FREEROLL
POKER STRATEGY YOU CAN USE

ThreeBarrelBluff.com Issue 5

Aggression and the Turn

Let's think about holding A♠6♠ on the 9♠7♦3♣Q♠ board. This is an ideal time to continue our flop aggression. Why? The turn card is ideal for us in many ways. First, it gives us extra pot equity—we now have twelve outs as opposed to three (as with A6o). Secondly, the Queen is an uncoordinated overcard to the board, giving us extra fold equity—the opponent is going to be more wary about continuing with a hand like 88. This combination of pot equity and fold equity is mandatory for us to stay aggressive on the turn.

Here's a little equation to (over)simplify things a little:

POT EQUITY
+FOLD EQUITY
=AGGREASSION*

Sometimes we'll have so much pot equity that we won't need much fold equity. Let's say, for example, that we have Q♥J♥ on a T♥9♥2♣4♦ board. We draw out so often on the river that we only need our opponent to fold a very low percentage of the time for a 2nd barrel to be profitable. On the other hand, let's give ourselves 22 on an 843Ar board. Sometimes, the Ace on the turn gives us so much fold equity that our lack of pot equity (2 outs) is compensated by the fact that the opponent folds an extremely high percentage of the time. Most spots, though, aren't as cut and dried. What if we have A♠5♠ on a 9♠7♦3♣T♠board? Our pot equity is good, but the turn card actually decreases our fold equity, as it hits a lot of the opponent's range. Even a hand like 88 is unlikely to fold to a turn bet because it picks up a straight draw. It's the job of the poker player to weigh his own pot equity and fold equity to make these decisions in close spots. Once we've ascertained that we have a sufficient combination of pot equity and fold equity, we can continue our aggression. Usually this just means that we continue betting, as that would usually be our plan if we actually had a strong hand instead of our draw. However, in some situations it is better to go for a check-raise on the turn. What sorts of factors favor a check-raise over a second barrel? It's unlikely our opponent holds a strong hand. For example, say we hold A♣5♣. If we bet a wet flop—let's say 8♣7♣4♥—and our opponent calls, we can usually be certain he doesn't have a really powerful hand (like 88, 77, 44, 65, or 87) as he would usually raise these hands. Most of his range for calling probably includes hands like T9, J9, and A5 for straight draws; hands like 86, 76, and 55 for pairs and gutshot straight draws**; hands like A8 or 97 for weak pairs; hands like Q♣J♣ or K♣T♣ for flush draws, and hands like AJ or KQ that called simply with the intention of taking the pot away on the turn. To categorize these hands respectively, our opponent holds straight draws, pair+draws, weak pairs, flush draws, and air. Each of these hands are "floating" the flop, with the last category being considered more "pure floats" as they lack any pair or strong draw.

It's likely that our opponent will bet a wide, weak range on the turn. The turn card comes a 2♦, making the board 8♣7♣4♥2♦. Let's consider our opponent's likely action with his range after we check the turn. With his straight draws, flush draws, and air, he's going to bet the vast majority of the time—simply because betting is the most likely way he's going to win the pot. He's likely to check his weak pairs and pair+draw hands behind, as he'll probably want to get to showdown with his weak pair.

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Therefore, when he bets the turn, the vast majority of his range is very weak, and now the pot is very large. So, this becomes a good time for us to check-raise the turn as a semibluff, and of course, for Reason #3, capitalization of dead money. Sometimes, our opponent will be tricky on the flop with a hand like 65 and just call the flop. Other times, the turn card will help our opponent in a disguised way. Sometimes our opponent will hold a hand like TT, 99, A8, or 86 and decide to bet the turn and get the money in if we check-raise. To compensate for these possibilities, we need to make sure we have some equity before making this move. Thus, A♣5♣ on a 8♣7♣4♥2♥ board is perfect, as we have a ton of equity. A♣J♣ would be fine as well. K♦Q♥ probably wouldn't be as good of an idea. Board texture is critical in understanding when to bet out and when to check-raise. If our opponent flat calls a wet board, his range generally doesn't include monster hands like sets, two pairs, and straights. However, if our opponent calls on a dry board (let's say 8♣6♥4♥) check-raising the turn gets significantly worse. With fewer draws available, a large portion of his turn-betting range now includes slow-played sets, two-pairs, and straights.

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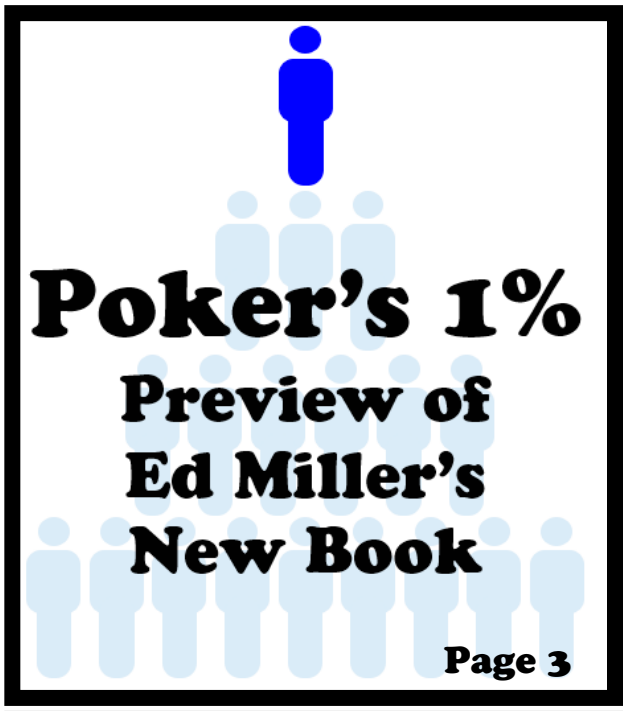

