Riichi Reference Document

By Erzzy

These are my notes from reading various Japanese Riichi Mahjong strategy books. Think of it like the Umamusume Reference Document, but for Riichi Mahjong. This is not a “guide written by me,” it’s “information compiled by me.” Said information is from some videos and these books:

This is for the standard online format, with open tanyao allowed, red fives, ippatsu and ura dora, no shuugi or almighty haku, etc. This is aimed towards four-player, but many things also apply to three-player. I might add a three-player section later.

This will generally assume you have read and understood Riichi Book 1. You should be around 4 dan on Tenhou, or Master on Mahjong Soul. Below that, you should probably keep working at Riichi Book 1 for now. Five Block Theory and Suji should be familiar concepts. I will also primarily be using the Japanese terms, as they are the ones I am familiar with and they tend to be shorter. I also sometimes just don’t know the common English term for it. Refer to the Riichi Wiki’s list if anything is confusing.

I will use tile shorthand rather than images when talking about shapes. For example, 123m456p789s. The “m” means “manzu / of characters,” the “p” means “pinzu / of circles,” and the “s” means “souzu / of bamboo.” I don’t think the ASCII tiles look good… 

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Changelog

01/28/2026: Started adding some AI information, eg Appealing to AI
01/23/2026: Filled in gaps, added notes from more books, and public release
01/18/2026: Edits following review by an 8-dan Tenhou player
01/17/2026: Feature complete except for 3-player information

Future plans: Sanma? More tile pictures? More books? Wall reading, lag reading, people reading?

How to Use This Document

Much like the Umamusume Reference Document, you don't need to read this from front to back in one sitting. That would probably help you very little.

To start, scan the table of contents and look for anything that jumps out to you as something you want to learn or work on. If you're feeling lost and overwhelmed, major divergences from Riichi Book 1 include the Push/Pull criteria and the Honitsu criteria. Areas mid-level players commonly make mistakes in include Sakigiri and Point Situation Considerations. You can start there.

Once you identify something that you think sounds good and you want to incorporate into your game, make your own notes on it and spend some time working it in. Try to stick to working on only a few concepts at a time, particularly ones that don't overlap much. If you add in all sorts of things at once, you'll get overloaded, forget things, and your usual style might struggle to keep up. Take it slow.

Learning goes in four stages:

1. Unconscious Incompetence: You don't know what you don't know. This document will hopefully clear up some of these unknown unknowns
2. Conscious Incompetence: You recognize you're making mistakes
3. Conscious Competence: You know how to do it, but have to think about it and pay attention
4. Unconscious Competence: You do it automatically with little to no thought

If you have a lot of skills at the "Conscious Competence" level, then when your mindset isn't good, when you're tired or tilted, they fall away and you use your "Unconscious" skills instead. This leads to big variance in your play. Or, focusing on one makes you forget about another. Bringing them to the "Unconscious Competence" level first before moving onto another will keep your play stable. The mistakes you make while "playing poorly" will reveal what skills you might think you have at "Unconscious Competence" but do not. If they were truly unconscious, you wouldn't make those mistakes even on autopilot.

Process-related skills are best obtained through practice. No matter how much you study, at the end of the day, you just have to use them to improve and drill them into habits. And, improving skills that you've already turned into habits is very difficult without consistent, targeted practice. How much typing do you do each day? With all that practice, how much have you improved? Practice alone isn't sufficient to improve.

As you get stronger and stronger, the gains get smaller and smaller. Once you run out of things that make you 10% better, you have to find ten things that make you 1% better. Once you run out of things that make you 1% better, you have to find ten things that make you 0.1% better. You may wish to look into the "Region Beta Paradox," which is where we aren't motivated to change if things are only slightly bad, or "the OK Plateau."

The format of this document also tends to be “notes.” I won’t go into depth about the topics with lots of examples on each thing. They’re mainly the lessons I have gathered from the books, or perhaps you could call them summaries. Maybe even introductions. You’ll have to do some of the thinking yourself, or find more detailed guides on the particular topic. The lack of repetition also means some things that might be important only appear in one paragraph and then aren’t mentioned again. Including this warning!

Mentality

Before anything else, you should evaluate whether you have any mentality issues when it comes to mahjong. Resolving these will help your game much more than any strategy advice, and can have impacts outside of mahjong as well, improving your life as a whole.

There are a lot of different manifestations of mentality issues. If you think any of the following while playing…

- “There was nothing I could have done in that game.” (Excuse to not learn)
- “Why are my opponents always so lucky?” (Injustice tilt)
- “When will it be my turn to have the luck?” (Also injustice tilt)
- “Stop emoting!” (Disrespect tilt)
- “Why would you chase/dama/call with that hand?!” (Type A energy)
- “How did I make such an obvious mistake?” (Mistake tilt)
- “One more game, come on, give me a win!” (Desperation tilt)
- “Why am I losing to these kinds of players?!” (Entitlement tilt)
- “I’m just cursed.” (Excuse to not learn)
- “The flow’s not with me today, let’s stop here.” (Predicting bad luck)
- “I’m not feeling my best right now, let’s not play.” (Perfectionism)
- “Am I even a good player?” (Lack of confidence)
- “I’m unstoppable right now!” (Overconfidence)
- “That’s so unfair.” (Injustice tilt)
- “You’re going in the Death Note, buddy.” (Revenge/Disrespect tilt)

Or if you do any of these things…

- Dama hands you know you should be riichi’ing (Fear)
- Fold hands you know you should be pushing due to fear of dealing in (Fear)
- Push hands you know you should be folding because you want a win (Desperation)
- Complain about your bad luck or opponents to others (Injustice/Entitlement tilt)
- Feel jealous when seeing others’ successes (Injustice/Entitlement tilt)
- Constantly think over earlier decisions while still in the game (Mistake tilt)
- Disconnect from games that are “obvious losses” (whole lotta things in this one)
- Uncharacteristically keep safe tiles in the early game (Fear)
- Go down a room now and then, just to have weaker opponents (Fear)
- Brush off mistakes in AI reviews as too minor to matter (Excuse to not learn)
- Feel there’s a wide gap between when you’re playing your best and playing your worst

Then please put this down and read the book "The Mental Game of Poker" by Jared Tendler first. It's about poker, but both poker and mahjong are high-variance mental games, and the different types of mental issues and tilt are largely the same between them. Not only will it help you solidify your skills and teach you how to improve, it'll help you enjoy playing mahjong more.

If you can't get the book, Jared Tendler did a pair of webinars which go over much of the same content, though in less detail:
Stake Me To Play - Mastering the Mental Game of Poker - Jared Tendler
Stake Me To Play - Part 2 of 'Mastering the Mental Game of Poker with Jared Tendler'

Mental Biases in Mahjong

There are a lot of biases that can influence your perception of mahjong. Here are a few. Being familiar with them can help you avoid them.

Negativity Bias
https://en.wikipedia.org/wiki/Negativity_bias
In short, this is our brain's preference towards remembering negative events more than it remembers positive events. As a consequence of this, you'll remember things like calling riichi and immediately drawing an upgrade more than you'll remember calling riichi and winning ippatsu. This is where the bad habit of "I'll wait one turn to call riichi" comes from. You'll also remember pushing and dealing in more than you remember pushing and winning, which can lead to you being more timid.

You can't trust your brain to remember these sorts of things accurately. Either trust the statistics, or keep track manually.

Prospect Theory
https://en.wikipedia.org/wiki/Prospect_theory
Similar to above, this deals with our natural inclination to avoid losses over chasing equivalent gains. In online ranking systems, fourths are usually disproportionately punished, so there is merit to avoiding loss. However, you have to be careful that this isn't also making you avoid doing good pushes or good riichis or similar. Excessive folding or dama could be a manifestation of this, or it could be simple fear.

Anchoring Effect
https://en.wikipedia.org/wiki/Anchoring_effect
The first piece of information we receive influences how we view all our future decisions. If you look at your starting hand, and form a plan for it, that plan can influence your future discards in a negative way. Maybe you miss when a new tile you draw enables a sanshoku because you're focused on tanyao. You have to make sure to evaluate the new situation as it is. This can affect stronger players even more.

Illusion of Control

https://en.wikipedia.org/wiki/Illusion_of_control
This leads to all sorts of problems. If you think you deserve to win against worse players, if you think you can win every hand, or think you can see the bad luck coming, or the good luck, or so on, it comes from some deep belief that you have more control over the situation than you do. The tiles are random. You cannot control them. Do not look for patterns between hands or try to predict them. You can only control your reactions to them.

Tile Efficiency

ウザク式麻雀学習 牌効率 - Tile Efficiency
令和版 現代麻雀技術論 - Modern Mahjong Strategy

Tile efficiency is the skill of building the best hand. More than the speed of getting to tenpai, we want to think about the speed of winning, our final wait, as well as how much value our hand has and whether we can call it, all while adjusting to the ever-changing board state. I will assume you're already familiar with Five Block Theory from Riichi Book 1 or elsewhere and go from there.

Tile efficiency is the core of mahjong. With good tile efficiency, you create hands that are worth calling more often, hands that are worth pushing more often. Everything starts with efficiency.

With the basic five block theory down, all the major strokes have been taken care of. Moving forward from there is a lot of little things that all add up. Every small edge makes you that much faster than your opponents. Do sweat the small stuff.

Tile Efficiency Principles

Here are the general principles for tile efficiency.

1. Prioritize ukeire over upgrades
2. Prioritize ukeire over safety (see: Sakigiri)
3. Prioritize speed of winning over immediate ukeire
4. Prioritize ukeire that leads to an expensive hand over the widest ukeire
5. Mangan value and ryanmen waits are good enough. Don't increase sanmenchan/haneman chance at the cost of ryanmen/mangan chance

There are also principles for upgrades, such as tiles that can give you better waits or higher value. Things that improve your hand without advancing it in shanten.

