that the dominant pattern will continue, which will be the opposite decision of our losing one. If we bet p d p and our third wager on p loses, we will switch to betting d and continue to bet d within the rules of the system.

3. General Wagering Rules. The wagering rules will always be followed using the Neural Strategy. These rules are:

- a. Always begin every game with the lowest level wager in the betting series.
- b. If a wager loses, the following wager will be raised by one level. If in the basic series we lose an \$8 wager, the next wager will be \$13.
- c. If a wager wins, the next wager will be one level lower, except when we have won two wagers in a row or won two out of three wagers.
- d. If two consecutive wagers are won, or if two out of three wagers are won, the next wager is two levels lower.
- e. These rules always apply when we are wagering less than the Level 5 wager *and have not changed our wager because of a loss of a Level 5 wager*. If we have changed wagers, then special rules shown below are used.

4. Special Wagering Rules for Switches. We will continue with the established betting pattern until we have lost enough wagers that we eventually lose the Level 5 wager. Many games are completed without this ever occurring; in other games we may lose the Level 5 wager more than once. After losing a Level 5 wager the wagering rules are modified until we have won at least three wagers after having switched our betting pattern. Special modifications, which will be explained are used with craps.

- a. Upon losing a Level 5 wager, we will immediately began betting the opposite of the wager previously made, that is, we will *switch* our betting pattern. If we have been betting d in craps, we switch to p, r in roulette, we switch to b, b in baccarat, requires a change to p.
- b. We will reduce our betting level by two levels after a win. If we wager a Level 6 bet of \$50 and win, our next wager is a Level 4 wager of \$20. If we lose a wager, we will raise our bet one wager, the same as is specified by the general betting rules.
- c. Following two wins, we will reduce the next wager only one level. If we bet \$50 and win, our next wager will be \$20 (reduced two levels). If the \$20 wager also wins, our next wager is \$13, *one level less than \$20*.
- d. If, after switching to a different betting pattern, we win at least three wagers and then lose a level 5 wager again, we will switch our betting pattern once again in accordance with the rules for Level 5 losses.
- e. Anytime we have had five or more decisions after switching and then lose a Level 5 wager, we should switch back to the previous betting pattern, even if we have not had the three wins called for above.

5. Controlling Wins and Losses. An essential part of the Neural Strategy is keeping each game fairly short and rigorously controlling losses. The following rules summarize this approach:

- a. We will always quit immediately if we lose the session bankroll. We will never put more chips into play.

b. We will keep track of our chips (more on this later) and quit when we have won one third of the session bankroll. It will take us, on the average, from about 35 minutes to an hour of play to accomplish a win. There are special circumstances, which we will discuss shortly, under which we may decide to ride a winning streak a bit longer and win more than one third of our session bankroll in a single game.

It is extremely important that the Neural Strategy be applied in a clinical, unemotional manner. Varying from the strategy is nearly always costly, yet because we are human beings, we can always rationalize many reasons during the course of a game why we feel we should change the strategy.

If we are betting the don't pass in craps and see three come out passes in a row, we may be tempted to switch sides or at least to skip the next decision. *All of these strategies have been thoroughly tested, and Neural Strategy, as presented, is the best approach.* You will not be correctly playing the strategy with these, or any other variations.

As we shall see when we explore each of the casino games where the Neural Strategy is used, the strategy is very effective as is and requires no modifications or improvements.



ROULETTE

Description of the Game

Roulette is played with a wheel with 37 or 38 numbers and symbols on the wheel. The numbers range from 1 to 36, with one zero on the wheels with 37 numbers and a zero and double zero on the 38 number wheels.

There is a pocket on the wheel corresponding with each of the numbers. The background for each of the numbers 1 to 36 is colored alternately either red or black. The zero and double zero backgrounds are colored green.

The wheel turns on a center axis and is designed so that a ball can be spun on the inside of a wall constructed within the wheel, so that after a number of rotations the ball will eventually come to rest in one of the pockets.

Roulette wheels will have either one or two betting areas. Most of the wheels in the United States have one betting area on one side of the wheel with one dealer, while most of the foreign wheels have two betting areas, with one on each side of the wheel, and use three dealers.



A spin begins when a dealer pushes the wheel in one direction and spins the ball in the opposite direction. The pocket the ball drops in determines the outcome of the spin.

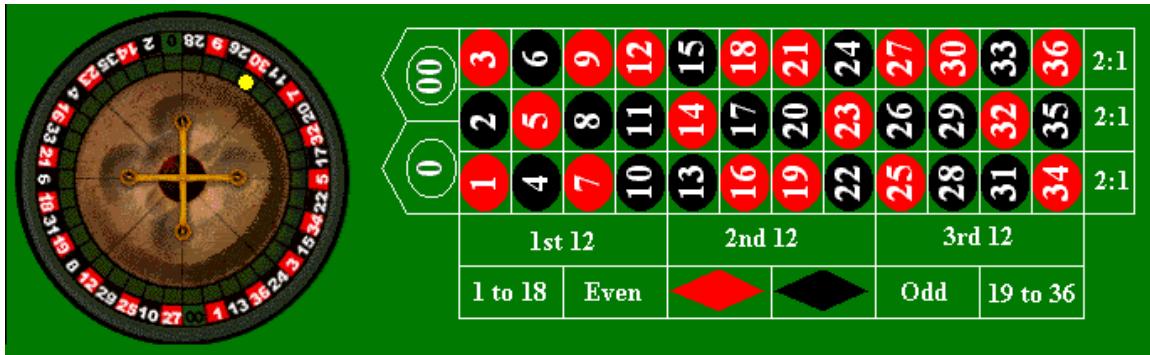
Bets are made by placing chips in the appropriate part of the betting area. In the United States, two types of chips are used at roulette.

First, the usual casino chips such as are used at craps and baccarat may be used at roulette. When using the Neural Strategy, you will normally use casino chips.

In addition, special roulette chips are offered in the United States version of roulette. These chips have no denominations on them but have different colors. When you buy into a table, say for example, buying twenty \$1 chips, the dealer will hand you twenty chips of the same color, say red. You will be the only player using red chips at this table, and for you each red chip is worth a dollar. When you buy in, the dealer places a disc indicating a value of a dollar in the red chip rack, so that the value of your chips is recorded.

If you were to hand the dealer another twenty requesting \$0.25 chips, he would give you chips of a different color.

The roulette chips have no value anywhere but at the roulette table where you are playing. When you have finished playing roulette you should exchange your roulette chips for casino chips before leaving the table. *The casino cashier will not cash in roulette chips as the cashier has no way of determining the value of the chips*, since it can vary from player to player.



In the European version of roulette, everyone plays with casino chips which can lead to some confusion when several players have wagered on the same bet and all of their chips look alike.

Bets may be divided into two groups, *inside bets and outside bets*. Inside bets are made on the numbers or combinations of individual numbers. There are thirty seven or thirty eight different numbers in the betting area (depending of whether we are playing the single or double zero version of the game), and wagers can be made on individual numbers or combinations of numbers.

A single number wager is paid off at 35 to 1. A two number wager pays 17 to 1 for a win. A three number wager pays 11 to 1, a four number bet, 8 to 1, a five number wager, 6 to 1, and a six number wager pays 5 to 1.

We are not concerned with inside bets using the Neural Strategy. Outside bets, as their name implies, are made in areas on the outside of the betting area. Wagers can be made on sections of numbers (dozens) such as numbers 1 to 12, 13 to 24 and 25 to 36. A win on a section wager pays 2 to 1.

Column bets are made by placing a chip in one of the three boxes corresponding to a column of numbers printed on the betting area. If the number spun is in the column wagered, the bet pays off at 2 to 1.

Our concern is with the *even-money bets*. There are three types of even money wagers.

Bets on red or black win if the outcome of a spin is a number with the same colored background.

Bets on even or odd win if the ball lands on a number which has the same characteristic as the wager made.

Wager on numbers 1 to 18 and 19 to 36 win if the outcome of a spin is a number within the bet selected.