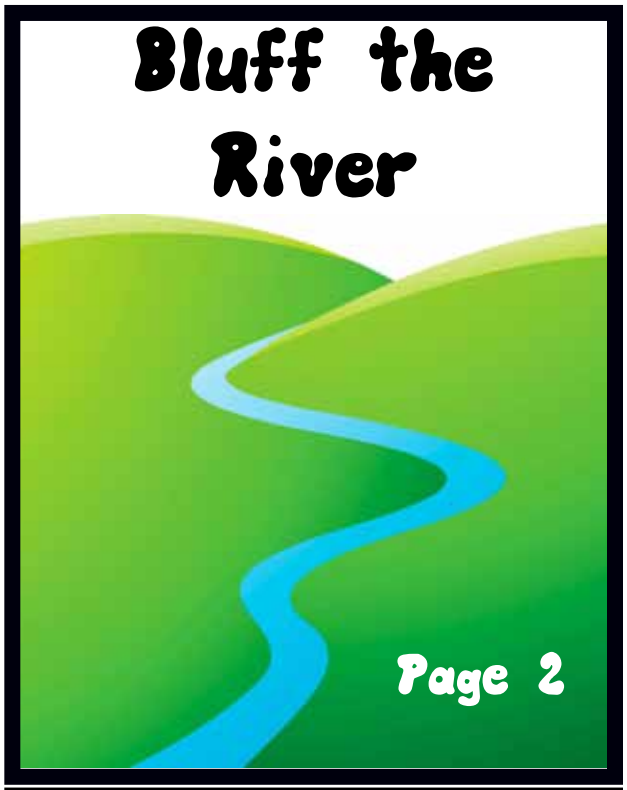

Bluffing the River with Multiple Players

I was recently discussing a hand with some players and I felt it needed to be shared. This was a spot where hero was bluffing the river with multiple players involved. Multiway pots can be confused as-is, but things get even more complicated when the stack sizes are varied. But rather than bore you with the preliminary information, let's get to the hand:

$2/$5 Live Poker
Jack (MP): $730
Hero (BUT): $1,030
WT (BB): $2,000
Hero: Q♦ J♦

Four folds, Jack calls $5, 2 folds, Hero raises to $30, 1 fold, WT calls, Jack calls

Jack is a bad loose player. He's been limping a ton preflop and playing pretty badly postflop. Our isolation here is 100% standard, both in terms of our hand and size.

The big blind is a weak tight (WT) player. He ran like God when he first sat down running his $500 up to $2k. Since that spurt of hands he's been playing very nitty both preflop and postflop. His preflop call is a little unusual for him, but it hints at a pretty narrow range of hands.

Flop ($92): T♠ 9♥ 7♣

WT checks, Jack checks, Hero bets $75, WT raises to $175, Jack calls $175, Hero calls

Hero catches a nice flop for his hand with overs and a two-way straight draw. Hero will pick up the pot a decent amount on the flop and when he doesn't he has a lot of equity with two cards to come and position. However, Hero faces a check/raise in this situation and a cold call which is unexpected.

Luckily for us the WT player sizes his check/raise poorly and we pick up the extra player along the way. This gives us an even better price to call and an extra source of implied odds. I'm not loving the fact that our improvement cards aren't the greatest in the world (the Eight fills up the 4-straight on board)…but I'm not folding either. I'd assume the WT player has a big hand (by his standards), likely two pair or a set, and just has no idea how to size correctly postflop. Also remember that WT players tend to think of bet sizes in absolute dollars, so if $175 seems like a lot of money to him in real-life he may think his check/raise is large (even though it's small relative to the pot).

Turn ($617): T♠ 9♥ 7♣ 3♦

WT bets $200, Jack calls $200, Hero calls $200

Again the WT player makes an horribly sized bet. Once Jack calls we are getting almost 5:1 on our money and can easily call with just a draw. Really not much to talk about here as this is strictly a pot odds decision and luckily for Hero, he got 'em.

River ($1,217): T♠ 9♥ 7♣ 3♦ 3♣

WT checks, Jack checks, Hero ???

The river pairs the board and now things get interesting. Both players check to Hero on the river and Hero needs to decide if he wants to check behind or go all-in as a bluff the river. On the river the stack sizes are:

- WT: $1,595
- Jack: $325
- Hero: $625

In the actual hand Hero did decide to shove the river. When describing the hand he kind of glossed over the river situation and said he thought they'd fold enough to make the shove +EV. I wasn't convinced so I had to pull out the math and get to work to proof it. So here is the math:

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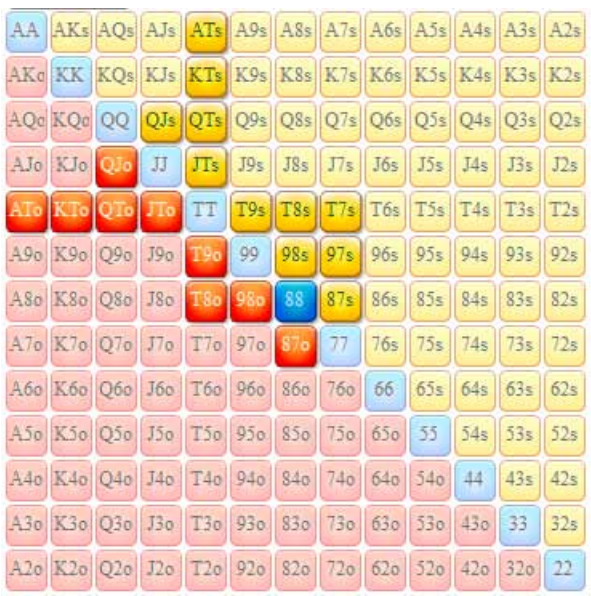
First we need to assign some ranges. I personally think that the WT player has one of two hands: T9s or 97s. I think if he had TT, 99, or 77 he would have shoved the river. A WT player isn't going to check the river to try and induce after he's taken this line. Which means his check is likely a two pair that hates life when the bottom card pairs the board.