1. Prioritize immediate upgrades over distant ones
2. Prioritize the quality of upgrades over the quantity (keeping in mind rule 5 above)
3. Consider upgrades more when you have a high value floating tile
4. Consider upgrades more when you have a low value block

5. Rather than reduce your ukeire for upgrades, consider going back in shanten
6. Consider upgrades more the further you are from winning

The rest of the chapter will be built off these. You can just learn the results instead, but if you don't understand why a certain choice is being made, you can check back here.

Basic Floating Tile Order

3/4/6/7 > 5 > Double Wind > 2/8 > Self Wind > Dragon > Round Wind > 1/9 > Guest Wind

All things being equal, that's the order you should be discarding your initial floating tiles in with a standard hand.

Some players keep terminals over yakuhai, as those have more tiles that can create blocks. But, those blocks are always bad shapes, so the loss isn't that big. ゆうせー (10d) suggests that order, and お知らせ (Tenhoui) says to do it when you're lacking blocks. Cutting terminals first is preferred by most AIs and higher call rate players, like ないおトン (3x Tenhoui) and（≧▽≦）(Tenhoui).

A terminal has 11 ukeire. It can get itself for a pair, or it can become a penchan or kanchan. A dragon has 3 ukeire. It can only get itself, but when it does, it gives you a path to either opening your hand, which increases your speed dramatically, or +1 han if you draw the third or riichi on the shanpon. Pick the order that feels best to you.

Whichever you choose, there are some more minor optimizations you can do:

1年に1回得する麻雀知識4選 - 4 Choices That Matter Once a Year

Guest Winds
By default, cut these counter-clockwise. Discard the player to your right's wind first, then the player across's wind, then the player to your left's. To understand why, just think about what happens if the wind gets called. If the player to your left calls the wind, two players' turns are skipped. So, you'll want to discard that one last, since it's the most beneficial if called.

Similarly, if the player to your left discards the player to your right's wind, and they call it, your turn will be skipped. That isn't good. Cutting the right player's wind first can get that call out of the way before it skips your turn.

In the South or later rounds, discarding the East wind first has value. If the dealer gets to call their wind, not only is their hand more expensive compared to the other players, they might get repeats. You will usually prioritize cutting that one.

Dragons

Dragon order is incredibly minor. But, if you want to be mathematically optimal, if you have all three tiles you should cut the green first, as there is an extremely slim chance that someone is going for the All Green yakuman, so you want to get it out before they can call it.

With two, cut the one that's the dora indicator for the other first. For example, with white and red in hand, cut the red first. If someone calls pon, then later calls kan, the red is one tile more likely to become the new dora. So, it's slightly more dangerous. Factor in the ones visible in the discards to be even more precise. "Green > Red > White" works for all cases except having Green+White in hand. This same consideration, in reverse, can be used when folding to reduce your chances of dealing into ura dora.

There is an alternative to mathematically optimal. The above is correct when playing against AIs that don't make mistakes, but against humans, you can cut the white first. The white is the hardest tile to wait on, because it's the easiest to notice in the discards. People can very easily confirm how many times it was discarded. Thus, waiting on green or red will have a slightly higher mistake rate from your opponents. This is reflected in data, with the white dragon having a *very slightly* lower winrate.

These things really don't matter. But, they can make bots like Maka happy with you. The true value is in padding your grades during AI reviews. Copying whatever preferences your AI of choice has can be a form of self-care as your grades / match% go up, letting you feel better about your play. Mortal's order is pretty weird, though.

3/4/6/7

Typically, 4/6 is better, because it connects to the red five as a ryanmen and also every block made from them fits into tanyao. However, blocks made from 3/7 have the highest win rates. 13 wins more than 24, 23 wins more than 45. If your hand doesn't care about tanyao, or you can already see the red five in that suit, you can cut them before the 3/7. In yakuhai hands, the 23 / 78 ryanmen are easier to call.

Discard Changes

Generally you should prioritize your own hand over interfering with other people. So, cut the once-cut guest winds before the live ones. Some people like keeping once-cut honors over live ones, since nobody calling pon means there's probably two left in the wall, but AIs prefer the live ones so that's probably mathematically correct. I haven't done the math personally.

If you cut a terminal, then draw the 2/8 that connects to it, the ryanmen would be furiten. You can cut these possibly furiten 2/8 tiles before the yakuhai. A possibly furiten 3/7 is still worth more than a yakuhai.

If a wind is discarded consecutively before your turn, you may want to put some thought into a four wind draw. If your hand is bad, you can cut the same wind for the off chance of a new hand, and if your hand is quite good, avoid cutting the wind if possible.

See also Appealing to AI.

Four Blocks (with Pair)

When we're in this situation, we want to form another block. We also want to prioritize good blocks, so we're aiming to maximize the chances of forming ryanmen or better. There are three main rules to follow here, to choose between which floating tiles of the same class to cut first.

1: The closer a floating tile is to a completed run, the better it is.

3456 > 3567 > 3678 > 3

You can probably tell by looking for most of these why they're good. Let's go over them one by one. The baseline, an isolated 3, has 24 for a ryanmen block and 15 for a kanchan block.

> Distance 0: 3456 has lots of ryanmen transformations (2457 for good wait, 18 for kanchan, 36 for pair). 3445 can be seen as two ryanmen. (2356 for ryanmen, 147 for pair, 35 gives +1 han) 3345 is the worst of these. (24 for ryanmen, 3 for entotsu, 15 for kanchan, 6 for pair, 45 gives +1 han)
>
> Distance 1: 3567 can become sanmenchan (24 for good wait, 158 for kanchan, 367 for pair)
>
> Distance 2: 3678 has one less kanchan option (24 for ryanmen, 15 for kanchan) but drawing 5 gives 35678 which can then become ryanmen on 2679
>
> Distance 3: In the case of a 2/8, 2678 drawing 4 then 5 gives a sanmenchan instead of a ryanmen, giving value over a normal 2/8. 2678m2p -> cut 2p

Further distances (like 2789) become extremely minor. 2789, draw 4 then 5, now you have 45789. You can no longer draw the 6 to shift the 789 down and get tanyao.

The one exception is 3789. Drawing 5 then 6, 56789 has one less acceptance than the 56 that would result from an isolated 3. But, you can claim +2 fu if you win on the 7.

2: The closer a floating tile is to an incomplete block, the worse it is.

3 > 378 > 367 > 356

Let's first look at the case where we draw into the inside ryanmen by drawing a 4:

3: 34 gives a new block

378: 3478 is two blocks (same as above in this case)

367: 3467 is two blocks with overlap on the 5, so 4 less ukeire

356: 3456 is still one block. It completed the 56 ryanmen rather than upgrading the 3. Lots of ryanmen transformations but no immediate progress on the block forming front

Now, let's compare the kanchan draws, the case where we draw 5:

3: 35 is a block

378: 3578 is the same block

367: 3567 has completed the 67 ryanmen, rather than upgrading the 3. It's a good block, but it is only one block

356: 3556 has overlapping acceptance on the 4, quite a sad shape

And now, from these shapes, let's imagine upgrading the kanchan to a ryanmen by drawing 6.

3: 356, discard 3, get ryanmen

378: 35678, this has completed the 78 ryanmen instead of upgrading our 35. There's overlap between the 78 ryanmen's acceptance and the 35's upgrades, and this minor difference results in 3 > 378.

367: 35667, discard 3, the block has improved but we still only have one block.

356: 35566, well, at least there's iipeikou chances

If we increase the distance further with 278, we can imagine drawing 4 then 5. We then have 4578, which results in two ryanmen that are overlapping on the 6. So, 2m78s is better than 278m, as we will have 4 more ukeire in 45m78s than in 4578m.

3: If the distances are equal, being close to a good block is better than being close to a bad block.

$$(378 > 379) > (367 > 368) > (356 > 355)$$

Let's go over the examples, which should show the reasoning clearly.

Distance 0: 233 > 335. Imagine drawing 4, 2334 is better than 3345.

Distance 1: 356 > 355. Imagine drawing 4, 3456 is better than 3455.

Distance 2: 367 > 368. Imagine drawing 5, 3567 is better than 3568.

Distance 3: 378 > 379. Imagine drawing 5, 3578 is better than 3579. After the 6 upgrade, 35678 has plenty of upgrades while 35679 is awkward.

Floating Tiles near Floating Tiles

15 > 1 > 14

When you have two floating tiles in the same suit, they're worse than an isolated one if they're separated by two spaces, and better if separated by three.

At two spaces, it's recognizable as a suji interval. In 14, the 4 is already accepting the 23, so the 1 is not doing anything.

At three spaces, we can make ryankan shapes. With 15, drawing the 3 gives us 135, a good shape. This isn't enough value to upgrade its class. You would still cut the 1 from a 15 before cutting an isolated 2, as a ryanmen is more valuable than a ryankan.

Sometimes, you'll have all three tiles of a suji. The only troublesome one is 258. In 147 or 369, you cut the terminal.

In 258, maximum ukeire is cutting the 5. However, maximum good shape ukeire is cutting the 2 or 8.

With 25, we get a ryanmen with 346, and a bad shape with 17.

With 28, we get a ryanmen with 37, and a bad shape with 1469.

The 25 shape has 4 less ukeire, but 4 more ryanmen ukeire, so it is preferred. "Prioritize the quality of upgrades over the quantity." (The 58 shape is the same, pick between 2 and 8 according to sanshoku chances or visible tiles).

Sequence-Breaking Shapes

There are some cases where the shape is so strong that it defies the usual discard order. Among these, even if a 1/9 is better than a 2/8, you may still choose to cut it first if the rest of your hand is tanyao.