The house advantage in roulette changes dependent upon the version of the game offered. In this country, two zero roulette is the most common version, in Europe and South America, the single zero version is prevalent.

In double zero roulette in Nevada, the house advantage is 5.26% of all wagers, except for the five number wager encompassing the zero and double zero where the house edge is about 7.9%. In the Nevada double zero game, every wager on the table including all even-money wagers, loses when a zero or double zero shows. In the Atlantic City version of the double zero game, you will lose only one-half of an even-money wager when a zero or double zero shows, reducing the house edge for even-money wagers to 2.63%.

With Nevada and Atlantic City single zero wheels, all wagers lose when the zero is spun, resulting in a house advantage over the player of 2.70%.



In the International single zero version of roulette, the house edge against the even-money wagers is only 1.39% when the *en prison* rule is used. With the *en prison* rule, the house only takes one-half of your even-money wager when the zero shows, or you may choose to have your wager "in prison" for the next wager, which means that you must make the same wager for the next spin. This is obviously a very good deal for the even-money bettor as the house edge is reduced by 74%, as compared with the Nevada double zero game.

Every roulette table has *maximum* and *minimum* wagers. These limits will change from casino to casino and will even change on the same table, as casinos typically raise the minimum wagers during high demand times, such as weekends and in the evening. Typical limits in Nevada and Atlantic City range from a minimum of \$1 to \$5 to a maximum of from \$500 to \$2,000. Usually the lowest value chips which may be purchased are the \$0.25 chips although some casinos offer ten cent chips.

At a \$1 minimum table, the smallest amount a player can place on an even-money wager is \$1.

When you first come up to a roulette table you should ascertain the table limits before you sit down. More than one player has been embarrassed by sitting down at a \$5 minimum table and attempting to make a \$1 wager. If the table minimum is too high, do not change your betting strategy and wager higher amounts to accommodate the table. You should *find a table which has a low enough minimum wager that you can play according to your plan, and not the casino's.*

Neural Strategy at Roulette

The Neural Strategy has achieved an astounding 86.4% session win rate played against the Nevada double zero version of the game. In testing the Neural Strategy against roulette, craps and baccarat, these results are to be considered nothing short of amazing, as the double zero version of the game with its high house advantage of 5.26% is a tough game to beat.

Consider that the Nevada double zero version has a house advantage about four times greater than baccarat or craps. In testing early variations of strategies before perfecting the Neural Strategy, we often found that strategies that worked reasonably well at craps or baccarat, failed miserably against the high odds Nevada game.



At one point, we were almost reconciled to giving up on finding a way to beat this game and confining our testing to the Atlantic City version of the game (with a house edge half that of the Nevada game).

The reason that the Neural Strategy works so well with all versions of roulette is that roulette is a very streaky game, and therefore it is particularly susceptible to the Neural Strategy. By streaky, we mean that strings of decisions where either red or black dominate are more common in roulette than streaks in either baccarat or craps. If we ranked the three games, we would find that roulette has the most streaks, with baccarat next and craps last.

With this characteristic, the Neural Strategy can be used with devastating effectiveness against roulette.

Table 7 presents a summary of twenty sessions at roulette played in Las Vegas, in both the downtown and strip casinos. These games are presented in the actual order in which they were played and are not hand picked games. All games are versus the 5.26% odds double zero game, where the player is at his greatest disadvantage. The session bankroll used was \$300 (for \$5 bettors).

TABLE 7. SUMMARY OF TWENTY 5.26% ROULETTE SESSIONS

<i>Session</i>	<i>Decisions</i>	<i>Won or Lost</i>	<i>Length (in minutes)</i>
1	49	+98	29
2	46	+98	28
3	46	+99	28
4	45	+100	27
5	38	-229	23
6	39	+100	23
7	44	+101	26
8	57	+98	34
9	51	+100	31
10	53	+103	32
11	93	-227	56
12	57	+100	34
13	78	-217	47
14	48	+111	29
15	85	+102	51
16	53	+101	32
17	82	+101	49
18	42	+98	25
19	46	+101	28
20	61	+103	37
TOTAL	1113	\$1,041	669
AVERAGE	55.65	\$52.05	33.45

Reviewing Table 7, we notice that the average length of a session was a little over thirty minutes with an average win of about \$52.00. The average hourly win for these twenty sessions was \$93.

We won 17 games and lost 3 games, for a session win rate of 85%, slightly less than our overall average win rate of 86.3%.

If we look only at the 17 winning sessions, we find that the amount won per winning game was \$100.82, very close to our target cutoff of \$100 per game.

The average loss was \$224.33 per lost game.

The total amount of playing time for these twenty sessions is a little over eleven hours. If we played roulette for somewhat less than four hours per day, these sessions would represent three days of play.

Every one of the sessions shown in the table were played in a mechanical fashion exactly in accordance with the Neural Strategy. In using the strategy it is not uncommon to have games where the decisions are very choppy, and it is difficult to find a stable pattern. The games with a greater number of decisions generally have been choppier. Sessions 8, 11, 12, 13, 15, 17 and 20 were longer than normal and were games where the pattern betting system ran into rougher sailing. A higher number of loss games occurred with these choppy games, as we lost 2 out of 7 of these games, for a win rate of only 71%. In contrast, the remaining 13 smoother games had only one loss, for a win rate of 92%.

If you are experiencing an especially difficult session, it may be advisable to stop even if your winnings are small or if you have a small loss. Game 11 was such a game. This game lasted for almost an hour, and we experienced difficulties throughout this session. We ended up losing the game anyway. It would have been more prudent if we

had called the game off after about 60 decisions. At this point in the game we were down just a few dollars, and we could have saved ourselves some time and money by doing this.

Other than calling a difficult session over even if you have not reached the target win, there is no reason to depart from the standard playing strategy.

To further illustrate how to use the Neural Strategy we have presented in Table 8 a detailed description of a game played in Las Vegas.



TABLE 8. ANALYSIS OF ROULETTE GAME

	Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
1	b	-	-	300	NA
2	b	-	-	300	NA
3	b	b-5	W-5	305	+5
4	b	b-5	W-5	310	+10
5	b	b-5	W-5	315	+15
6	0	b-5	L-5	310	+10
7	b	b-8	W-8	318	+18
8	00	b-5	L-5	313	+13
9	r	b-8	L-8	305	+5
10	0	b-13	L-13	292	-8
11	r	b-20	L-20	272	-28
12	r	b-35	L-35	237	-63
13	r	r-50	W-50	287	-13
14	b	r-20	L-20	267	-33
15	b	r-35	L-35	232	-68
16	b	r-50	L-50	182	-118
17	r	r-75	W-75	257	-43
18	b	r-35	L-35	222	-78
19	r	b-50	L-50	172	-128

	Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
20	b	b-75	W-75	247	-53
21	b	b-35	W-35	282	-18
22	r	b-20	L-20	262	-38
23	b	b-35	W-35	297	-3
24	b	b-20	W-20	317	+17
25	b	b-13	W-13	330	+30
26	b	b-5	W-5	335	+35
27	b	b-5	W-5	340	+40
28	b	b-5	W-5	345	+45
29	b	b-5	W-5	350	+50
30	b	b-5	W-5	355	+55
31	r	b-5	L-5	350	+50
32	00	b-8	L-8	342	+42
33	b	b-13	W-13	355	+55
34	b	b-8	W-8	363	+63
35	r	b-5	L-5	358	+58
36	b	b-8	W-8	366	+66
37	b	b-5	W-5	371	+71
38	b	b-5	W-5	376	+76
39	b	b-5	W-5	381	+81
40	r	b-5	L-5	376	+76

	Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
41	b	b-8	W-8	384	+84
42	b	b-5	W-5	389	+89
43	b	b-5	W-5	394	+94
44	r	b-5	L-5	389	+89
45	b	b-8	W-8	397	+97
46	b	b-5	W-5	402	+102

The left hand column in the table shows the decision number, with each number representing one spin of the wheel. This game took about 28 minutes.