Now because he's a tight player I think he will call T9, being unable to fold getting ~3:1 on a call. But I think he will fold 97s thinking his two pair got negated by one of us. A WT player isn't going to be a good hand reader so I don't worry too much about what I rep against him. I just care that he will fold enough since his decisions are based more around his own hole cards and comfortability. So I assume* if I shove he calls 50% of the time and folds 50% of the time. Easy enough.

Jack's range is really up in the air. Because he's a bad player he can easily show up with a wide range of hands. When he gets to the river I assume his range looks something like this:



I think he would have gotten active somewhere with the made straight or sets. Either by re-raising the flop, raising the turn, or shoving the river once WT checks. So the assigned range seems reasonable for a player of his caliber (both preflop and postflop). But we also need to make an assumption on the range he would call our river shove with. I'm going to make an assumption* that he will call with any pair of Tens or better and fold the rest. It may not be perfect, but it's a starting point. Taking our hole cards into account he has top pair+ 61% of the time…

Now we can just factor things into an EV formula and solve. I find it easiest to start by drawing

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Ed Miller's Poker's 1%

The one big idea so far (the idea that guides elite players) is that poker is a game about frequencies. What matters is not if you can play pocket jacks well or if you can figure out where you're at in hands. What matters is that you consistently, at nearly every betting decision, present your opponent with the correct frequencies of checking and betting, or folding, calling and raising. If your frequencies are close to correct, then when your opponents play with incorrect frequencies they will effectively beat themselves against your proper actions.

This is a revolution in thinking from traditional poker wisdom. First of all, to implement these ideas, no hand reading whatsoever is required—at least no hand reading in the heat of the battle. If your frequency-based thinking is advanced enough, you can go back to a "zero level" thinking where you just play your hand and ignore what your opponent may have.

Of course, very sophisticated consideration of what opponents might have has gone into the creation of the frequency-based strategy in the first place. But once the strategy is set, it's set-it-and-forget it. You can play it and basically not even consider what your opponents are doing.

If this idea rubs you the wrong way, think about it in these two ways. First, all I'm saying is that you could program a computer to play no-limit hold'em without building in an explicit hand-reading model. You could just give it a set of immutable frequency-based instructions, let it loose against the best players in the world, and it would do just fine. In fact, as of this writing, a group of artificial intelligence researchers has claimed to have done exactly this.

Second, have you heard about online players who play twenty-plus tables simultaneously and win at a high rate? If you haven't, these players exist.

The only way they could possibly exist is if they relied far more on this frequency-based approach than on making constant reads. No human brain could possibly make and keep accurate reads on 20, 30, or even more games at once. At least not while simultaneously playing at a high level. What these players have done is train their brains to behave much like a computer program.

This fact is also why I've always thought people generally overrate the advantage that a heads-up display (HUD) offers an online professional player. If you play the game at a truly high level, the information a HUD provides becomes less and less important. Many top, top players that I know—while they do often go through the motions of setting up a HUD while they play—concede that they don't use the thing for most decisions.

"So," you may ask, "if hand reading is useless, Ed, why did you write a whole book about it?" It's not useless. Not at all. It's very difficult for a human to play this immutable, frequency-based strategy I said you could load onto a computer. Hand reading—and making reads in general—is a shortcut we humans use to try to get to the correct answer without actually knowing the perfect solution. If we concede that we will never play a perfect strategy, we can fill in the gaps by making intelligent reads.

The bottom line is, however, that everything else you know about poker is secondary to the big idea in this book. The most important thing you can do is to make sure your frequencies are correct in as many situations as possible. Do that, and you will be nearly impossible to beat. Your opponents will beat themselves against you with their flawed play.

And now for a practical question. I hope I've convinced you by now that a frequency-based approach is very powerful. But how do you learn this frequency-based approach?

The best way I know is to explore it one situation at a time. You play for a while and record as many significant hands as you can. Then you go through each hand and determine your frequencies at every decision point by writing out hand ranges. If your frequencies look flawed, you find a solution and build ranges that conform to the correct frequencies. Then you do it for the next hand. And the next one. You do it over and over again until you build an intuition for it.

Let's try it out here with a simple situation so you see what I mean.

It's a $2-$5 game with $500 stacks. A player has opened for $15 from three off the button. You're on the button, and you call with KdJd. The blinds fold. There's $37 in the pot with $485 behind.

The flop comes Td7s2c. Your opponent bets $30, and you call. There's $97 in the pot with $455 behind.

The turn is the As. Your opponent bets $65, and you fold.

Did you play the hand well? It's hard to say. One could argue for folding, since you have a weak draw. One could argue for calling, since you have a draw to the nuts with money behind. One could argue for raising, since bluffing is always on the table.

Let's develop a frequency-based strategy for all the hands you can have and see what we might do with KdJd at each point in the hand.

Preflop, you call the raise. This is certainly not a call you'd make 70 percent of the time. Since you are one of five players the opponent raised into, you five share the responsibility to call roughly 70 percent of the time. Realistically, to call a raise from a player three off the button, you need a fairly good hand to be on a level playing field.