- 1123 - Drawing 1 gives an entotsu, drawing 2 or 3 gives iipeikou, so this is worth keeping over a floating 2/8 (but typically not a floating 3~7).
- 1345 - This makes a ryanmen when drawing 2, and drawing 6 gives a lot of transformation options. This 1 is better than a floating 2/8. You can also chii the 2 if your hand has a yaku.

- 13458 - Drawing 6 gives a ryankan, drawing 5 gives good transformations after drawing a 3/6. This 1 is also worth keeping over a floating 2/8.
- 13457 - Though cutting this 1 removes a ryanmen chance, the ryanmen kanchan chance remains, so this 1 is cut before a 2/8 as usual.
- 2234 - Drawing 2 gives an entotsu, drawing 3 or 4 gives iipeikou, so this is worth keeping over a floating 3~7.
- 24579 - When you have enough blocks, this 2 should be kept over a floating 3~7. Drawing either 4 or 6 makes a ryankan shape on top of the normal transformations.

Four Blocks (no Pair)

In this case, we have enough shapes, but we need to create a pair. This case is quite different from the above case.

Floating Tiles

Any floating tile can become a pair, so there's no inherent hierarchy between them. The most important part becomes what you can see, how live the tiles are. If you have a penchan or kanchan in your hand, the middle tiles still have value to switch the bad shapes out for ryanmen.

Another thing to keep in mind is the chance of pinfu. If you have a pinfu hand with no pair, you will prefer to cut yakuhai tiles over terminals. If the terminals pair, they can be used for pinfu, but if the yakuhai tiles pair, they'll ruin your pinfu. Cutting the yakuhai first also makes it less likely someone will call them, allowing you to keep the speed advantage your good hand gives you.

Additionally, consider their value as a tanki wait. Suji 1/2/8/9 and random honor tankis have winrates comparable to ryanmen. Dora tankis are also always valid.

Pairing Shapes

When we have a pair, 134 is a very bad shape.

When we don't, 134 has plenty of ways to become our pair. Drawing 2, we get the nobetan shape 1234. Drawing 4, we have 1344, a kanchan + pair. Drawing 1 is obviously a pair as well. Compared to an isolated tile, this has two extra ways to make a pair. Since we don't need more shapes, we can keep this 1 over even floating 3~7 tiles.

Here are some other shapes that are great when you need a pair:

> 3456: Nobetans should be obvious. 36 gives a pair, 45 gives an aryanmen, and they can be our final wait if we get to tenpai without making a pair elsewhere.

23457: This is a run + kanchan. With this, we can draw any of 257 to upgrade the kanchan to a pair. This is a very good shape when we have no pair, and we can cut the 7 for a nobetan final wait.

23456: A sanmenchan. Of course, 147 gives us two complete runs, but we can also get a pair + one run on 2356, or change it to a nobetan if we get tenpai elsewhere.

67889: A penchan overlapping a complete run. Pretty bad in a hand with a pair, but when we need a pair, drawing 5689 will give us a pair + run.

23346: Nakabukure + 1 separated tile. Drawing 5/6 gives us a pair. 2 and 4 are also good draws. 1 can upgrade to 12334 or 12346, the latter having +2 pair ukeire.

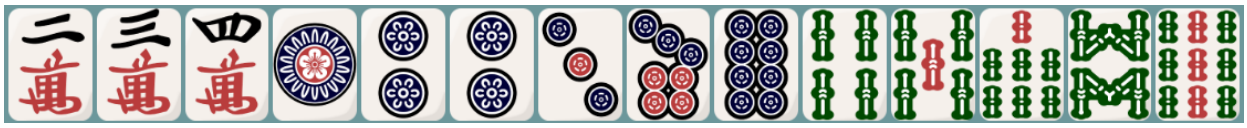
1123: Aryanmen naturally have pairs attached to them. They can be seen as a pair + ryanmen. You'll hold onto these longer when you need a pair.

444: When we have a triplet, we can trim it down to a pair if needed at tenpai. Drawing a 3 or 5 can turn this into a three-sided wait as well, and 2 and 6 are two-sided waits.

33577: This completes into a pair on a 3467 draw.

Pair vs Completed Run

Something else that might come up is the choice between completing a run or gaining a pair. Nakabukure and aryanmen are the prime candidates for this troublesome outcome. There's no universally correct choice. For example, consider a hand like this, which has no other pair candidate or pairing shapes:



Let's also assume none of the 123p are dora. If they are, the choice is obvious, pick whichever option keeps the most dora.

If we cut 2p to complete the run, we get tenpai on 6789p2345s.

If we cut 1/3p to take the pair, we get tenpai on 69p25s.

However, consider the ryanmen chances.

After cutting 2p, we get a ryanmen tenpai on 78p34s, which is twelve tiles. The others are tanki tenpais, which we might not even riichi with.

After cutting 3p, we get a ryanmen tenpai on 69p25s, which is sixteen tiles.

So, in general, cutting 3p will be the best here if you're not planning to riichi a tanki. Strangely, Maka usually rates confirming the run higher, but then won't take the riichi when it ends up as a tanki.

The tiles visible in the discards could change this. If you can see four or more of the 69p25s, then cutting 2p is better.

Yaku will also change it. If the 234m45s was shifted down to 123m23s, you might want to cut 2p for the sanshoku chance. If the 789s was shifted down to 678s, you'd prefer cutting 13p for tanyao. If any of 78p45s are dora, you'll prefer to cut 13p to avoid needing to cut the dora when the other tile in the shape pairs. Or maybe you prefer 2p for the dora tanki/pair chance. If 4p is the dora, you'll prefer cutting 2p, to either slide to 234p or make a 1234p nobetan.

Another consideration is that, after cutting 3p, we can switch the 1p out for a safer tile, which can have value in the mid-game or later. Additionally, open hands much prefer to confirm the pair here, as the chii ukeire is very strong for them.

If you have any other pair candidate, you should generally just confirm the run. Any complex shapes like…

- 45678 - Can cut 48 for a nobetan
- 56778 - Can cut 8 for an aryanmen
- 66778 - Can cut 7 for an aryanmen

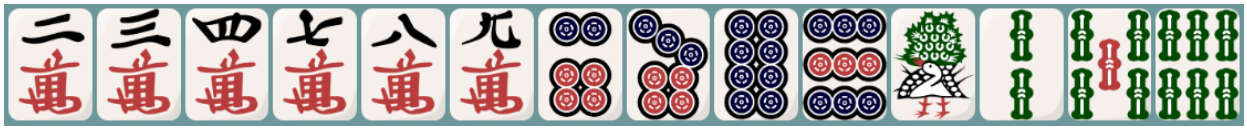
These can fill your need for a pair just fine, so the good shape ukeire is highest when confirming the run.

However, even here, you may still want to take the pair over the run. Obviously, 45678 can be a three-sided wait, and 66778 can become iipeikou. Even though the speed is higher when confirming the run, you might confirm the pair instead and aim for the lucky outcome depending on the situation.

Four Blocks (complex shapes)

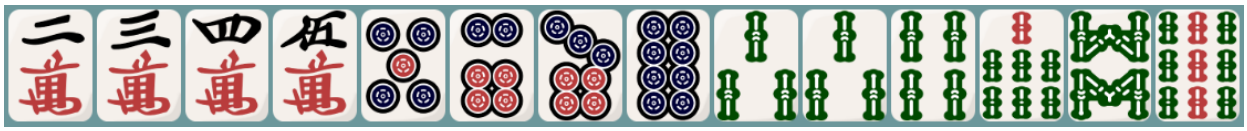
Yonrenkei

These are shapes with four tiles in a row, like 3456. They can make pairs and ryanmen easily. If you have plenty of run blocks, but no pair candidate, they are extra valuable.



Cutting 9p, there's 24 ukeire, 6 of which gives a good wait.
Cutting 1/2s, there's 17 ukeire, all of which gives a good wait. So, cut 1/2s.

When in the middle, these are very strong shapes, so you generally don't cut them until tenpai without a very good reason. There are some choices to be made when you have two.



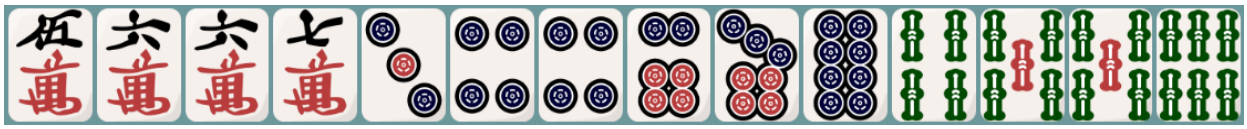
Our choice is between confirming the pair by cutting 4s, or trimming one of the yonrenkei.

Cutting 4s, there's 50 ukeire. 1346m4679p3s leads to a good wait.
Cutting, say, 2m, there's 41 ukeire. 456789p235s leads to a good wait.

The good wait ukeire the same, so if you have a reason, you can trim. For example, if there's a potential sanshoku involved, or it confirms tanyao, etc. If you wouldn't accept a bad wait tenpai (i.e. the hand has no value) then the 9 bad wait acceptance might as well not exist.

Nakabukure (Bulging Shape)

These are runs with an extra tile in the middle, like 3445. There are no kanchan transformations, so they can always give pinfu. With these shapes, confirming a pair is often valuable.



Cutting 3p is one ukeire more than cutting 5s.

If the 5667m is a 4456m instead, it's the same outcome, one tile better. As usual, dora being involved will change things. If one of the character tiles is dora, cutting 5s becomes more valuable, increasing our ability to accept another dora.