The next column shows the **Outcome** of each spin. The third column represents our wager and the amount bet. For instance, decision 13 shows that we wagered \$50 on red. The fourth column **Win-Loss** shows the outcome of each spin, where **W** equals a win and **L** equals a loss. The symbol **W-8** shows an \$8 win.

The fifth column, **Bankroll** shows our bankroll at all times during this game. And the right hand column shows our cumulative win or loss after each decision.

We began the game by observing decisions 1 and 2. Since the outcome of both decisions were black, *we began betting the black pattern*. We continued betting black until decision 12 when we lost our Level 5 wager for \$35. We switched to betting red with decision 13 and continued to wager red through decision 18.

Through decision 18 we had made six red wagers and accomplished little as we lost a Level 5 \$35 wager on decision 18. Even though we had not won three red wagers (Neural Strategy general rule) we switched sides again and began wagering black with decision 19. *Anytime that we have had five or more decisions after switching and then lose a Level 5 wager, we should switch back to the original betting pattern, even if we have not had the three wins called for by the general strategy.*

From decision 19 to 46 we continued to wager only on black. Out of 46 roulette spins, black occurred on 31, and clearly dominated this session as *67% of all outcomes were black.*

An important feature of the Neural Strategy is that it has a high success ratio in finding the dominant side of even-money wagers and keeping us on the dominant side most of time.

This game was ended when, on decision 46, we reached our target profit of \$100.

The Neural Strategy is a very successful betting and winning strategy for roulette. We have confined our testing and playing to the Nevada double zero game, which has the poorest odds for the player out of all the versions of roulette. If you have a chance to play the Atlantic City versions of the game or the international versions, *you should do at least as well and probably better.*

If you play roulette with the *en prison* rule, your wager will be frozen when a zero shows. The easiest way to handle the betting series is to ignore the zero. In other words, if your wager is for \$13 and a zero shows and the next spin loses, raise your wager one level in accordance with normal betting procedures even though you have wagered \$13 for two consecutive decisions.



BACCARAT

Description of the Game

Baccarat is a card game which was originally a European game invented in Italy. There are different versions of the game currently played in Europe such as *chemin de fer* and *baccarat en banque*. We are only interested in the American version of baccarat.

There are two varieties of baccarat offered in the United States, baccarat and mini-baccarat. The games are the same, the only difference being the size of the tables, number of casino employees used and the rituals followed in playing the game.

Regular baccarat is played at a large table seating up to twelve players with three dealers. To attract high rollers, the casinos have imbued this game with an aura of glamour. The dealers do not wear standard casino uniforms but are dressed in tuxedos. A bevy of beautiful and sharply dressed women sit around the table, smiling at customers and looking altogether winsome. These women are known as *shills* and are there to attract players.



The baccarat playing area is usually in a special roped off section of the casino, adding to its allure. This may have put off certain players who feel that the game is too sophisticated for them. But baccarat is really a very simple game.

The formal version of baccarat also has higher betting limits, with the usual wagering limits ranging from a \$20 minimum to a \$2,000 maximum.

Mini-baccarat is located on the main floor of the casino and is played at a table resembling a blackjack table, staffed by only one dealer. The minimum wagers at mini-baccarat are usually \$2 to \$5, and *therefore this version is better suited for the Neural Strategy*.

In baccarat, tens and face cards are valued as zero, Aces are counted as 1, and all other cards are counted at their face values. There are two or three cards in each baccarat hand, and the highest value of a hand is 9. To determine the value of a hand where the total value of the cards exceeds ten, you will subtract ten from the hand total. For example, a 7 and a 5 total 12, which is valued as a 2.

Here are some other examples of baccarat hands and their values:

Cards	Hand Value
2 and King	2
7 and 5	2
9 and Ace	0
7 and 8	5
6 and 5 and 8	9

The rules of the game are printed clearly and are available to all players at the table. It is not necessary for a player to learn these rules because the dealer acts in accordance with rules without consulting the players. All a player really needs to know is how to place a wager on either player or banker, which are the two wagers allowed.

The rules for playing player and banker hands are:

PLAYER RULES

When first two hands total:	Player:
1-2-3-4-5-10	Draws a card
6-7	Stands
8-9	Natural - Stands

BANKER RULES

When first 2 cards total:	Draws when Player's third card is:	Does not draw when Player third card is:
3	1-2-3-4-5-6-7-9-10	8
4	2-3-4-5-6-7	1-8-9-10
5	4-5-6-7	1-2-3-8-9-10
6	6-7	1-2-3-4-5-8-9-10
7	STANDS	
8-9	NATURAL - STANDS	

Hands dealt a total of 8 or 9 on the first hand are called naturals and are automatic winners if there is no hand equal to or higher than the hand. If the player hand's first two cards total 8 and the banker's total 7, player wins without any additional draws.

If both two-card hands total the same natural, it is a tie and there are no additional draws.

With other totals, the rules have to be consulted to determine whether a third card will be drawn. The player hand must always act first *which gives an advantage to the banker hand.*

When the player hand holds a 1-2-3-4-5-10 it will always draw a card, except when the banker hand is a natural, which causes an immediate loss for the player hand.

The banker hand will always draw to a low hand of 0-1-2 unless the player's hand is a natural. The rules in the chart show the other rules for banker's drawings.

An interesting situation occurs when the player draws to a low total versus a banker's total of 3, 4 or 5. The banker hand may have the player hand beaten without drawing, but if the rules call for it, the banker hand must draw. As an example, if the player's hand is 3-10-Ace, for a value of 4 and the banker's hand is 2-3 for a value of 5, *banker still must draw the third card, even though he has player beaten by standing pat.*

In either the baccarat or mini-baccarat version of the game, the dealer handles all of the rules of play, and it is not necessary for a player to learn these rules. There are a number of rituals followed in regular baccarat which are easy to learn should you decide to play this version of the game.

Because the player must act first and because the banker rules are more favorable to it, the banker hand has an advantage over the player hand. To compensate for this, the casino will charge a commission of 5% on all banker hand winnings.

Bank wins 50.68% of all bets and loses 49.32% of the time. The player hand wins 49.32 of its bets and loses 50.68 of its wagers. The house advantage over a bet on banker is 1.17%, after deducting the five percent commission. The house edge over player hands is 1.36%. The advantages are quite small, even less than the pass line and don't pass wagers disadvantage of 1.4% in craps.

In baccarat and mini-baccarat ties result in standoffs with neither hand losing. There is nothing in baccarat comparable to the zero and double zero of roulette, where all hands lose.

Commissions on banker bets are collected when all cards have been dealt from a shoe or when a player decides to leave a table. In the mini-baccarat game, with a \$2 or \$5 minimum wager, smaller chips are used so that commissions may be paid on winning banker bets. With a \$2 minimum wager, ten cent chips will be used (5% of \$2 is ten cents) and with a \$5 minimum, twenty-five cent chips are used.

Neural Strategy at Baccarat

The Neural Strategy won 82.9% of all baccarat sessions. Baccarat's win rate is slightly less than that of roulette and craps, but it is still very respectable, and you will want to try your hand at this game just to experience it.

Table 9 summarizes twenty sessions of baccarat played at \$5 minimum tables in Las Vegas. These games are not hand picked and are presented in exactly the order in which they occurred. A session bankroll of \$300 was used for all sessions.

TABLE 9. SUMMARY OF TWENTY BACCARAT SESSIONS

Session	Decisions	Won or Lost	Length (in minutes)
1	47	+100	47
2	57	+101	57
3	48	-246	48
4	51	+102	51
5	39	+100	39
6	41	+100	41
7	40	+101	40

Session	Decisions	Won or Lost	Length (in minutes)
8	53	+101	53
9	17	-297	17
10	49	+105	49
11	52	+101	52
12	38	-236	38
13	19	-286	19
14	62	+101	62
15	48	+104	48
16	62	+103	62
17	70	+105	70
18	55	+104	55
19	41	+103	41
20	57	+102	57
TOTAL	946	\$568	946
AVERAGE	47.30	\$28.40	47.30

Table 9 shows that the average length of a session was about 47 minutes and that we won an average of \$28.40 per session. The average win rate was about \$36 an hour.