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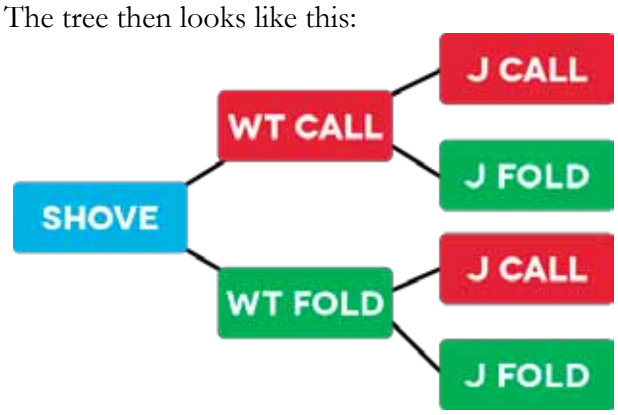
Bluffing the River continued from page 2

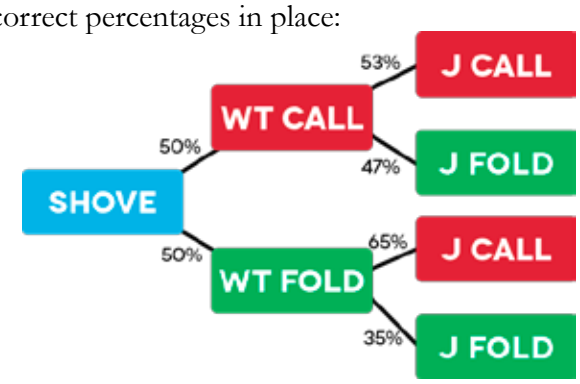
a tree diagram and then doing the math accordingly. If we shove there are essentially 4 different outcomes (or branches of the tree):

1. WT calls and Jack calls
2. WT calls and Jack folds
3. WT folds and Jack calls
4. WT folds and Jack folds

In three of those outcomes we lose money since our Queen high will never be good once called. The only time we win is when both players fold and we pick up the $1,217 uncontested. But we also need to remember that we can lose varying amounts of money in certain branches. In branch 1 and 2 we lose our full $625 since the WT player covers us. But in branch 3 we can only lose $325 since the WT player folds and we lose against Jack. The tree then looks like this:



Next we need to plug in percentages of folds. Well we know the WT player is going to fold 50% and call 50% based upon our assumptions. We also know that he calls with T9s and folds with 97s. So when he calls with T9s it will influence the combos left in Jack's range. When he folds 97s it will allow for more combos of Tx in Jack's range. The WT player's action influences combos which in turn influences the number of folds we can realistically get from Jack. Now the tree looks like this with the correct percentages in place:



From here it's just a plug & play situation. We multiple the percentages of each branch by the money we would win/lose then sum up the results of all branches. In this hand that means:

Branch 1 = (-$625*0.5*0.53)
Branch 2 = (-$625*0.5*0.47)
Branch 3 = (-$325*0.5*0.65)
Branch 4 = ($1,217*0.5*0.35)

The sum of all branches equals -$205.15 meaning that Hero's shove is very -EV. Of course, it's -EV given the assumptions I made both in terms of ranges and frequencies. If you change any assumption, even just slightly, the entire EV will change. The better you get with hand reading and combo analysis the easier this kind of thing will be…so make sure you keep working on it.

In real-time you won't be able to run this kind of poker math in your head. But enough practice and exploration will allow you to eyeball these things easier at the tables. Given the assumptions I made Hero should be checking the river behind and cutting his losses. There is something to be said for playing a draw aggressively when it misses…but this doesn't look like the right spot for it.

Even if you didn't like the hand, or you disagree with the range analysis, the big concept to take away from this is how to solve the EV in complicated spots. Whenever you get confused start by drawing that tree diagram. Think about the logical branches and just multiply each branch by the expected win/loss dollar amount. This is a great way to study hands away from the table and get reps with combos, ranges, math, and eyeballing the EV of new spots!

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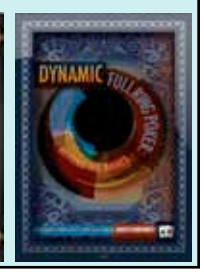

Don't be Easy to Read (Unless You Want to Be)

"Are you always so blatant?" a poker buddy, Martin, asks me. I smiled. After reading my book, he knows my game pretty well. We get together every trip I take to Vegas and have lots of hand review sessions. Since I live in Boston, it was the first time we had ever gotten a chance to actually play at the same table.

He was asking because against certain Villains, I was constantly taking transparent lines. Every time a perfect bluffing spot came up, I would bluff. Is it bad to be transparent like this, I mean Martin knew I was bluffing -- every time. I don't think this is bad at all. I am not trying to beat Martin, I am trying to beat the other people with cards in that hand. Even if every other player at the table can see what I am doing, their votes don't count because they don't have cards anymore.

I am talking about story telling bluffs. Hands where the Villain folds and says "I am not paying off your set." or whatever boogeyman I am representing. I am taking advantage of two things: Villain's ability to read hands and Villain's memories of how most people would play the hand I am representing.

For instance when I call a raise from a tight player to defend the big blind and the flop comes:

I check/min-raise the flop then bet turn and river, my represented trip Sevens never gets to showdown. Villain feels very clever for outplaying me in that hand by having the discipline to lay down his overpair. Martin knew I would never play a flopped Seven that way against this Villain. Why not? Because he would never pay me off if I play it like that. A really good player would know I am capable of three barrel bluffing in this spot and might look me up or raise me. A really bad player would just call me down because he likes to call. It is the mediocre regular that is vulnerable to this play, and that is why I made it against him but not against Martin or a calling station

Another example: When I am on the button after calling a pre-flop raise and four players check to me on a board of

I bet half pot on the flop and get one caller. I then bet the same amount on the turn. When I make a pot sized bet on the river, I never get my represented trip Jacks to showdown. Lots of people will try and milk other players with small bets on the flop and turn then bet big on the end hoping to get paid off. A mediocre player knows this and might call the two small bets but will release often enough that the line works very well against them.

Martin is watching my shenanigans in this hand and is thinking the Villain just needs to raise me to win a monster on the river. The good thing is Villain does not think like this. These exploitative, transparent bluffs work very well because they are so easy to read.