If you don't want to confirm a pair, the nakabukure tends to become bad. For example, changing that 7m to another 6m:

Cutting 3p is one more ukeire, but cutting 5s gets a three-sided wait on a 245p draw. Cut 5s.

Aryanmen

Aryanmen are like 4456. They're the worst of these shapes. As the saying goes, "If you're not sure what to discard, trim the aryanmen." Compared to the others, the chance of making a kanchan is the same as the chance of making a ryanmen. 3445 and 4456 both have two chances of making iipeikou, but the 3445 is ryanmen in both, while the 44566 shape is a bit sad.

Still, it's stronger than most other floating tiles, thanks to the iipeikou chance. Drawing another 4 for an entotsu wait or 7 when you need a pair is also valuable. It's not a bad shape, just worse than the others.

Even if trimming it ends up being wrong, it is usually only a minor mistake, not a major one.

Especially if you have good pairing shapes in your hand, or tiles you'd be willing to do a tanki wait on like honors or dora, trimming the aryanmen is strong. An honor tanki can have a higher winrate than the aryanmen shape.

Though, safety is also something to consider. If you have a dama tenpai with an aryanmen like 1123, then draw a dangerous tile, you can just cut the 1p and go to a tanki wait to keep tenpai. If you had a regular ryanmen wait, you'd have to break tenpai or push it. There's value in that.

Another thing is calling ability. You can call a 5 from 4456 with 46 and leave a 45 ryanmen. That can be easy to miss.

Six Blocks

Having six blocks in your hand can be good. It keeps your options open. But, your final hand can only have five blocks, so at some point you will have to say goodbye to one block. Usually, this happens when staying at six blocks would involve weakening one block, as you'd rather have five strong blocks, or when you want to drop a block to keep safe tiles or strong floating tiles like dora.

Reducing to Five

Choosing which block to discard to get down to 5 is usually straight-forward. Ryanmen > Kanchan > Penchan, or reduce to 2 pairs if you have 3. (3 pairs is good for hands you will call) But, how do we pick between ones of the same class if they are otherwise equivalent?

Obviously, if a dora is involved, you don't cut that block. We'll be assuming they are completely isolated first.

Ryanmen
If all your blocks are ryanmen, congratulations. You can go from 2 pairs to 1 in this case.

23 and 78 are "Class A ryanmen." They have the highest win rates. My data has them at 66% while fully live. However, they only get tanyao on half of their waits, and the terminal is more likely to be discarded.

34 and 67 are the next best, with a 60% win rate. They can accept the red five, and they fit into tanyao.

45 and 56 are the worst of the ryanmen. They have the lowest win rates at 58% and can't accept the red five. But, if they can accept the dora, they go up in value.

Kanchan
13 and 79 are the highest win rate. When fully live, they have a ~42% win rate, according to this post.

35, 46, and 57 all have two ways to upgrade into a ryanmen. However, they only have a ~31% win rate. Even when half-suji, it's only ~35%. If they don't upgrade, you might be troubled.

24 and 68 are in between. When fully live, they have a ~37% win rate. If you have value and are going straight to tenpai, they can be a bit better than the middle kanchans, but they're no better at making ryanmen than the 13 / 79, and the ryanmen they do make are worse. However, you will keep them over 13 / 79 kanchans if you can get tanyao.

One more consideration is whether the waits are suji. All the waits go up to ~50%+ win rate if they are suji, so value those highly.

Penchan
Well, nothing to really compare here. Check for sanshoku / ittsuu chances and whether their wait is suji, or if you can see any related tiles in the discards.

Complex Shapes
Largely the same rules as in the Four Blocks (with Pair) section. The closer the shapes are to a completed run, the better they are, and the closer they are to an incomplete shape, the worse they are. 13567 has a sanmenchan upgrade. 1356 can't upgrade immediately. 125 is competing for upgrades. 126 can upgrade to a ryankan.

Floating Tiles
If you have six blocks + a floating tile, a 3~7 floating tile is worth more than a penchan. Drop a penchan rather than remaining at six blocks.

Block Drop Order

Penchans
If the inner tile pairing up would get you tanyao, you should cut the outer tile first. Otherwise, cut the inner tile first, as the terminal is safer. The 2/8 can only upgrade to a furiten ryanmen or a kanchan. The kanchan would be better than another penchan, so if you do have two penchans in your hand, you could start from the outside, and then cut the other one if you draw the kanchan.

Kanchans
24 / 68: Cut from the outside, unless you wouldn't keep the block even after drawing a red five. If you know the red five isn't available, still cut from the outside if you have any blocks worse

than ryanmen. This includes overlapping ryanmen, like a 3467 elsewhere in the hand. If the remaining tile becomes a ryanmen, you can cut one of those and gain 4 tile acceptance.

For the others, whichever ryanmen you'd be happier making. In yakuhai hands, this generally means cutting from the inside. With a 35 kanchan, the 23 ryanmen is easier to call than the 56 ryanmen.

Ryanmen
The only particular consideration here is what happens when you draw the red five. With a 45 or 56 ryanmen, cutting the 5 means you can accept the red five and then cut a different ryanmen. Cutting the 4 or 6 means you make a pair upon drawing the red five. Whichever one of those is more desirable for your hand, cut in that order.

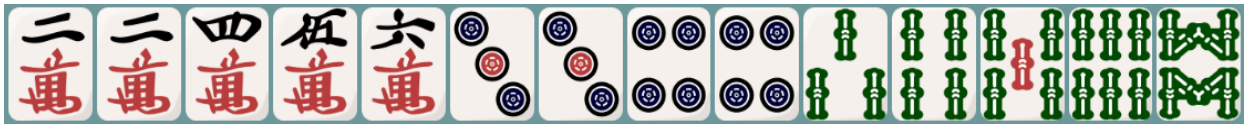
For other ryanmen, perhaps there is a situation where a tile pairing could give you sanshoku dokou. Outside of that, cutting from the inside for safety reasons is normal. With a 23 ryanmen, cutting 2 means you can make a 35 kanchan with the red five, if that's something you would accept.

Adjacent Pairs

Shapes like 3344 are surprisingly strong. They can be two pairs, two ryanmen, or trimmed to one block. When you have another pair in your hand, the rest of your hand dictates what you should do with this.

If the rest of your hand is ryanmen, cut one of them to go to a shape like 334. This can lead to a perfect iishanten. The 4 is more dangerous, so cut it first if there's no information.

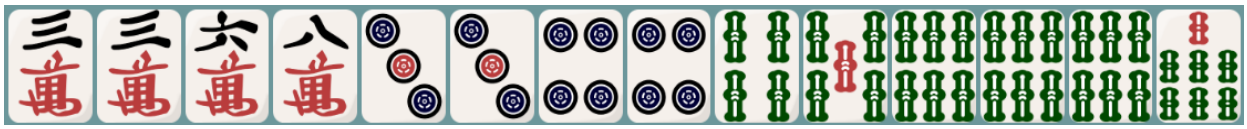
If the rest of your hand has bad shapes, you may cut the bad shape instead.



Cutting 3/4p is 16 ukeire. Only the 7s draw gives a good wait.
Cutting 8s is 14 ukeire. Drawing 25p gives a good wait and iipeikou chance.
So, cut the 8s. Trading two bad wait ukeire for four good wait ukeire is worth it.

If the pairs are at the edge, like 8899p, you can cut 8 for an aryanmen chance or 9 if it confirms tanyao. The value of iipeikou here is greatly diminished as it does not come with a good wait.

If there are more pairs or triplets, the value of this shape increases.



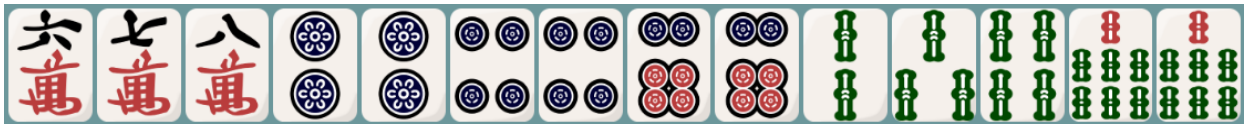
In this hand, cutting the bad shape is even more valuable. The difference is still 2 ukeire. Drawing 3m34p will give us a sanankou chance. 25p is a perfect iishanten for tanyao pinfu. If

any other tile pairs, it's a chiitoitsu iishanten. This fully shows their pair-pair vs ryanmen-ryanmen flexibility.

One-Gap Pairs

Shapes like 4466. These generally just get treated as two separate pairs. If all your other blocks are ryanmen, you'll cut one of these pairs. If you have a bad shape elsewhere, you'll cut that shape to keep the two pairs.

With three, like 224466, cutting the middle tile is usually correct. 22466 completes on any of 2356. However, there will sometimes be value in keeping it for the iipeikou chances.



Cutting 4p and 7s has the same ukeire. You can cut 7s for the iipeikou chance, and if the remaining 7s becomes a ryanmen, cut 4p at that point. However, if you plan to call, cutting 4p immediately is a better shape. There's no iipeikou in open hands.

Five Blocks

Trimming Shapes

As your hand progresses and blocks complete, you will run out of room for bulky shapes like 445. There are simple heuristics for choosing which one to trim down. You will generally not trim down like this while you have six blocks, unless you're confirming pinfu or keeping a safe tile, but there are some complex hands where all six blocks contribute to a yaku and you don't know which one yet, so you keep all six.

As for how to trim it down, it depends on the number of pairs in your hand. We generally want to keep two pairs, sometimes three if we're going to open the hand, but we can go down to one if it confirms pinfu or similar. For example, with a 355 shape, "trim" means cut the 3 when this is one of your pair candidates, and cut the 5 if there are enough pair candidates elsewhere.