We won 16 games and lost 4, for an average win rate of only 80%, less than our overall average win rate of 82.9%.

If we consider only the 16 winning sessions, we compute the average amount won for these sessions as \$102.06, just slightly over our target win of \$100.

Our average loss for the four losing games was \$266.25 per game. The amount spent playing these twenty games was just under sixteen hours. If we played baccarat for four hours a day, this would represent four days of play.

This series of sessions does not show baccarat in its best light as our average amount won per game was only a little over \$28, whereas our overall average for all baccarat sessions was \$47.16 per game. In other words, if this series had equaled our average, we would have won \$943, instead of only \$568. I mention this in case you compare these twenty games with the twenty games shown for roulette in Table 7 and decide that you never want to try the Neural Strategy at baccarat. The typical results for baccarat are much better than the series presented here, *but in a series of only twenty games you may be significantly above or below the averages.*

Because we did not attempt to handpick the games shown in Table 9, you have seen the games just as they happened, which is a more honest approach to presenting this information than selectively presenting games played.

Each of these games were played in a mechanical fashion without varying from the Neural Strategy. In each of the games where the Neural Strategy is used, it is very important that you not vary significantly from the strategy and certainly not start trying to guess the next bet. Use the strategy as it has been presented, and you will find that your wins will come in a satisfactory manner.

To assist you in learning exactly how to apply the Neural Strategy in baccarat, we have presented the results of a game played in Las Vegas in tabular form in Table 10.

The left hand column in the table shows the decision number, with each number representing a hand of baccarat. This game lasted for 50 minutes.

TABLE 10. ANALYSIS OF BACCARAT GAME

Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
1 p	-	-	300	-
2 p	-	-	300	-
3 b	p-5	L-5	295	-5
4 p	p-8	W-8	303	+3
5 t	p-5	-	303	+3
6 p	p-5	W-5	308	+8
7 p	p-5	W-5	313	+13
8 t	p-5	-	313	+13
9 p	p-5	W-5	318	+18
10 p	p-5	W-5	323	+23
11 b	p-5	L-5	318	+18
12 b	p-8	L-8	310	+10
13 p	p-13	W-13	323	+23
14 p	p-8	W-8	331	+31
15 b	p-5	L-5	326	+26
16 p	p-8	W-8	334	+34

	Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
17	p	p-5	W-5	339	+39
18	p	p-5	W-5	344	+44
19	b	p-5	L-5	339	+39
20	b	p-8	L-8	331	+31
21	b	p-13	L-13	318	+18
22	b	p-20	L-20	298	-2
23	p	p-35	W-35	333	+33
24	p	p-20	W-20	353	+53
25	p	p-8	W-8	361	+61
26	p	p-5	W-5	366	+66
27	b	p-5	L-5	361	+61
28	b	p-8	L-8	353	+53
29	t	p-13	-	353	+53
30	t	p-13	-	353	+53
31	b	p-13	L-13	340	+40
32	b	p-20	L-20	320	+20
33	p	p-35	W-35	355	+55
34	t	p-20	-	355	+55

	Outcome	Amount Bet	Win-Loss	Bankroll	Amount Won
35	p	p-20	W-20	375	+75
36	p	p-8	W-8	383	+83
37	b	p-5	L-5	378	+78
38	b	p-8	L-8	370	+70
39	p	p-13	W-13	383	+83
40	p	p-8	W-8	391	+91
41	b	p-5	L-5	386	+86
42	p	p-8	W-8	394	+94
43	p	p-5	W-5	399	+99
44	p	p-5	W-5	404	+104

The second column from the left shows the **Outcome** of each hand. The third column **Bet-Amount** shows how we wagered and the amount bet. For example, decision 13 shows that we wagered \$13 on player. The fourth column **Win-Loss** displays the results of each hand, with **W** indicating a win and **L** equaling a loss. The symbol **W-8** shows an \$8 win.

The fifth column **Bankroll** tracks our bankroll throughout the game. And the right hand column **Amount Won** tracks our cumulative winnings (or loss) after each hand.

We began the game by observing two hands. We made no wagers for decision 1 and 2, but instead observed a p p pattern. On decision 3 we began wagering for p to repeat. *We continued wagering on the player hand throughout this game as we never lost a Level 5 wager (\$35 in this case) and therefore did not switch sides.* This is not uncommon and happens about one-third of the time.

If we had lost a \$35 (Level 5) wager, we would have switched to betting banker and continued betting banker in accordance with the Neural Strategy rules. We would have used the same approach as was discussed for roulette on page 46 with respect to the switch to banker. We would have continued betting banker until we had won at least three banker hands and then lost a Level 5 banker wager or until we had played at least 5 banker hands and then lost a Level 5 wager.

There were five ties in this game (indicated by a "t" symbol), and of course, we neither won nor lost on these decisions.

Out of 44 hands, a total of 24 resulted in player wins. Excluding the 5 ties, player won 62% of the hands with a win or loss decision.

The Neural Strategy has a high success ratio in finding the dominant side of even-money wagers and keeping us on the dominant side most of the time.

We ended this game after decision 44 when our target win of \$100 was exceeded.

We encourage you to try baccarat using the Neural Strategy. You will find it a pleasurable and hopefully profitable experience.



CRAPS

Description of the Game

Craps is a game played with a pair of dice on a large table with a high board around its perimeter. The layout printed on the table shows the possible craps wagers. We are only interested in the **Pass Line** and the **Don't Pass** wagers with the Neural Strategy.

The game is conducted by four casino employees, consisting of three dealers (standing) and a boxman (seated). The boxman supervises the game. Many times you will see one or two other casino personnel standing behind the boxman. These are usually a floor person and perhaps a pit boss.

Craps bets are made with casino chips, and before entering a game, it is necessary to change your cash into chips. To buy into a table, place your cash on the table in front of one of the dealers at the ends of the table. The dealer will hand your cash to the boxman who will count it and drop it into a slot in front of him. The cash falls into a dropdown under the table, sometimes called the coffin. The dealer will place an equivalent

amount of chips in front of you on the table. You should promptly pick up the chips and place them directly in front of you in the rails built into the sideboards of the table. *Chips should not be left on the table unless they are a wager.*



The dice are handled by the players standing around the table. Dice rotate in a clockwise fashion from player to player, and the player who is throwing the dice is called the shooter. The shooter will continue to roll the dice as long as points are being made. If the shooter fails to make a point and sevens out, the next person will be given the opportunity to shoot. Shooting the dice is strictly optional, and any person who does not want to shoot may pass the opportunity.

Before the shooter has thrown the dice for the first time, no point has been established. It is at this time that wagers may be made on the pass line and don't pass wager. A roll when no point is established is called a *Come Out Roll*. After a point has been established, a dice roll is called a *Point Roll*. It is important to distinguish which type of roll is occurring as pass line and don't pass bets, also called *line bets*, are normally made only before a come out roll. Also these line bets win and lose differently on come out rolls and point rolls.