What else do these bluffs tell you? These lines work very well as bluffs because they emulate the way bad players try to get tricky with big hands. It takes a big hand for many bad players to confidently bet big and check-raise like I did here. If these lines rarely get paid off for big money when you actually hold the big hand there has to be a better value line to take. Bad players like to get tricky in these spots, but the trickiest thing to do is just bet it out.

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Poker's 1% continued from page 3

Let's develop a frequency-based strategy for all the hands you can have and see what we might do with KdJd at each point in the hand.

Preflop, you call the raise. This is certainly not a call you'd make 70 percent of the time. Since you are one of five players the opponent raised into, you five share the responsibility to call roughly 70 percent of the time. Realistically, to call a raise from a player three off the button, you need a fairly good hand to be on a level playing field.

Let's assume that you'd tend to reraise AA-QQ and AK. (In actually, I tend to flat some combinations of QQ and AK in this exact scenario.) And to go with these value reraises, you'd tend to reraise some hands as bluffs. I personally choose hands such as A5s-A4s, 76s-54s, AJo, and KQo, so let's assume you have chosen these hands to reraise with.

Your preflop calling range might look something like this:

JJ-22
AQs-A6s, KQs-KTs, QJs-87s, QTs-64s, Q9s
AQo

This range represents 168 hand combinations or 12.7 percent of all hands.

JJ	AQs	QJs	
TT	AJs	JTs	QTs
99	ATs	T9s	J9s
88	A9s	98s	T8s
77	A8s	87s	97s
66	A7s		86s
55	A6s		75s
44	KQs	Q9s	64s
33	KJs	AQo	
22	KTs		

The flop comes Td7s2c.

This is a relatively dry flop in terms of flush and straight draw possibilities. But with the low high card, it's reasonably likely an overcard will hit on either the turn or river. Dynamic boards tend to favor the player with position, and this board is either average or slightly more dynamic than average. It's a flop that the player with position should defend with average or above average frequency.

The preflop raiser bets nearly pot on the flop. Let's say we want to defend (either call or raise) 70 percent of our hands. That's 118 combinations of the original 168.

Let's start off with the shoo-in combinations to defend. We have

JJ-TT, 77, 22
ATs, A7s, KTs, JTs-87s, QTs, 97s, 75s

That's sets, top pairs, and middle pairs. I excluded the pocket pairs 99 and 88 from the shoo-in list because I'd generally prefer to defend 97s middle pair versus 88 because of the extra outs when behind.

This is 46 combinations. If we defended only these shoo-ins and folded everything else, our folding frequency would be 72 percent—way, way too high. We need 72 more combos to defend to hit our target.

The next obvious hands are 99 and 88, so let's throw those in. And then I'd go with big aces and gutshots. These categories add the following hands:

99-88
AKs-AJs, J9s, 86s
AQo

That's 44 more combos. It's still not enough to reach our goal of 72. We need 28 more. Next I'd go to weaker aces and overcards that include a backdoor flush draw. This category includes the following hands:

A9s, A8s, A6s, KQs-KJs, QJs – all combos of these hands except those suited in hearts

That's 18 more combos. You need just 10 more. Take your pick from hands such as Q9s with backdoor draws, 66, 55, and overcard hands without backdoor flush draws. These hands are all pretty weak, but some hand has to be the weakest hand you defend. And the bar for defending is fairly low—it's zero dollars of profit on the $30 call (including the $37 in the pot). In other words, the weakest hands you defend should be pretty big underdogs to end up winning the pot, since the borderline hands aren't supposed to show any significant profit.

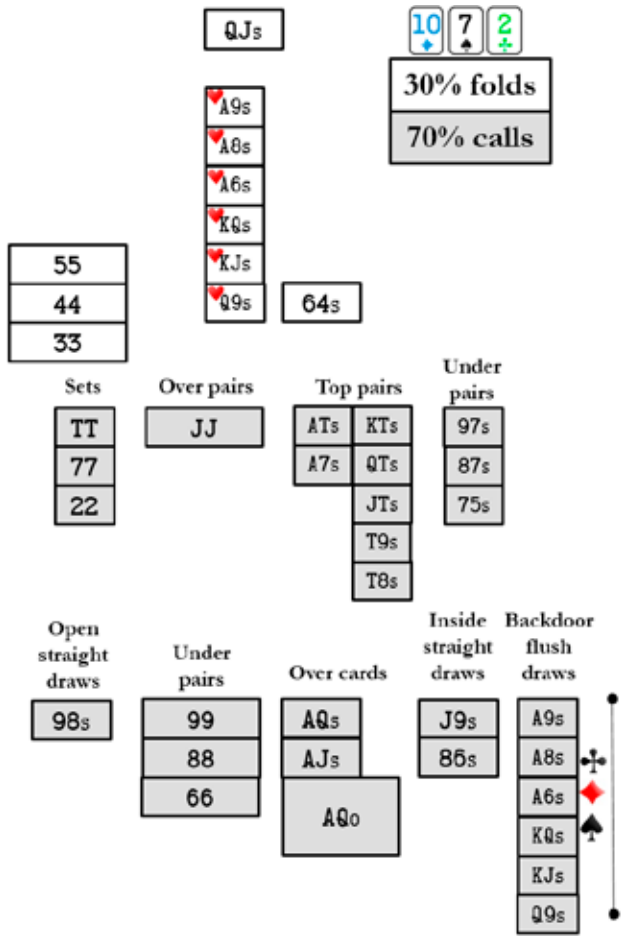
Let's go with a final range that looks like this:

JJ-66, 22
AQs-ATs, A7s, KTs, QJs-87s, QTs-75s
A9s-A8s, A6s, KQs-KJs, Q9s – all combos of these hands except those suited in hearts
AQo

That's 118 combos, exactly 70 percent of the ones we started with. For the sake of argument, let's assume that we raise none of these combos and call with all of them. (On this particular board type, there isn't a lot of incentive to raise, so this simplifying assumption isn't too bad.)