Trim the strongest shapes first

Between 334 and 355, cut the 3 from 334. It's a stronger shape, it doesn't need as much help. An exception is if these are the only two pair candidates in your hand. We want to keep two pairs for maximum acceptance, so in that case, we would cut 3 from 355 to leave the strongest 5 shapes possible.

Nearby tiles can also strengthen the shapes. For example, if it was 345668p244s. The 668p and 244s shapes on their own are equivalent, but the 345p is strengthening the 668p. So, we trim from 668p, making either the flexible 34566, or the easily upgradeable 34568.

In callable hands, keep the easier to call shapes

Imagine your choice is between 112 and 355. The 1 is easier to call, so trim the 355 shape.

In closed hands, prefer upgrade potential

The same choice as above, 112 vs 355. The 355 could upgrade to a 556, so trim the 112 shape.

Keep yaku in mind, especially tanyao

Between 788 and 334, cutting the 3 results in more tiles that confirm tanyao. But, 78 is a stronger final wait, so if there's no tanyao chance you can cut the 8 instead. If these are your only two pair candidates, cutting the 7 confirms tanyao. Cutting 4 leaves the stronger final wait option open, at the cost of red dora acceptance.

With 112m vs 122p, if the rest of your hand is tanyao, you can cut the 1 from 122p. Then, if you draw 2m or 4m, you can drop the 11m pair for tanyao. If there's no chance of getting tanyao, you can cut 2m as a sakigiri trap, or 1m / 1p depending on how the discards look.

Ryankan

Shapes like 246, you can trim down by either cutting the 2 or 6. Assuming both resulting kanchans have the same number of live tiles, cutting the 6 makes the 3 wait a suji trap, but cutting the 2 leaves red five acceptance and ryanmen transformations. In this situation, cutting 2 is preferred.

If they have an extra tile like 2466m, then you would reduce to a ryankan by cutting 6 if the rest of your hand is pinfu and you have another pair. If there's something preventing pinfu, trimming down to 466m is often better. Say your other pair is 77p, then drawing the 7m, 6p, or 8p can move you to a perfect iishanten.

Reducing to Four

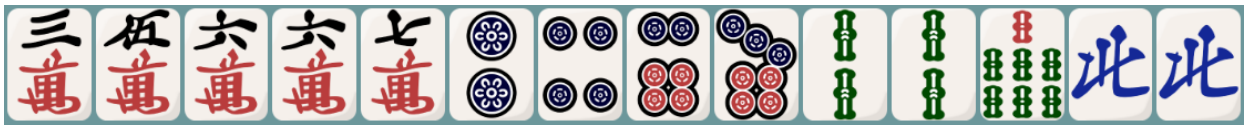
鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

There are times when it's better to cut a bad shape, like a penchan or kanchan, from your hand even when you only have five blocks. This is especially worthwhile if it ends up getting you tanyao. Cutting a bad shape costs two turns. Being able to call with tanyao can make up for that slow down.

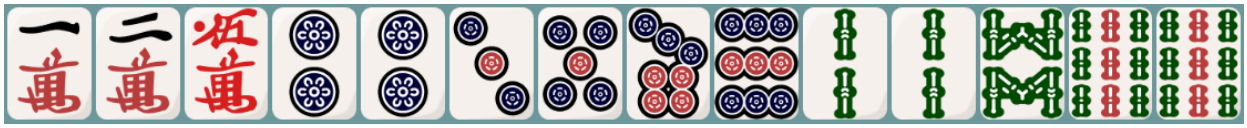
The following should be true to do this:

1. Your existing blocks are likely to result in a bad wait riichi nomi.
2. Doing so can get you +1 han and maybe more.
3. You're currently 2-shanten or worse.

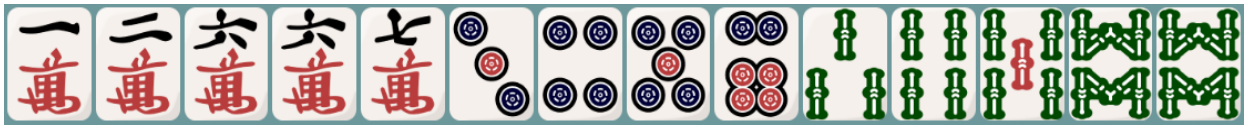
Here are a few example hands from the book.



Dora is green dragon. This is a riichi nomi hand. You can cut the norths and aim for tanyao, with the possibility of pinfu, iipeikou, or sanshoku. If something like 7p was dora, it wouldn't be a nomi, and 3m would be a more balanced discard.



Dora is 5m. We would really like to have the +2 han from the double dora rather than a riichi nomi hand, and it could improve our wait, so cut 12m. It would still be worth it if the five wasn't red. If it was just a normal five, it wouldn't be worth it.



Dora is 4s. This hand doesn't fulfill the rules, as it's 1-shanten and not a nomi. However, the shapes are so good that cutting the 1m is still worth it for the good wait + tanyao + pinfu chances. Shapes like 5667 or 3456 increase the value of dropping bad blocks.

Ryanmen Kanchan

Shapes like 455679. These are easy to overlook, so take care with them. This one in particular makes two runs with a 3/6/8 draw. The 9 is adding four ukeire in the 8 draw.
45 + 5679 -> Ryanmen + Run, 3 and 6
456 + 579 -> Run + Ryankan, 6 and 8

Unlike a normal ryankan, this can always give pinfu, since cutting the 9 leaves a ryanmen.

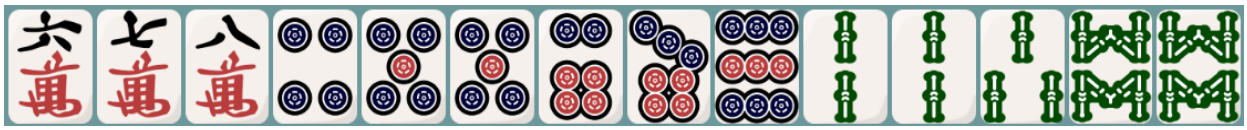
Keep an eye out for times you can create this shape. They hide from you well.

This looks like bamboo has two ryanmen and a completed run. However, we can cut 2s to make a ryanmen kanchan. This is 3 more ukeire compared to cutting from any of the other ryanmen, such as 7s.

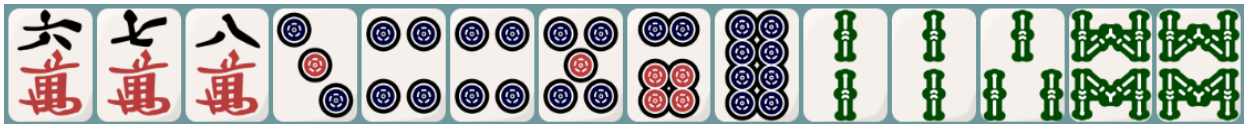
If the extra tile is moved from 2 to 5, it gets complicated.

You can cut 5s to make a ryanmen kanchan, same as before. However, you can also cut 3s and have iipeikou chances. The ukeire is the same either way. Cutting 3s and drawing 6s leads to the most expensive hand, but if you draw 5s or 1p, you lose pinfu. Cutting 5s can't give iipeikou, but always gives pinfu. Generally, cutting 3s is the better choice, but cutting 5s will be good if you don't want to call riichi due to the situation at hand, as it guarantees a dama-able hand.

Since the kanchan tile is adding +4, it's adding the same as the overlapping tile in a perfect iishanten. Choosing between them in equal situations comes down to yaku chances.



Cutting 9p and 2s gives the same ukeire, both removing 4 tiles of acceptance. 2s raises our chance of pinfu, 9p raises our chance of tanyao. Tanyao is better than pinfu (+10 fu), so we cut 9p here.



Now we have the same tanyao chances either way. We can cut 2s for pinfu in a closed hand, or cut 8p so we can pon into a tanyao tenpai.

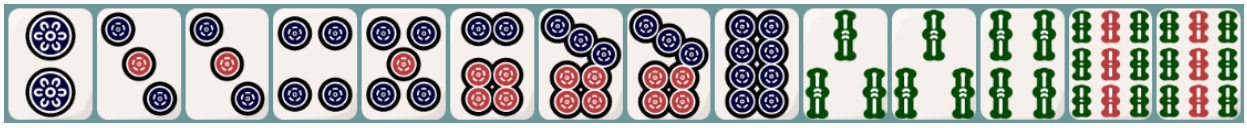
Wing Shapes

Wing shapes are rare, but easy to recognize visually. Fortunately, the usual "don't touch the complicated shapes if you're unsure" works with these just fine.

The first is 233456778, a nine tile wing. This is sort of two ryanmen kanchan together.

233457 + 678, 146 acceptance
234 + 356778, 469 acceptance

These are very good shapes that can always give pinfu when you have a pair. You should generally not touch them, even if they're against the edge.



A nine-tile wing. Don't touch it. Cut the 3s and all outs are pinfu.

Two nakabukure make an eight tile wing shape, 23345667. These always give pinfu when you have no pair and have many ways to give iipeikou if you do. If the rest of your hand is 123778, cutting 7 guarantees a hand you can dama, while cutting 8 is better for points due to iipeikou.

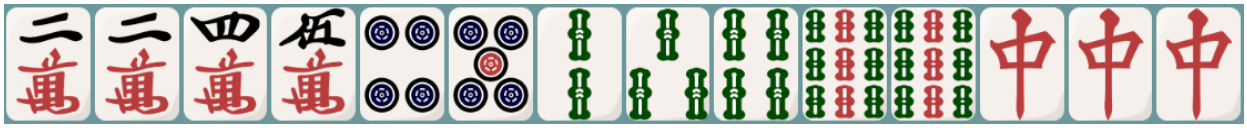
This shape is called a “Super Perfect Iishanten.” If perfect iishanten is so good why is there no–

One tile closer gives 3445667. Similarly good at giving iipeikou. But, the 1/9 draws here give a bad wait tenpai when you don’t have a pair.