It is easy to determine the type of roll. A large disc (usually white) is positioned on each end of the table. If the disc nearest you is outside the area where the point numbers are printed on the table, it is a come out roll. If the disc is placed on a point

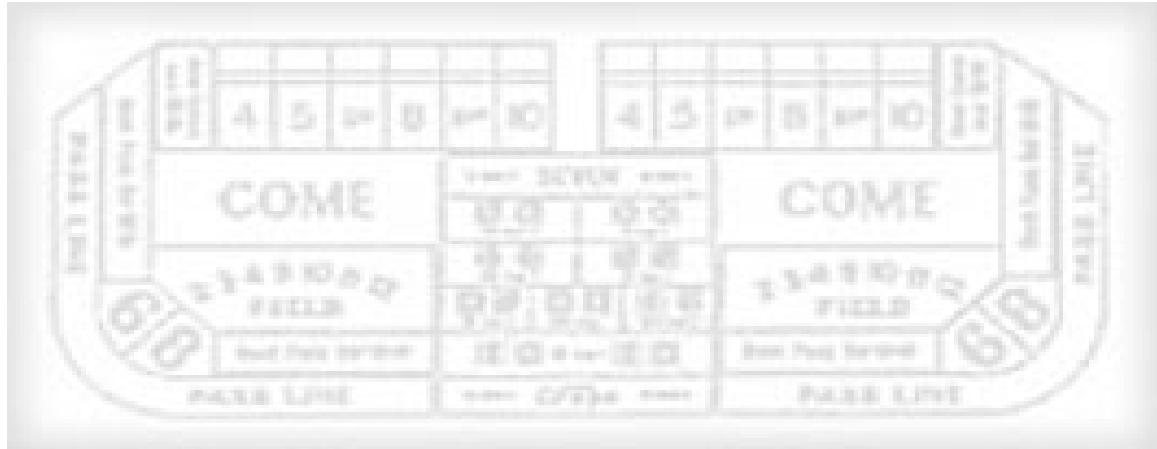
number box, it is a point roll. If, when you begin play at a craps table, and a point roll is in progress, you should wait until a point has been made or lost and it is a new come out roll before making a line bet.

A *pass line bet* is made by placing chips in the pass line area. The pass line betting location is the area surrounding the *betting layout* and closest to the player standing at the table. A pass line wager should be made before the dice are rolled on a *come out roll*.

If the outcome of the come out roll is a 7 or 11, the pass line wager wins *even-money*.

If the outcome is a 2, 3 or 12 (called *Craps*), the pass line bet loses.

In any of these cases, when a 7, 11, 2, 3 or 12 is rolled, no point has been established and the next roll is still a come out roll.



If the outcome of the roll is a *point number* of 4, 5, 6, 8, 9 or 10, then this number becomes *the point*. The white marker disc is moved to the box for the point number. The pass line wager is not affected by this roll. The dice will continue to be rolled until either a

7 is rolled or the point number is rolled. If the 7 is rolled first, the shooter is said to have *sevened out*, and the pass line wager loses. If the point number is rolled before a 7, the shooter has made his point, and the pass line wager wins even-money.

After the point has been made, or the shooter has sevened out, the process begins again with a new come out roll at which time new pass line wagers may be made.

The pass line wager has its greatest advantage on come out rolls. Out of the 36 possible combinations of a pair of dice, 7 and 11 can be rolled in eight ways, while a craps number of 2, 3 or 12 can only be rolled four ways. On come out rolls, a pass line wager would win, on the average, eight times out of 36 rolls, while only losing four times out of 36. On the come out roll, the pass line wager has an advantage over the house. However, once a point has been established, the house has an advantage over the pass line wager, as *a seven can be rolled six ways out of 36, which is more than any of the point numbers*. The house edge after come out rolls is so substantial that it cancels the player's advantage on come out rolls, and gives the house an overall edge over the pass line wager of 1.4%.

Incidentally, the casino will allow a player to make a pass line wager after a come out roll, when a point has already been established. You can see that this is a foolish wager, as *without the advantage of the come out roll, the pass line has very poor prospects of winning*.

A *don't pass bet* is made by placing chips in the don't pass area, directly behind the pass line betting area. *Don't pass wagers can only be made before a come out roll.*

If the outcome of a come out roll is a 7 or 11, *the don't pass wager loses*.

If the outcome of the come out roll is a 2 or 3, *the don't pass wager wins even-money*.

If a the outcome is a 12 (a 2 in Northern Nevada), the don't pass wager neither wins nor loses.

If the outcome is a point number of 4, 5, 6, 8, 9 or 10, then this number becomes the point and the marker disc is moved to the appropriate point box. The dice will continue to be rolled until either the point is made or the shooter sevens out. If the point is rolled first, the don't pass wager loses. If a 7 is rolled before the point number, the don't pass wager wins and is paid even-money.

On the come out roll, the don't pass wager is at its greatest disadvantage. The don't pass wager can lose if a 7 or 11 is rolled, but can win only if a 2 or 3 (3 or 12 in Northern Nevada) is rolled. It has eight ways to lose with a 7 or 11 and only 3 ways to win with a 2 or 3. However, after a point has been established, the advantage swings overwhelmingly in favor of the don't pass wager as a seven can be rolled more ways than any point number, and seven is the winning number for don't pass wagers after the come out roll. If the 12 was not barred by the house, the don't pass wager would have an advantage over the house. By barring the 12 (2 in Northern Nevada, which has the same effect), the house advantage over the don't pass wager becomes about 1.4%.



The minimum wagers on craps tables range from \$1 to \$25 and maximums range from \$500 to \$5,000. In downtown Las Vegas there are many \$1 and \$2 minimum tables. Tables with \$5 and higher minimums are more common on the Las Vegas strip and in Atlantic City. In Northern Nevada and Laughlin, \$1 and \$2 tables are plentiful.

Before beginning play on a table, it is a good idea to check the plaque next to the dealers at the end of the tables for maximum and minimum wagers accepted. Table limits change from one casino to the next and even change within the same casino. In fact, your favorite table's limits may go up in the higher demand times of evenings and weekends. It pays to check the limits before beginning play. If you do make a mistake and start to play at a \$25 minimum table, and you are a \$5 better, do not change your betting strategy to fit the table. Just leave. There are plenty of craps tables around to accommodate the size of your bankroll.

Neural Strategy at Craps

The Neural Strategy wins 84% of the craps sessions. As has been mentioned earlier, a special variation of the Neural Strategy is used for craps.

In testing the general strategy at craps, we could not achieve the winning rates that we reached with roulette and baccarat because craps is *choppier* than either of these games. By choppier we mean that it is less likely to establish a clear trend and continue with this trend for at least a limited number of decisions. Extensive testing of the craps game showed that trends of don't pass decisions are more common and more reliable than trends of pass line decisions. A number of techniques were used, but the easiest to use and the most consistent strategy was to bet only don't pass for the first five levels of wagers and then to switch to pass line with a Level 5 wager loss. We also found that when a string of decisions with don't pass dominating was broken, that is, pass line had become dominant, pass line wins were more likely to continue to dominate for at least a few more decisions.

For craps, the general strategy is modified as follows:

We will not observe any craps decisions to select a betting pattern. We will begin wagering don't pass and continue to bet only don't pass until we

lose a Level 5 wager (\$35 wager for a \$5 bettor). After losing the Level 5 wager we will immediately switch, without skipping any decisions, to wagering on the pass line. We will continue to wager pass line in accordance with the general rules for the Neural Strategy (rules are listed on pages 34-36).

With this change to the strategy rules, craps sessions can be beaten with an 84% win rate.

Table 11 summarizes twenty games played recently in downtown Las Vegas on \$2 and \$5 minimum tables. These games are presented in the order in which they occurred and have not been hand picked. The session bankroll used for all games was \$300.

Reviewing Table 11, we can see that the average length of a playing session was about 51 minutes with an average win of \$52.25. This works out to about a dollar a minute, playing with a \$300 bankroll.

We won seventeen games and lost three, for a session win rate of 85%, which is slightly higher than our average win rate of 84%.

If we look only at the 17 winning sessions, we find that the average amount won per winning game was \$110.18 which is slightly higher than our target of \$100 per session.

Our average loss was \$276 per losing game.

The total amount of playing time was slightly over seventeen hours. If we played craps for somewhat more than four hours a day, these sessions would represent four days of play.

All of these sessions were played using the modified rules for craps; that is, we started every session wagering only on the don't pass side and switched to pass line only if we had lost a Level 5 wager.