You may be thinking, "Wow, Ed, that's a lot of hands. I'd usually be folding a good chunk of these."

Guess what. You fold too much! By folding so much, you reward your opponents for making excessive continuation bets out of position on flops like these.



"But, Ed, isn't that how the fish play?" you ask, perhaps not yet convinced in the error of your over-folding. Sort of, yes. This is how the fish play. But this is the part the fish get right. Remember back to my pyramid example from before. The pyramid with the open top represents the call-it-all-down fish. The problem with their strategy wasn't the calling frequencies after the flop. It was the fact that they started out preflop with way too many hands. So even though they are calling correctly with many of these hands after the flop, they have a lot of extra junk hands in their ranges that we don't have in this example. It's all this extra junk that they must get rid of (and can't hide) that ultimately dooms them.

Remember that refusing to fold after the flop can be very frustrating, especially when the player refusing to fold is the one who has position and the board could change a lot on future cards. That annoying player refusing to fold is you.

So you call with your KdJd, since it's on the list.

The turn is the As. It's an interesting card. Many players would jump to the conclusion that this card benefits the preflop raiser. But if you look at the range of hands you called with on the turn, you'll see that it contains plenty of aces. There's no reason to think that the preflop raiser has an ace more frequently than you do.

It is no worse than an average card for you. Your opponent bets $65 into $97.

He's backed off the nearly pot-sized bet on the flop with a two-thirds pot-sized bet on the turn. Because you have position, because the turn card is at least average for you, and because you are being offered better odds, you should defend with at least 70 percent of combos again.

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Know The Odds

Part 4 of Poker Is A Skill: Stop Losing

Expected value is one of the most important concepts in poker, in all types of gambling, and in life. It represents the mean outcome of any decision.

When you flip a fair coin, it will come up heads half the time and tails half the time. If we make a bet where I owe you $1 when it lands heads and you owe me $1 when it lands tails, that would be a fair bet. The expected value for each of us would be $0. Neither of us profits from making this bet, but maybe we have a little fun.

If instead of betting $1 straight up, I laid you odds of 2-to-1, meaning that I give you $2 when you win and you give me $1 when I win, then you would have a positive expectation and I would have a negative expectation. For every 2 times we toss the coin, I would expect to lose $2 and win $1. That's a net loss of $1 over 2 flips. One dollar divided by two equals fifty cents. So the expected value of a single flip of the coin would be negative $.50 for me, and positive $.50 for you. That's a good bet if you can get it.

What if the coin were not fair? What if I had Harvey Dent's coin (before he lost half his face)? It wouldn't matter what odds I offered you. I'd always win the bet. In the case of our $2-to-$1 bet, my expectation would be positive $1 per flip, since I would always win and never lose.

Let's do one more complicated flip. I read somewhere that a quarter does not come up 50% heads and 50% tails. It's more like 70% tails and 30% heads. I read this on the internet, so it's probably a load of crap. But humor me. Let's say I find a coin which is weighted in such a way that it lands tails 70% of the time. Now when I offer you $2-to-$1, I'm actually making money. We'll do the math:

30% of the time I lose $2, so that's -$.60. 70% of the time I win $1, so that's +$.70. We simply add those two numbers together and get $.10. I come out ahead a dime every time we flip the quarter. My expected value on this coin flip is ten cents.

Poker works much the same way as these coin flips. Your odds of winning are changing from hand to hand and street to street. The odds you get from the pot change with every bet and call. What you need to do is calculate the odds and figure out what sort of coin you're flipping.

Maybe this sounds complicated. It is. But it's not. The basic math of poker is arithmetic, not calculus. As you improve, you can work on more complicated equity calculations, but for this article we'll keep things simple. We'll look at drawing to a straight.

Let's say you're playing No Limit Holdem and you hold JcTc. The flop comes out 9h8d2s. You have what we call an open-ended straight draw. Any queen or seven will give you the best hand. Let's further stipulate that your opponent holds pocket aces. She likes her hand a lot and bets the flop. What are your chances of improving to the best hand on the turn?

Well, there are four queens and four sevens, so there are eight cards remaining that will help you out. We call those outs. There are three cards on the board, two cards in your hand, and two cards in your opponent's hand. That leaves 45 unknown cards (52 minus 7). If we didn't know what your opponent held, then we'd have 47 unknown cards. Dividing 45 by 8 gives us 5.625. So there is a 1 in 5.625 chance that you will improve on the turn. But how does that relate to odds? What you want to do is compare the 8/45 of the time that you improve with the 37/45 of the time that you do not. So we can divide 37 (the cards which do not help you) by 8 (the cards which do) and get 4.625. So the odds against improving are 4.625-to-1. You can see that we could have just subtracted one from the 5.625 and gotten 4.625. If you think about the way we say these two things, it makes sense. 1 in 5 is the same as 1 against 4. Or 1-to-4.

So with odds of 4.625-to-1 against you improving, it would seem foolish to call a pot-sized bet hoping to hit your straight. If there is $10 in the pot and your opponent bets $10, you must risk $10 to win that $20, so you're only getting 2-to-1 on your money. Even if your opponent only bets $5 into the $10 pot, you're just getting 3-to-1 now (you call $5 to win $15).

Does that mean that you can never call with a straight draw in No Limit Holdem? Of course it doesn't! The real story is more complicated.

Implied Odds

When you call the flop with a straight draw, you're not just hoping to win the money in the pot. You're hoping to win much more than that.

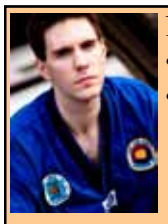
Let's say you call the $10 bet on the flop, putting $30 in the pot. The turn is a queen. You have the nuts. Your opponent still likes her pocket aces, so she bets $30. You raise all in to $100. She calls even though she's drawing dead.