Open Hands

It’s been alluded to a few times earlier in the section, but with open hands, you prioritize the blocks that are easier to call. Typically, that means further from the middle, but players doing flushy things can change it. Particularly what your kamicha is doing.

In closed hands, 2 pairs is the strongest, but in open hands you like keeping 3 pairs when 2-shanten or worse. That way, if you call pon you’re at 2 pairs. 1-shanten is largely the same as closed hands, but there are some unusual decisions sometimes.

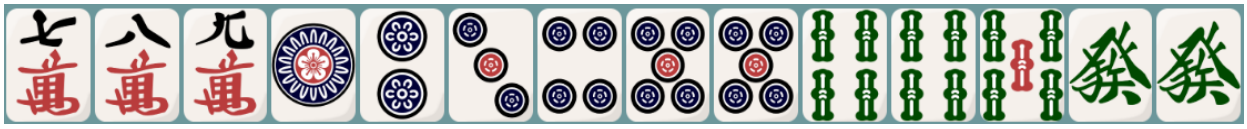


The red dragons have been called. In a closed hand, you would cut one of the pairs and leave two ryanmen. 16 ukeire, all good waits. In an open hand, you cut the 5m. 16 ukeire, only 8 of it gives a good wait. But, this way, you can call pon and end on a good wait. And the 2m9s are easy to call.

There’s a saying, “Chii is two times faster, pon is four times faster.” With chii, you have your draws and your kamicha’s discards. With pon, you have your draws and everyone’s discards.

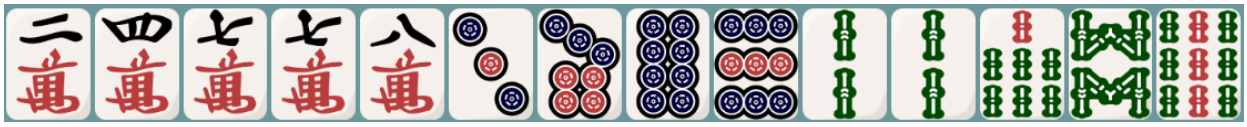
If the 45m was 56m instead, it’s only 12 ukeire, so you would just cut 2m. Or if the 99s was a 77s, your ability to call pon is reduced compared to the terminal pair, so you can cut 7s. (2m is easier to call, so you leave that pair in case you draw 45m45p)

Atozuke is a time you’d want to keep three pairs at 1-shanten.



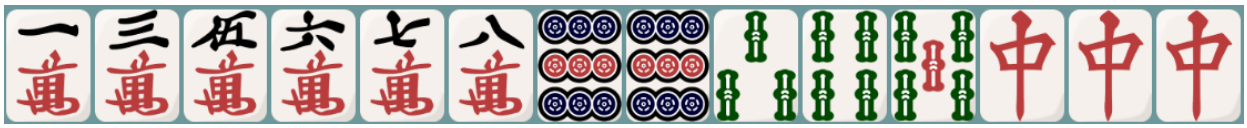
Imagine the 789m has been called. Cutting 4s gets you to a perfect iishanten. (5p does too, but 4s is better for red five acceptance) However, it’s a bit pointless, since the 356p ukeire leaves you without a yaku. So, you’d confirm a pair by cutting 1p (or 4p5s). Then, if you get tenpai without the green dragons, you can still do a shanpon to keep your yaku chances.

Here’s another atozuke consideration:



789s has been called. Our choice is between 7m and 3p. We need the 9m to have a yaku, so the added ukeire from 7m isn't doing anything, and it has one less ryanmen upgrade chance compared to the 3p due to the 8m in our hand. But, if we cut 7m, then draw 6m, our chances of furiten are high. This 7m is furiten insurance. If we leave it, then draw 6m, we can make it a ryanmen instead of discarding it and risking furiten. So, cut 3p.

Because of the ability to chii, you will usually keep bad shapes like penchans over floating tiles. If you squint, it's like their ukeire is doubled. Nakabukure and yonrenkei are still very strong though, giving you 4 ways to chii, so those still justify dropping a bad shape. Chii also makes our tenpai decisions different:



In a closed hand, we would riichi on 5m. With the chun pon, we would cut 1m. The 4m is a worse wait, but we can call 679m to turn it into a ryanmen. See also Kuinobashi.

Dora is 3m. In a closed hand, we would riichi on 2m to give the minimum amount of information. With an open hand, we cut 5m. That way, we can chii the dora 3m (with 24m, cutting 6m) or the red five (with 46m, cutting 2m) and get +1 han. See also Calling Only For Yaku.

Seven Pairs (Chiitoitsu)

Also 実戦でよく出る！読むだけで勝てる麻雀講義 - Yuusee's Mahjong Lectures

According to the principles, we value speed of winning over immediate ukeire. Leaving chiitoitsu on the table can make our ukeire much higher, but it's guaranteed a tanki wait, and a chiitoitsu 1-shanten is only 9 ukeire at best. So, when we have a good chance for a normal hand, the normal hand is often better.

2-shanten vs 2-shanten
This means a hand with 4 pairs. Often you can balance these with minimal losses, but if the pairs are starting to get in the way, it's time to decide which path you're taking. You can keep chiitoitsu in any of these situations:

1. There are no completed runs, and 1 or 0 good blocks
2. You have a pair with a red five included
3. A normal hand will be too cheap for the point situation

4. You're not bothered by the chance of needing to pay noten payments

You can use the same criteria at 3-shanten, but there's usually no cost to leaving both paths open at 3-shanten.

A ryanmen-ryanmen 1-shanten takes 8 turns on average to reach tenpai. A chiitoitsu 1-shanten takes 14 turns on average to reach tenpai. And, the normal hand can call to reach tenpai even without a yaku when the end of the round is approaching, which chiitoitsu can't do. Your chance of being noten is much higher if you go for it. If this could make you drop placements, the value of chiitoitsu goes down a lot.

Chiitoitsu 1-shanten vs Normal 2-shanten
You should usually leave the possibility for chiitoitsu open in this case, unless the normal hand is callable (e.g. tanyao, or yakuhai pairs). Keep floating tiles that give strong tanki waits over tiles that give you normal hand upgrades. For middle tiles, prioritize keeping fives, as they can make pairs with the red.

1-shanten vs 1-shanten
When you're 1-shanten for both types of hand, often you have an iipeikou or iipeikou chance.

If choosing the normal hand would result in a 2x bad shape 1-shanten, prioritize chiitoitsu. The ukeire is similar (8~12 vs 9) and the +2 han is valuable. Plus, a good tanki can have a better win rate than a kanchan or penchan.

If choosing the normal hand can end in a ryanmen tenpai, prioritize the normal hand if it's better than nomi. If it's guaranteed to end in a ryanmen tenpai or better, going for the normal hand is often better. Exceptions include ryanpeikou chances or guest wind dora tankis being possible.

If you're choosing a normal hand, choose it fully. Go back in chiitoitsu shanten and commit.

Prioritizing normal hand by cutting 4s: 79m158p ukeire, 15 tiles.
Keeping both possible by cutting 8m: 9m158p56s ukeire, 17 tiles.

However, six of the ukeire after cutting 8m is a tanki (currently quite a bad tanki). Abandon chiitoitsu for more good wait outs.

Chiitoitsu 1-shanten vs Toitoi
If you have a chiitoitsu 1-shanten that includes a triplet, most of the time you should keep the triplet around. Being able to call is a big advantage. You will trim the triplet down to a pair if:

1. One of the pairs in your hand is dead (you can see the other two tiles), or

2. You have a floating dora you can tanki on, and an open toitoi would be toitoi nomi, which makes the point difference quite large (6400 vs 2600)

If it has two triplets and four pairs, turning both into pairs will get you to chiitoitsu tenpai. But, you're also 1-shanten for toitoi, sanankou, or even suuankou. If you have a dora pair, or two of your pairs are dead, you can go for chiitoitsu, but in almost every other situation, you'll keep the triplets and drop a pair.

Wait Selection
There are some unexpected results when balancing win rate and win value.

If the hand is chiitoitsu nomi, the winrate of a non-suji 3~7 dora tanki is low enough that you would rather tanki on a terminal or honor: Non-suji 1/9 = Non-suji 2/8 dora > Non-suji 3~7 dora

If it could be tanyao, even though the number tiles give you tanyao, when they're non-suji the winrate of them is so much lower than an honor tanki that the EV goes towards the honor. This is also the case for a non-suji 1/9 when compared to a non-suji 456, but a non-suji 2378 is better than the terminal. So:
Honor > Non-suji number; Non-suji 19 > Non-suji 456

See also: Dama for Upgrades

Sakigiri

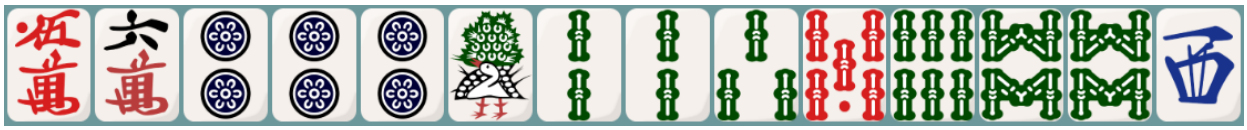
令和版 現代麻雀技術論 - Modern Mahjong Strategy

Sakigiri is slimming your hand in order to keep a safe tile. For example, you have a 455 shape and draw the twice-cut west wind. You can cut the 5 and hold the west wind to buy you a turn if someone calls riichi. In normal situations, you should only do this in the mid-game. Before turn 8, the chance of other people getting tenpai is relatively low and you should just be focused on reaching it yourself. As you start getting into the second row, it can be worthwhile if your hand isn't very good. If you're fourth place, the merit of sakigiri also goes down a lot.