Game 9 was a particularly difficult one, as it took about two hours

TABLE 11. SUMMARY OF TWENTY CRAPS SESSIONS IN DOWNTOWN LAS VEGAS

Session	Decisions	Won or Lost	Length (in minutes)
1	60	+102	60
2	63	+106	63
3	45	+105	47
4	61	+100	61
5	59	-243	59
6	38	+102	38
7	19	-285	19
8	56	+96	56
9	120	+98	120
10	70	+115	70
11	35	+106	35
12	48	+108	48
13	47	+109	49

Session	Decisions	Won or Lost	Length (in minutes)
14	30	-300	30
15	46	+122	46
16	44	+112	44
17	42	+129	42
18	51	+149	51
19	48	+105	48
20	41	+109	41
TOTAL	1023	\$1,045	1023
AVERAGE	51.15	\$52.25	51.15

to complete for a \$98 win. This was one of those games where we could not find a stable pattern. In these cases, we feel that many times it is better to quit at some point prior to winning the target \$100, even though this is a deviation from the strategy. The Neural Strategy works well most of the time, but on those occasions where no pattern seems to become established, or at least not the one we are wagering, sometimes it is better to terminate a session than to continue to fight for every win.

On the other side of the coin, we seem to have gotten a little carried away with game 18. Our notes reflect that we had a continued winning streak on don't pass and decided to prolong the game, within certain parameters for prolonging winning games, which we will discuss shortly.

TABLE 12. ANALYSIS OF CRAPS GAME

	Outcome	Bet-Amount	Win-Loss	Bankroll	Amount Won
1	p	d-5	L-5	295	-5
2	p	d-8	L-8	287	-13
3	p	d-13	L-13	274	-26
4	d	d-20	W-20	294	-6
5	d	d-13	W-13	307	+7
6	p	d-5	L-5	302	+2
7	d	d-8	W-8	310	+10
8	p	d-5	L-5	305	+5
9	p	d-8	L-8	297	-3
10	p	d-13	L-13	284	-16
11	p	d-20	L-20	264	-36
12	d	d-35	W-35	299	-1
13	d	d-20	W-20	319	+19
14	d	d-8	W-8	327	+27
15	d	d-8*	W-8	335	+35
16	d	d-8*	W-8	343	+43
17	d	d-8*	W-8	351	+51
18	d	d-8*	W-8	359	+59
19	d	d-8*	W-8	367	+67

	Outcome	Bet-Amount	Win-Loss	Bankroll	Amount Won
20	p	d-13**	L-13	354	+54
21	d	d-8*	W-8	362	+62
22	p	d-5	L-5	357	+57
23	p	d-8	L-8	349	+49
24	d	d-13	W-13	362	+62
25	p	d-8	L-8	354	+54
26	p	d-13	L-13	341	+41
27	p	d-20	L-20	321	+21
28	p	d-35	L-35	286	-14
29	d	p-50	L-50	236	-64
30	p	p-75	W-75	311	+11
31	d	p-35	L-35	276	-24
32	d	p-50	L-50	226	-74
33	p	p-75	W-75	301	+1
34	p	p-35	W-35	336	+36
35	d	p-20	L-20	316	+16
36	p	p-35	W-35	351	+51
37	p	p-20	W-20	371	+71
38	p	p-13	W-13	384	+84
39	d	p-8	L-8	376	+76
40	d	d-13	W-13	389	+89

	Outcome	Bet-Amount	Win-Loss	Bankroll	Amount Won
41	p	d-8	L-8	381	+81
42	p	d-13	L-13	368	+68
43	d	d-20	W-20	388	+88
44	d	d-13	W-13	401	+101

Other than calling a difficult session over even if you have not reached the target win or prolonging a winning session using our specified parameters, there is no reason to depart from the modified craps playing strategy.

A detailed account of a craps game played in Las Vegas is shown in Table 12.

The left hand column shows the decision number, with each number representing *one decision entailing a win or loss of a line bet*. The second column **Outcome** shows the results of each craps decision. A d means that a don't pass wager would have won, a p indicates that a pass line wager would have been a winner.

The third column **Bet-Amt** shows how we wagered and the amount wager. For example, on decision 4 we bet \$20 on don't pass. The fourth column **Win-Loss** shows the effect of each outcome on our wager. For decision 4, we won our \$20 wager (W-20).

The second to right column **Bankroll** tracks our bankroll throughout the session. And the right hand column shows our cumulative win or loss after each decision.

We did not observe any decisions before starting to wager and we immediately began betting don't pass. By decision 15, we noticed that we were enjoying a string (three at this point) of uninterrupted don't pass decisions. We altered our betting pattern at this

point and began wagering \$8 instead of the lowest \$5 wager normally called for. We continued wagering \$8 instead of \$5 through decision 19. For decision 20, we decided to raise our bet one more level and bet \$13 instead of \$8. Of course, the Neural Strategy would have called for only a \$5 wager at this point. We lost decision 20 and *promptly reverted back to the normal strategy for decision 21*. Since we would have been wagering (and consequently lost) only \$5 on decision 20, for decision 21 we assumed that we had only lost \$5 on decision 20, so that our next wager of \$8 was the normal wager called for by the Neural Betting Pattern.

This pattern of raising our wager during a string of favorable decisions is called bet acceleration and can be used at baccarat, roulette and craps.



To accelerate wagers use the following rules:

1. Only raise the wager one level from the lowest wager at first. For a \$5 bettor this would be an increase from \$5 to \$8.
2. Only raise the wager after you have won two or more consecutive wagers with no losses, and *have just won the lowest level wager*. As an example, if you won a \$8 wager and a \$5 wager in two decisions, you could accelerate the next wager to \$8, instead of \$5.
3. If an accelerated wager has a loss, ignore the actual amount wagered and proceed as if the loss was of a Level 1 wager. If you lose an \$8 accelerated wager, the following wager will also be for \$8 as an \$8 wager follows a loss of a \$5 wager.
4. If, after accelerating your wager one level, you have won three or more wagers with no losses, you may accelerate one more level. This is what we did on decision 20 in the game shown in Table 12. Notice that we lost this wager, and that the following wager made for decision 21 was for \$8, *the same amount we would wager after losing a \$5 wager*. Any time that you accelerate two levels, in the event of a loss, you must ignore the actual amount wagered and pretend that the lost wager was a Level 1 wager.

This bet acceleration technique can be quite effective and is used primarily for extending a game where we have already won our target profit, or close to it, and we are interested in riding out a winning streak to generate even more profits. More about this later.

After winning decision 21, we did not accelerate our wagers anymore during this game. By decision 28, don't pass had worn out its welcome, and having lost our Level 5 wager of \$35, we switched to betting pass line. We continued betting pass line through decision 39.

After switching to betting pass line on decision 29, we continued to wager pass line as long as our wagers were high (above \$35) and as long as we continued to win. By decision 36 we hit a streak of three pass line wins. We continued to reduce our wagers while still wagering pass line until decision 39 when we lost an \$8 pass line wager. For the next decision we immediately switched back to don't pass. *With craps, after switching to the pass line, you should continue wagering pass until suffering a loss on a wager below \$35. With a loss below a Level 5 wager, you will switch back to don't pass.*



WINNING AT GAMBLING

Why gamble? The purpose of this book is not to encourage people to gamble. Yet the odds are that you have gambled and will continue to gamble. Nearly everyone gambles.

I believe that people gamble because gambling is nothing more than an extension of the risks that living itself entails. Gambling compresses these risks into a short-term microcosm of the general human experience.

On a simplistic level, living itself is a gamble. People like to gamble because gambling represents, on a more controlled basis, the general risks of being a human being. I have talked to many gamblers over the years, and it is very common to hear people describe their emotions while gambling as *exciting*, or as a *pressure relief*. Some will even say that they gamble to win.

What is obvious is that gambling fulfills some basic human need that is more comprehensive than the need to win. It is an urge that defies logic even though many persons will try to attach logical reasoning to why they gamble.

It is beyond the purpose of this book to discuss the psychological and emotional aspects of gambling. However, we will try to direct the purpose of gambling. Our focus is to pursue gambling strictly as a means of winning money using the techniques described in this book.

I have experienced both types of gambling, gambling for the hell of it (although I wouldn't have called it that at the time) and directed, purposeful gambling with the object of winning.