For the $10 you won on the flop, you won $120! That's 12-to-1. Much better than your odds of hitting your straight. That means your call on the flop was good, right? Maybe.

In this example, your opponent was willing to go broke with one pair. You won't always be so lucky. Estimating your implied odds is a tricky thing. You need to consider your opponent's range and how she's likely to play it on future rounds of betting. If she has $100 left in her stack, you can't assume that you'll always win all of it unless her range is very strong or she's a maniac.

So we started with the cold hard math of pot odds, and now we're exploring the soft fuzzy art of implied odds. It's math and science and art and intuition. That's poker. The takeaway here is that you need to begin by figuring out how likely you are to win the pot, and then you must estimate how much you'll win when you do win.

I can give you a little cheat sheet for the math of the equation. Experience, perception and inference will have to provide the answer to the other side.



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Outs	1 card coming Odds	%	2 cards coming Odds	%	Type of draw
2	22-to-1	2%	11-to-1	4%	Set draw (postflop)
4	10.5-to-1	4%	5-to-1	8%	Gut shot
6	6.7-to-1	13%	3.2-to-1	24%	Overcards
8	4.8-to-1	17%	2.2-to-1	31%	2-way Straight
9	4.1-to-1	19%	1.9-to-1	35%	Flush
12	2.8-to-1	26%	1.2-to-1	45%	Flush and gutshot
15	2.1-to-1	32%	.85-to-1	54%	Flush and straight

Poker's 1% continued from page 5

Let's go with 70 percent. Since the As was used in 9 of the 118 combos you called the turn with, you're down to 109 possible combos. You want to defend at least 70 percent of these, or 76 combos.

Let's start again with shoo-ins.

TT, 77, 22
AKs-ATs, A7s
A9s-A8s, A6s suited diamonds or clubs
KQs-KTs, QJs-98s, QTs-T8s, 86s, Q9s – all combos of these hands suited in spades
AQo

That's 47 shoo-in combinations of top pair or better or a backdoor spade flush draw. If you were to fold everything weaker than these hands (and this is precisely what many regular no-limit hold'em players do), you would be folding 57 percent of the time! Again, this is way, way too often. I can bet two blank cards on the turn for a huge profit against this sort of player.

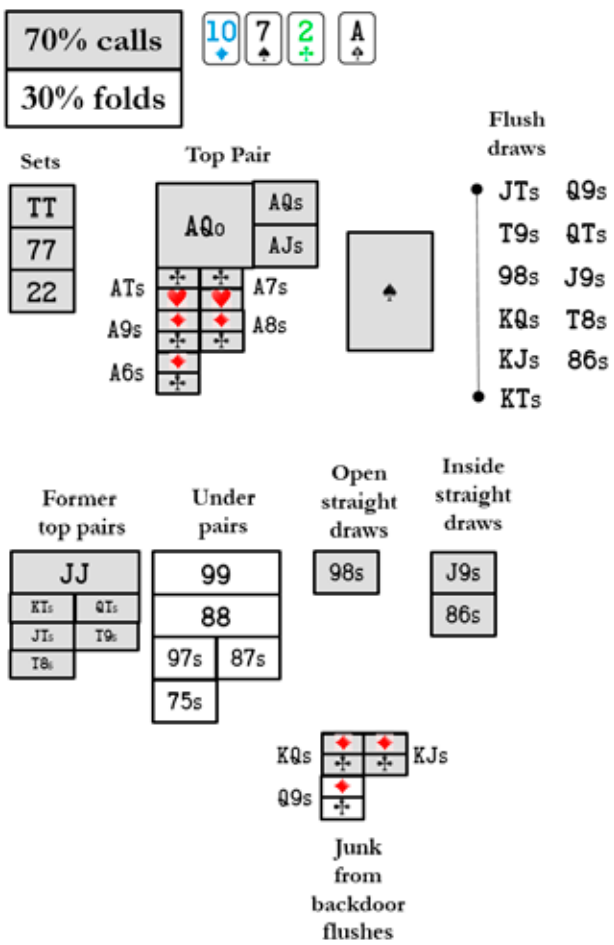
We need 29 more hands to defend. Let's start by keeping JJ and the hands with a ten in them.

JJ
KTs, JTs-T9s, QTs, T8s – all combos of these hands except those suited in spades

That's 16 hands. We're getting close. We need just 13 more combinations.

I'd pick the open-ended straight draw 98s (not spades) next. Now we need just 10 more combos.

Candidate hands would be the gutshots: KQs, KJs, QJs, J9s, and 86s NOT suited spades. Because we didn't carry forward the big hands with diamonds in them, that's 12 combos.



Other possible candidate hands would be the hands with sevens or 99 and 88. I personally prefer the gutshots since they still have big hand potential while the small pair hands are hanging on for dear life at this point.

It wouldn't be wrong to defend a small number of extra combos as well, but for the purpose of this exercise we can stop with these.

At this point in the hand, we likely want to raise our strongest hands such as TT, 77, 22, ATs, and A7s. This raise denies a cheap river card if our opponent holds backdoor spades or one of the now-numerous gutshots. It also extracts value those times our opponent holds a big ace.

If we raise exactly the hands I listed above, we will be raising 14 combos. Due to a frequency rule I haven't yet introduced, if we raise 14 combos for value on this turn, we will also want to raise approximately 14 hands as bluffs.

The gutshots and 87s work well for this purpose since they have little showdown value, while they also have the potential to win stacks if the turn bluff is called. Backdoor flush draws with no pair are also candidates to raise. There are more than 14 combos of these drawing hands with weak showdown value, so you can pick 14 of your choice and raise them.

There is also merit in choosing one or two combos of sets and flat calling with these to preserve nutted hands in your range on blank river cards. This is a more advanced concept and it doesn't really change things too much.