Floating Tiles with Upgrades vs Safe Tiles

These are the easiest tiles to justify doing sakigiri with, as they're likely only around for upgrade potential. It's usually worth doing this in mid-game, unless the floating tile is important, such as a dora when you have no value, or a tile that allows you to call.

- If you would fold your hand against a riichi upon drawing a non-suji tile, keep any tiles that could upgrade your hand into a fighting hand, and otherwise keep a safe tile (e.g. a floating tile that gives you sanshoku if it connects the right way should be kept)
- If you would push your hand against a riichi, keep any tiles that help you win faster



- If any of the middle tiles are dora, it would be an open mangan. The 2s is giving us a path to tanyao. Leave it and cut the west.
- If it's just dora 2 or less, calling reduces our value, so the transformation is less valuable. Cut 2s and keep safety.
- You can also leave the 2s if you have bad shapes, even with dora 2 or less.

From 場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull:

I thought this advanced example was really instructive. It's turn 7 and the dora is 6m. Yoteru says:

- This is a riichi dora 1. Getting one more han would give us a good chance of mangan, so keeping the 6s is valuable for iipeikou. Cut the green dragon.
- However, in the game we can see one 5s in the discards. Iipeikou is much harder now. Even if we drew 4s we would cut 2s and then likely choose to end on a 3s kanchan. The 2p2s shanpon is also fairly good as far as bad waits go, so we don't have to be desperate for a ryanmen. Cut 6s.

Tiles with Ukeire vs Safe Tiles

If your hand is worth fighting for, you should not sakigiri. In a perfect iishanten, there are 20 tiles that get you to tenpai. If you sakigiri, that's reduced to 16. One in every five times you do it, you'll end up missing tenpai. You really want to win your strong hands, so keep all the efficiency you can. Even if someone calls riichi, a 3 han perfect iishanten is usually worth pushing with.

Keeping safe tiles at the cost of ukeire with strong hands is a bad habit.

Outside of strong hands, the fundamental strategy is still to not sacrifice ukeire, unless the tile is particularly dangerous. For example, someone is going for a flush, and you have a 566 shape in the same suit. Cutting the 6 is most worth it there. But, if you have a hand worth pushing, the loss of speed from cutting the 6 isn't worth the small deal-in chance reduction.

Times you'll do this are mainly…

- It's midgame, and you're still 2-shanten or worse
- If someone called riichi, you wouldn't instantly fold, but would try to maintain potential

Though, look at your opponents' discard pools. If you already have safe tiles for each player, you often don't need to sakigiri anything.

場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull
In this book, yoteru says that if you have (at minimum) one completely safe tile and one mostly safe tile for each player, you don't need to sakigiri. Mostly safe tiles include things like nakasuji, suji terminals, and other safety gathered from reading. He also mentions that if someone looks slow, you don't need safe tiles for them to justify not doing sakigiri, adding that if someone looks slow and calls riichi, they have a lot of live suji, so the deal-in chance of any given tile is low anyway.

When Your Hand Is Really Bad Early Game (4-shanten+)

You have three options here.

1. You basically fold from the start and hoard safe tiles. (sakigiri early game)

When you can't even see a path to value, you can choose this option. But, keep your blocks, just in case you have a series of amazing draws. A 4-shanten hand can still get tenpai in 4 draws.

2. You play normally, then keep safe tiles later if it doesn't pan out (sakigiri mid-game)

Hands with lots of dora, or possible expensive yaku, should choose this. You still want to chase the slim chance of making these hands. If you reach the midgame, and your hand is still in a state where you would fold, keep safe tiles as discussed before.

3. You play normally all the way up until someone tells you they're tenpai (never sakigiri)

Kokushi, chiitoitsu, and honitsu hands should choose this. You don't need to think about safety, because your hand naturally has safety in it through the honors you're keeping around. This is also the default option when you're in fourth place.

鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

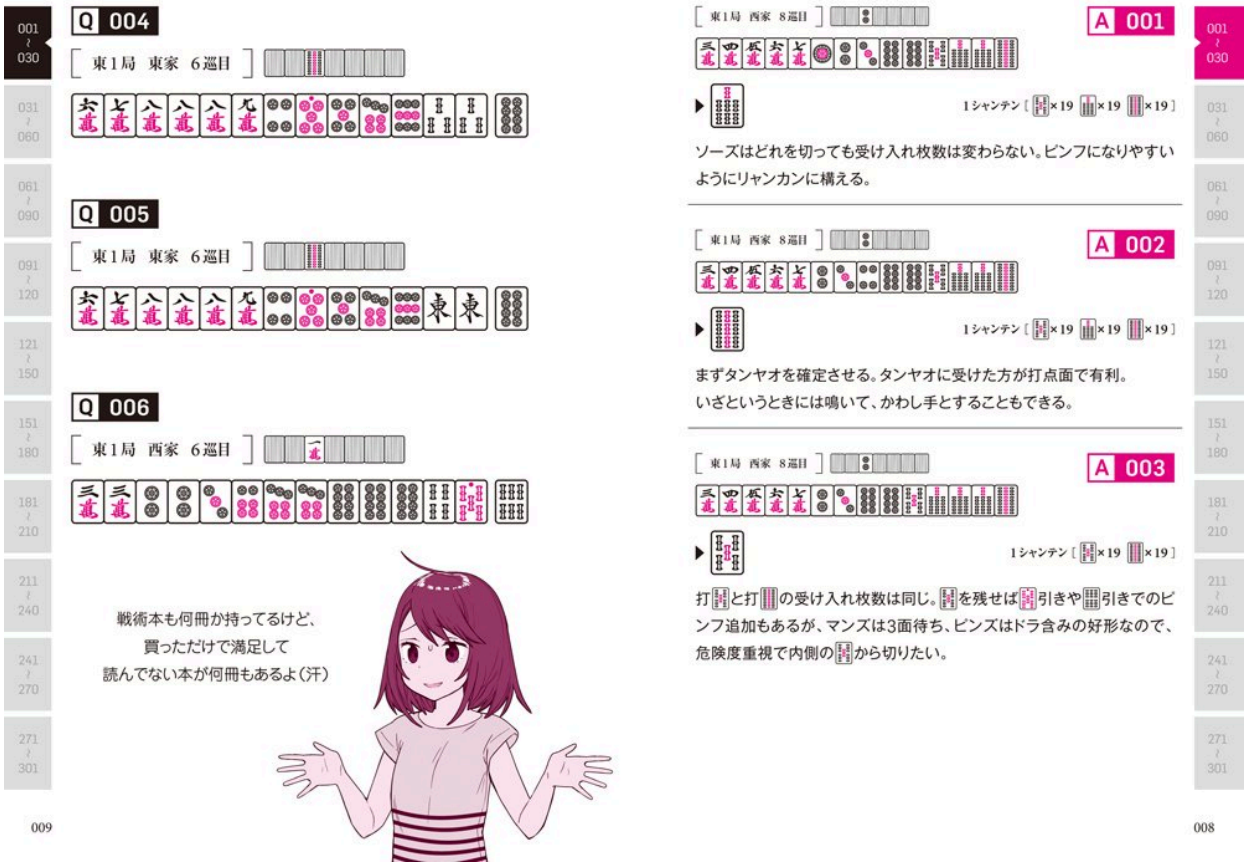
Tiles that are easy to sakigiri:
- Terminals, even when you lack blocks
- Tiles that are just around to upgrade into a good wait
- Tiles that are just around to upgrade into more value, when you already have good value (3+ han)
- Tiles like the 5 in 455, supporting good shapes
- 6th blocks

Tiles that are hard to sakigiri:
- 3~7 tiles when you don't yet have 5 blocks
- Tiles in 3456 or 3445 or similar shapes when you still have bad blocks

- Tiles that are just around to upgrade into more value, when you lack value (1-2 han)
- Tiles like the 5 in 355, supporting bad shapes
- Tiles like the 3 in 334 when you have an high value, callable hand (enabling pon)

Further Reading

Some of Uzaku's WWYD books could be used to practice your efficiency even if you don't know Japanese. They're laid out like this:



You have questions and answers, even if you can't read the explanations. Maybe you can figure it out yourself, maybe you can ask in the Discord for help, maybe a robot can translate for you. The girls below the questions are just yapping, they rarely say anything relevant.

In the page above, the answers on the right are "cut 7s for pinfu," "cut 9s for tanyao (10 fu more than pinfu and callable)," and "cut 5s even though it lets us get the red five; drawing 6 for pinfu is less appealing because our other shapes are a sanmenchan and dora ryanmen; the 9s is a much safer tile. (it's turn 8)" The girl is saying, "I have a lot of (mahjong) strategy books, but I get satisfied just buying them, I have a bunch I still haven't read. 😅"

If you only get one, I'd recommend 麻雀 定石「何切る」301選, but I haven't read the newer ones.

Calling

令和版 現代麻雀技術論 - Modern Mahjong Strategy

Calling is perhaps the most stylistic part of mahjong. In Houou, the common call rate range is from 25% to 44%, but there are outliers all the way to 13% and 68%. For Tenhoui, they are generally around 30~40%. See also the AI Replay Reviews section.

But, the percentage doesn't tell the whole story. You could have a 35% call rate, but 10% of that could be from bad calls, while you're missing the good calls in 1/10 rounds. Most likely, around 20% of calls are "must call" no matter your playstyle, while around 30~40% are "must not call." The space in between is hard to distinguish.

In this section, I will describe a relatively call-heavy playstyle. If you follow everything here, you will end up with a call rate just below 40% or so. This is a digital style built on data and simulations. You can think of it as the upper limit of what constitutes a "good call." Adjust to taste. If you call much more than this, the calls might be sketchy, but there's quite a bit of room to adjust downward.