Trust me on this: winning is more fun than losing. Winning requires a much more controlled, directed approach than losing. It is easier to lose than it is to win. But the satisfaction of winning (not to mention the extra cash in your pocket) more than offsets the discipline required to become a winner.

Statistically, I can tell you that you are most likely a loser at gambling. You may be the most conservative banker or accountant who would drive across town to save ten bucks on a purchase, yet drop two hundred bucks in an hour in a casino. *On the average, over ninety percent of casino gamblers are losers.*

This chapter is the most important one in this book. In it we will cover the essential aspects to becoming and remaining a winner at casino gambling.

To win at gambling requires *knowledge* of the game and the system to be used while playing, the ability to correctly *manage your money*, the *self control* to handle the pressure generated by the casino atmosphere, recognition of the importance of *trends* in gambling and the *discipline to keep careful records* of gambling wins and losses.

Knowledge

If you are going to gamble, you had better know what you are doing. You can't expect to win if you don't know how to play the game.

Craps has been a favorite game of high rollers for a long time. The typical high roller will bet the pass line, take odds and cover the numbers with place bets. This is a system which can win large amounts if the dice are passing. If the dice are not passing with greater than normal regularity, this method of play can be a disaster and it usually is.

In a craps game I was involved in at the Desert Inn on the Las Vegas strip a few years ago, a celebrity joined us at the table (I won't embarrass him by naming him). This guy cashed in for \$10,000 and proceeded to lose it in ten minutes. He obviously had played the game before, as he knew exactly how to make \$500 pass line wagers with full odds and how to cover all of the place numbers with \$500 or \$600 wagers. He even knew how to throw \$100 chips to the stickman and take all of the hardways. What he didn't know was how to properly play the game of craps – with a reasonable prospect of winning.

His "system" would only work if the dice cooperated and produced long strings of numbers between sevens. On this particular table at this particular time this was not happening, and he didn't have a prayer of winning.

Did this celeb player have the knowledge to beat the game? Obviously not. His approach was a common one used by high rollers *who nearly always end up losers*. While his wagering might have impressed a novice, he had less chance of winning than any beginner sticking with one or two basic wagers.

I recall one craps game at the Las Vegas Hilton where I was approached by two little elderly women. They were slot machine players who thought that craps looked "interesting" and decided to risk twenty bucks to experiment with the game. They started

asking me for advice and not wishing to see them lose all of their slots winnings, I advised them on how to wager. They made one wager at a time on the pass line, with no odds taken. If the shooter made a pass, I let them raise their \$5 base wager by \$2. If the shooter sevened out, they were back to the \$5 wager.



After about twenty minutes they had doubled their \$20 to the princely sum of \$40 and they asked me what to do. I told them that they had a nice win for the time invested and that it was time to quit. They thanked me for my help, and before I could object, left a \$2 tip in my chip rack.

As they tottered off, and I turned my attention back to the table and to some of the snickers of the high rollers at the table, the thought occurred to me of how superior the ladies' play had been to my fellow players wagering with \$25 and \$100 chips. With their limited knowledge of the game (and my assistance) they had the good sense to quit winners. Most of the high rollers at the table would continue to play and sign additional markers until the game had totally wiped them out.

It continues to amaze me how otherwise intelligent people seem to leave most of their judgement behind when it comes to gambling. They expect to beat a game that they don't even understand, and they have the nerve to become angry when they are clobbered by the casino.

Many stock market investors are just like the casino gamblers. They want to make money by buying and selling stocks with zero investment in learning the game. A typical stock investor hears about a "hot stock" from his broker, his drinking buddy or even his barber. Without knowing anything more than the name of the stock, he buys a hundred or

so shares. And six months or a year later he sells the stock at a substantial loss. Amazingly, he will probably buy another stock relying on another hot tip and repeat the process all over. He just can't seem to figure out that if he wants to play this game and win, he needs to have some knowledge of how the game is played.

You can't hope to win something you don't understand. The rules for using *The Neural Strategy* are straight forward, but it will take an investment of time to learn how to use them. There is no substitute for practice in learning to apply these rules. If you read this book quickly, skimming or skipping certain chapters, and then rush off to Las Vegas or Atlantic City, don't blame me if you end up losing.

An essential element of practice is to not only learn how to use this strategy, but to gain a level of confidence that the strategy works. I have this confidence because I have used the strategy. I know what it feels like to occasionally lose a game, and I have a feel for how each game usually goes. I have tried to share these things with you, *but there is no substitute for experiencing it yourself*. In other words, don't take my word or anybody else's for it. Practice the strategy at home until you can use it flawlessly and until you have confidence in both the strategy and yourself.

Managing Your Money

Most people approach casino gambling as a lark, and little consideration is given to the amount of money needed for the endeavor. Some attention may be given to finding a system or gimmick to gain some edge over the casino, and off the player rushes to try his hand at winning.

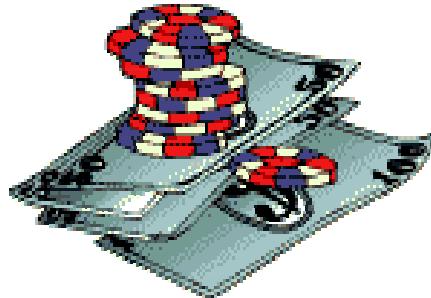
While the use of a successful system or strategy is critical to winning consistently, without planning and controlling the money risked, most systems are doomed to failure.

The number one rule for gambling is *never to play with money you can't afford to lose*. No matter how skillful a player you are, or how lucky you feel, if you gamble with money you can't afford to lose, you are asking for trouble.

The amount of money you have for gambling determines the size of bettor you will be. *The Neural Strategy* works by chipping away at the casino's cash, and you must have enough cash to allow this strategy of "chipping away" to work.

As a general rule of thumb, the amount of money you take for a gambling excursion (called your **Trip Bankroll**) should be five times the amount of money required for a session at the table (called your **Session Bankroll**).

One way to calculate the amounts of these bankrolls is to start with the bet size you feel comfortable with. If you are comfortable with a \$5 wager as your minimum wager, then using the Neural Strategy, you will need \$300 to play a game.



This amount will become your Session Bankroll, which is the amount you will take for a game or session. The amount needed for a trip will be five times the Session Bankroll, or in the case of a \$5 bettor, \$1,500 ($5 \times \$300$).

If you are a \$2 bettor, your trip bankroll will be \$600. A \$25 bettor will need a \$7,500 trip bankroll, and a \$100 bettor will require \$30,000 for a gambling trip.

These amounts are not arbitrary; I did not dream them up. These are the minimum amounts needed to correctly play the Neural Strategy. If you take less, you will be playing over your head and will not have enough money to play the strategy correctly. And if you don't play correctly, your chances of winning are severely diminished.

Whenever you play a session, you will have a **Loss Limit** equal to your Session Bankroll. If you lose the Session Bankroll, that session is over, finished. You will never continue to play after losing a session. Take a break. Take a walk. Take a nap. But never continue playing.

Likewise, winning a session (one third of the session bankroll, as called for in the Neural Strategy) constitutes reaching your **Target Profit** for that session. You should take a break after winning a session. However, you may wish to continue wagering, even after achieving the target profit, on a controlled basis by accelerating your wagers so long as you continue to win. Whenever your accelerated wagers lose, your session will be over.

You will notice that this approach is very controlled. You will use a set amount of money, limit your losses, and aim for target wins. This discipline will help you in developing the overall confidence to emerge a winner in your contest with the casino.

Self Control

A former business associate of mine was the worst gambler I have ever seen. His track record was perfect: He never left Las Vegas a winner.