In the actual hand, you held KdJd and folded to the turn bet. Having gone through our frequency analysis, it turns out that KdJd is a marginal hand in your range. It's right at or near the bottom of the set of hands that you might want to defend against this turn bet.

Because it's a marginal hand, it's likely that raising, calling, and folding this particular hand all have roughly similar EV. Because it's clearly a superior hand to the small gutshot hands J9s and 86s, I'm likely not folding KdJd to the turn bet. I'd probably end up raising it, along with 98s, and a few combinations of low showdown value flush draws. These are the bluff combinations that complement the value raises I'd make with sets and aces up.

Back to the original question. Holding KdJd, you call the Td7s2c flop and fold the As turn. Did you play the hand well? I believe that folding KdJd is a small mistake, and raising would be a preferable play. Calling is also a reasonable option, but likely not quite as good as raising.

But if you chose to fold KdJd (and similar high card gutshot hands), and instead chose to call with 99 instead, it would make your overall strategy only slightly weaker. Because your frequencies are still solid—you are still defending the correct percentage of hands overall—a flaw in your choice of which particular hands to defend is of secondary importance.

The way you eviscerate your strategy is if you get the folding frequency grossly wrong. Start folding 50 or 60 percent of hands instead of 30, and you're just killing yourself. If you play like most regular no-limit players, you make precisely this mistake on many turn and river cards.

The range-building, frequency-based analysis I just did on this hand, this is what you do to learn to play like an elite player. You do this analysis over and over again. Every time you play a session, you write down at least 1 to 3 hands you played and then perform this sort of analysis.

The hands you choose need not be the biggest pots or the nastiest beats. My example, for instance, is a seemingly mundane hand. You flopped overcards, took one off, and folded your gutshot to a turn bet. A hand like this one is unlikely to be one that you think about for days afterwards. But these decisions are the bread-and-butter of no-limit hold'em. These situations are where the edges are made and lost. It's all in the frequencies. You want to make sure your frequencies are solid in hands like these. Make sure your pyramids are smooth. Don't give your opponent opportunities to bet two blank cards and beat you.

We'll go through more examples like these as the book proceeds and I teach you a few other key concepts. But I wanted to address the complaint I hear most frequently when I introduce students to this sort of analysis. "How am I going to do all this at the table? I've got ten seconds to make a decision. How the heck am I going to count through a hundred hand combinations to get my frequencies perfect?"

You aren't. This analysis is not done at the table. The only thing that happens in those ten seconds at the table is that your brain recognizes similarities between the present hand and ones you've seen before. Then you make an intuitive decision. Your brain—after repeated analyses away from the table—learns to program itself to make these decisions much like a computer.

It's muscle memory, except no muscles are involved. It's the same way the violinist knows in a split second exactly where to put her finger to play the note she wants. It's the same way the tennis player knows precisely how hard and at what trajectory to swing the racket so it ricochets the ball hard and straight down the line. It's muscle memory. You train your brain in practice, and then in the heat of the moment it gives you instant feedback. The more you train, the more sharply accurate the message from your brain.

So learning to play poker like the 1% is both simple and hard. All you have to do is analyze the hands you play in the manner I analyzed the example above. The hard part, of course, is that you must do it thousands of times on all different sorts of hands to become elite.

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Bluffing the Turn continued from page 1

If I had A♣5♣ on an 8♣6♥4♥2♣ board, I'd almost certainly bet the turn again and plan on folding to a raise as opposed to check-raising. Evaluating pot equity is easy: we look at how many outs we have, and through simple memorization, we know that the nut flush draw usually has between 40 and 50 percent equity. A gutshot has about 18% equity on the flop. Pretty simple. Evaluating fold equity, on the other hand, can be a lot more difficult. What factors affect our fold equity?

Player type. This is by far the most significant factor in evaluating fold equity. Against a bad player (whether bad-passive or bad-aggressive) our fold equity is greatly reduced, simply because they won't fold very much of anything. The response is easy—we have a wider value bet range, but we can't continue aggression with weak hands that rely on fold equity.

Board Texture. This, as we just discussed, is vital to understanding fold equity. If, on a 983r flop, an Ace lands on the turn, our fold equity will increase. If a T peels off on the turn instead, our fold equity is decreased. This part is easy to read as well—overcards increase fold equity, but low cards and coordinating cards don't.

Number of players. This is an obvious one. If there are more hands in play, there are more cards that could've connected with the board, and thus our fold equity goes down.***

Image and Perceived Hand Range. We'll go into this in greater detail in the Advanced Section, but if we have a loose and bluffy history, our fold equity decreases. If we have a tight, solid history, our fold equity increases. This is because our perceived hand range becomes either weaker or stronger.

Sometimes, these reasons play against each other. The board might be very scary on the turn when an Ace falls, but the player type is loose-passive and thus we shouldn't continue our aggression. Other times, we'll be in a multiway pot, but the board will be dry and they'll both be tight players, so we'll want to be aggressive. It's the job of the poker player to balance these factors.

This was an excerpt from Easy Game

**In this equation, you can think of Aggression as a constant—a magic number of combined PE and FE. So, if PE+FE don't add up to the magic number, then you can't be aggressive. However, sometimes you may have so much FE that you really need 0 pot equity. Bluffing the river is the most obvious example of this—there is no more pot equity because you can't draw out on a later street. So, you're only dealing with fold equity.*

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***Actually, if your opponent has a lot of those pair-plus-gutshot hands in his range, I'd usually prefer to bet three streets. You'll nearly always get a call on the turn and a fold on the river when they miss their draw. However, if he's aggressive enough to bet the turn, and he'll fold to a check-raise, it's still better to check-raise.*

****This is true in that you're playing against a strong range (i.e. 4 cards instead of 2). But, against regulars, you may be able to get them to fold better hands given the strength of your line. This is considered in the Advanced section in the chapter "Advanced Fold Equity".*

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