If he was winning he always increased his wagers to really clean up on his lucky streak. If he was losing he was forced to increase his wagers to win back his loses. In short, he always continued to increase his wagers until all of his money was gone

He had no self control when he was gambling. **There is nothing more important than exercising self control when gambling. If you can't do this, then you are doomed to remain a loser.**

If you really want to lose, here is a set of rules guaranteed to fulfil this wish:

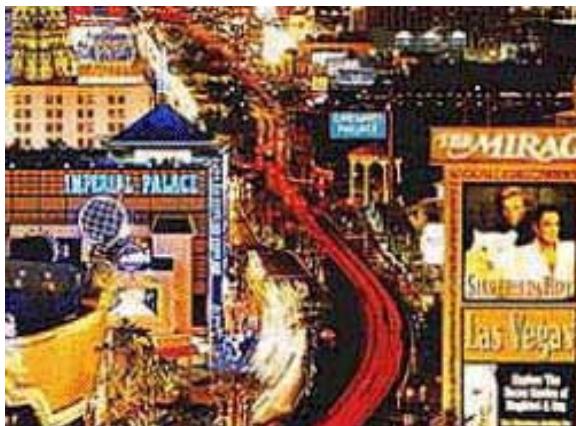
- Always take small profits and accept large losses when they occur.
- Increase the size of your wagers whenever you feel the time is right.
- If you lose a session or two, just pull out more money and keep playing.
Your luck might change.
- Drink as much as you want while gambling after all, the drinks are on the house.
- Never listen to those nagging doubts that tell you it is time to quit.
- If you lose, blame the dealers, your rotten luck, the cocktail waitress, anyone but yourself.

The cornerstone to winning is patience. With *The Neural Strategy* you will not win the keys to the casino in one session. The whole approach to the strategy is to gain a small advantage over the casino and to continue to whittle away at it. For this strategy to work, you must be patient and control your impulses so that the strategy has a chance to work.

When you enter a casino, the enemy is not the casino or the dealer; it is you. If you can control yourself, you will become a winner. If you can't, then it is unlikely that any strategy will make you a winner.

Trends

In casino games, the trend is your friend. No matter how improbable a trend may be, it usually makes sense to follow the trend rather than buck it.



This logic applies equally as well to futures and stock markets as it does to casino games. A few years ago, I decided that the price of silver was too low (it was about \$6.00 on ounce) and that the price was bound to go up

. I had considerable justification for making this decision, in that I had studied the supply and demand for silver, I had reviewed historical prices of silver, I knew that silver prices had been much higher just a short time earlier. I had, I thought, a very good case for silver prices to rise. So I purchased several silver futures contracts to take advantage of silver's temporary slump in price.

And silver prices continued to drop. By the time they were down to \$5.75 an ounce, I had had enough and I threw in the towel and sold at a loss. (As I write this, silver has recently been trading in the \$3.50 to \$3.60 an ounce range.) In my eagerness to take advantage of silver's "temporary price slump" I had forgotten one thing. Don't fight the trend. The trend in silver prices at that time was clearly down. And no matter how

illogical it seemed, they continued downward. Silver prices did not care that my analysis showed that they were due to turn up; they continued on their merry way in a **downward trend**. The moral of this story is simple: Don't fight the trend, no matter what you may think of its direction.

The Neural Strategy is designed to follow trends. When one trend peters out, it is ready to try another direction. If that direction fails, it is perfectly willing to reverse and try the original trend once more. Because it is mechanical it will zig when you sometimes think it should zag. Don't try to out think it. If has been proven to work and has a tremendous advantage over you trying to guess trends. It relieves the pressure we all feel when we are trying to figure out how to play a game. Follow the trend that the strategy will lead you on. You will lose a game occasionally, but your average will be much superior to other trend following techniques or to trying to outguess the game.

Record Keeping

Keeping a record of each game is essential. A sample record keeping sheet is shown on the next page. Don't carry around a notebook for this. It's a tipoff that you are more than a casual player and you may be hassled by the casino personnel. I usually use a sheet of paper or even the back of a deposit slip which I keep in my pocket. Later, after leaving the casino, I will transfer this information to my permanent notebook.

It is important to record the results of each session immediately after the session; otherwise you will forget. Recording this information promptly and accurately is an important part of managing your money. I also find that recording helps keep me focused on my purpose in gambling. I may be enjoying myself immensely, but my primary purpose is to make money. Recording each session and the cumulative results helps keep this goal in mind.



Date	Casino	Session Bankroll	Won (Loss)	Cumulative Won (Loss)



PLAYING TO WIN

Before you begin to put the techniques of *The Neural Strategy* to work, you must have confidence and believe that you are going to win. By confidence, I don't mean a blind faith in luck, for that's how most losers approach the gaming tables. Confidence is the feeling that you have it all together. You understand the games well enough to play correctly, your betting and playing strategy is down pat, you have brought the correct bankroll with you, you are prepared to record each of your sessions, and you are in control of your emotions.

Most gamblers don't want to spend much time, if any, in learning how to become a winner. They believe that there is some magic formula out there, which if mastered, will turn them into perpetual winners, with almost no effort on their parts. Unfortunately, winning at gambling, like attaining success in almost any endeavor, requires some time and commitment.

I can't make you a winning gambler. *The Neural Strategy* is a highly effective technique for winning. But it won't work for you unless you put the time and commitment into its application.

You can become a consistent winner if you will:

1. Learn the strategy so thoroughly that you can apply it without any hesitation.

The first step in learning it is to pick a game, say baccarat. If you have a deck of cards you can play baccarat in your home. Write down the Neural Strategy rules for baccarat on a sheet of paper and start dealing some baccarat hands. As you play each hand, write down your bet selection and amount wagered, such as p-5, indicating a \$5 wager on player. As you progress, you will find that you can track your wagers without using a pencil and paper.

2. Continue to practice at home with as many distractions as you can find. Play in front of the television. Play when other people are in the room talking to you. Play as often as you can, for about thirty minutes at a time. By learning to play for short periods with many distractions, you will be acclimating yourself to the casino environment. Before trying out the strategy in a casino, you will want to know it so well that you can apply it without thinking about it. When you have reached this stage, with one of the games, you can start the process over with a different game. Learning a second or third game is purely optional. I like to move from one game to another as it provides more variety and is more stimulating. But you may prefer to play only one game. It's your choice.

3. Plan your bankroll before scheduling a trip. Your bankroll should come from money that is extra and will not be needed for living expenses. If you take the rent money for gambling, the psychological pressure will probably be too much for you, and besides, this is just not good policy.

4. Get your record keeping system ready for the trip. A small notebook is all you need.

5. Set up a daily playing schedule for your trip. You don't have to have every minute scheduled, but I have found that my mental attitude is improved if I have set aside a definite time for gambling as well as times for other activities. This approach will also help you treat the gaming like a small business, i.e., there is a time for business and a time for pleasure.

6. Follow our guidelines for quitting a session. They are very simple. Anytime you lose a session, take a break. If you win a session, you should consider taking a break. If you don't take a break after a winning session, set aside all of your winning chips and start over as if it is a brand new session.

7. To increase the winnings per session, the **Acceleration Technique** described on pages 64 – 66 may be used. If you are extending a session beyond the target win of one-third of your session bankroll using the Acceleration Technique, be sure to quit if you lose your accelerated wager and the next two wagers called for in the normal betting series. The last thing you ever want to do is to turn a winning session into a loser because of greed.

8. Keep your wagering limits within your bankroll size. In other words, *don't overbet your bankroll*. It is often very tempting after several consecutive winning sessions to decide to increase the size of your wagers. If you have been a \$2 bettor, you decide to jump to the \$5 betting series. Don't do this unless you have a large enough bankroll to support the size of wagers. As a \$2 bettor, you brought a \$600 trip bankroll, divided into five \$120 session bankrolls. You won't be ready to increase your betting series to the \$5 level until your bankroll has grown to \$1,500, the level necessary for \$5 bettors. As your winnings increase, you will find that your bankroll has increased enough to do this. Just be patient.

TABLE 13. SESSION AND TRIP BANKROLLS

Bet Size	Session Bankroll	Trip Bankroll
\$2	\$120	\$600
\$5	300	1,500
\$10	600	3,000
\$25	1,500	7,500

Come to the table confident about yourself and your game. Play to win, not for any other reason, and certainly not just for the thrills of the casino.

Follow these principles. And you will be a winner.