Also, everything here assumes you have a yaku, of course.

From 1-Shanten

Using a closed perfect iishanten as the baseline, you can call to take tenpai starting at **turn 8**. The round is getting later, other players will be reaching tenpai soon, you're running out of time.

Now, with the baseline at turn 8, there are many things that can push it earlier or later. All of these stack with each other.

Times You Delay Calling

Basically, the higher your chances of reaching tenpai while closed, and the more points your hand is worth when closed compared to open, the longer you should wait until calling it.

- If your 1-shanten is even better than a perfect iishanten, wait two extra turns before opening it.
- Calling from a sanmenchan should be delayed two turns. E.g., if you have a ryanmen and a sanmenchan, you can call the ryanmen two turns earlier than you can call the sanmenchan.
- For each han you lose when calling, add two turns. If you lose pinfu when opening, that's +2 turns, if you lose pinfu and you have a sanshoku or iipeikou, that's +4 turns.

- If the call leaves you with an unconfirmed yaku, for example the call leaves a 23 ryanmen that can only win on the 4 for tanyao, then add four turns.

- If the call changes you into a bad wait, also add four turns. For example, a perfect tanyao iishanten with 223m56p44s. Calling the 56p, you could cut 3m for a tanyao shanpon, which is much worse than a ryanmen. This is basically another flavour of unconfirmed yaku. This also includes calling a ryanmen-ryanmen headless iishanten, where it makes your wait a tanki instead of a ryanmen.

There's technically an upper limit to how late you can push your calls, as once you get around 3~4 turns from the end of the game, you'll want to be calling for keiten anyway.

Times You Call Earlier

The reverse of the above. The lower your chances of getting tenpai while closed, or the more points your hand is worth open, the earlier you should call the hand.

- If your 1-shanten is worse than perfect, such as two ryanmen, call two turns earlier. If there are bad shapes, call those at any point. Each tile the bad shape loses makes it much worse.
    - However, if calling lowers your hand from 3 han to 1 han, or 4 to 2, you can skip the first tile in your bad shape early. The second tile is too hard to skip, just call it. A kanchan with two outs missing is awful.

- If the shape you're calling is one of two overlapping ryanmen, such as 3467, call it two turns earlier. You can sorta see it as a good shape + bad shape if you squint (12 acceptance, same as 34m57p).

- If your hand is 3 han open, call two turns earlier. If it's 4 han, call at any point. A mangan is plenty. You can factor the sticks on the table into this. If there are 2 riichi sticks up for grabs, any open hand is basically 3 han. Even a 1 han hand will give you 3300 points.

- If you're the dealer, call two turns earlier. These hands are 1.5x more expensive and a repeat has value too.

- If the call confirms tanyao, like calling 4 with a 23, do it two turns earlier. Future calls get a bit harder if you skip these.

These can stack up to make calling good very early on. For example, a 2x ryanmen hand with a dora pair as dealer, and no pinfu chance. The baseline is 8, but the shape is worse than perfect, so 6, and we're dealer, so 4, and we have three han, so we can call to tenpai from turn 2, crazy as it sounds.

From 2-Shanten

You can call from a closed 2-shanten hand two turns earlier than the equivalent 1-shanten hand. Mostly, refer to that section. There are just a few points to be aware of.

First, the case where you have 6 blocks. If you have 6 blocks, you don't need to be in a hurry to call your bad shapes, since you might just end up cutting them anyway, and there's lots of ways to complete shapes in your hand. So, add 2 turns to your minimum calling turn in this case.

Second, don't call pon or ryanmen into a headless 1-shanten. In other words, don't call if you'll have no pair, unless removing bad shapes. If you don't have a pair, you also shouldn't call shapes like 23457 that are good at making pairs, even if it's the 6 you can call. Chii lets you complete runs easier, but creating pairs is hard when open. Each time you chii you're removing at least two pair candidates from your hand.

Finally, you can call from 2-shanten at any point if your hand is worth 3 han, as long as you're not making your hand notably worse by doing so, like breaking good shapes or removing yaku. This matches ASAPIN's "Dora Dora Dash," where he says any hand with 2 dora should be called whenever possible.

From 3-Shanten+

To call while in 3-shanten or worse, you should fulfill two of these criteria:

- Good shapes after calling
- Dealer
- 3+ han
- Safe tiles

If you have one or fewer, wait until your hand progresses to 2-shanten while closed before thinking about calling. There are two yaku that fulfill this rather easily, toitoi and honitsu.

Toitoi Dash

ゼロ秒思考の麻雀 - Mahjong with Zero Seconds of Thought

Toitoi Dash is a term coined by zeRo. The conditions to commit to a toitoi dash are as follows:

- You have at least 4 pairs
- 3 of those pairs are easy to call (1/2/8/9/honor)
- At least 3 han (yakuhai, dora pair, pair with red five, etc)
- A normal hand is slow

This will generally fulfill the requirement for the 3-shanten calls, too. You have 3 han, and one or more of the pairs will often be safe. It's a result of the rules rather than an exception.

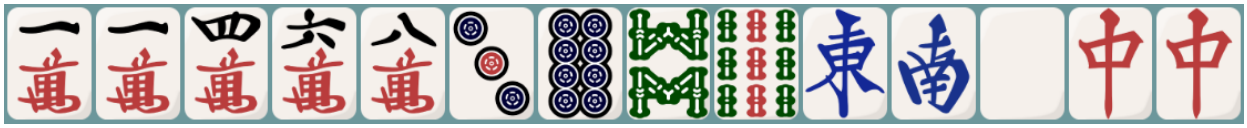
When these conditions are fulfilled, trim the middle tiles from your hand and start calling pon on everything. Keeping easily callable floating tiles like honors will also increase your safety.

Honitsu

In the same book, zeRo calls honitsu an imbalanced yaku. He suggests considering honitsu any time you have a yakuhai pair in your hand. This also fulfills our 3-shanten calling criteria. Honitsu + Yakuhai will be 3 han, so that's covered, and while going for it, you'll be hoarding honor tiles, so you'll also have plenty of safety.

Riichi Book 1 suggests going for honitsu when you can see 5 blocks for it, but you can really do it with much less than that. You can chii to widen your hand, or just rely on drawing some tiles. Your main considerations are whether your hand has value without honitsu, and whether your hand has any good shapes in the other suits. The question is basically, "Would this hand be any good without honitsu?"

In this Senba book, she suggests going for a characters honitsu with the following hand, in East 1 with 9m being dora, by cutting 8p first. There's really only 3, maybe 4 blocks for honitsu here.



The reasoning is that this hand isn't going to be anything if we go straight to tenpai, and it's also very slow. **"Rather than a 1 in 10 chance of 1300 points, aim for the 1 in 20 chance of a mangan."** If we draw 4p or 7s, we can think about a normal hand again.

Here's a hand from a Yuusee (Celestial, peak 10d Tenhou) stream, in East 3 with West being dora.

We have a yakuhai pair, so we can go for a characters flush. The 68p isn't a good block, we won't be sad to drop it.

We're still 2-shanten, but our hand is full of safe tiles. Even if someone calls riichi, we won't be troubled at all, we can fold easily.

Atozuke

Atozuke refers to calling while you have no confirmed yaku. Specifically, we'll be discussing yakuhai atozuke here. This is calling other shapes while you have a pair of yakuhai tiles. There are some simple rules for this, which tie into our 3-shanten calling requirements.

1. Call bad shapes whenever.
2. Don't call good shapes until late in the round.

That's it. By doing this, we maintain the "good shapes" criteria for calling, and the yakuhai pair itself fulfills the "safe tiles" requirement. As for calling the yakuhai itself…

Yakuhai Pons

Now, this is the big divergence point. Do you call pon with a yakuhai pair when your hand is bad?

By the criteria above, we should not. This is also stated in multiple books. Don't call a yakuhai pon if your hand is slow and valueless. Keep the two safe tiles to defend with.

However, many Tenhoui players will do it. They will call pon on yakuhai with basically any hand if it's in the first few turns. The reasoning is that the hand becomes extremely hard to win if you don't call pon, and if your hand ends up not progressing, you can just hoard safe tiles then. Though, keep in mind that Tenhoui have extremely good reading and defense abilities.

This is a matter of taste in the end. Do what feels right to you.

However, after the first few turns, the danger increases. If you're near the end of the first row and still 3-shanten, you should likely skip if you have no other safety. When 2- or 1-shanten, you can basically view the yakuhai pair as a bad shape (if it's not your only pair) and call accordingly.

Another Perspective

鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

In this book, お知らせ expresses the following opinion:

- Hands with 1 or 2 dora are better as riichi hands
- Hands with 0 or 3 dora are better as open hands

お知らせ is one of the lower call-rate Tenhoui, at around 30%. His logic is that, with 1 or 2 dora, riichi has a good chance of getting you to a mangan hand, with tsumo and/or ura dora. 3 dora is already a mangan when opened, and 0 dora doesn't have a high return with riichi so you might as well call with it.

This goes against ASAPIN's "Dora Dora Dash," which says you should call as soon as possible with two dora, but both players reached Tenhoui.

Kuinobashi

Kuinobashi is calling a tile not to progress your hand, but to widen your acceptance, often at tenpai. There are lots of shapes that can do this:

23457: Call 134 with 23 / 45, cut 7, wait on 3-6. Run + kanchan
23446: Call 3 with 24, cut 6, wait on 2-5. Run + overlapping kanchan
24678: Call 5 with 46, cut 2, wait on 6-9. Run + separated kanchan
23455: Call 1346 with 23 / 45, cut 5, wait on 3-6. Run + adjacent shanpon
23334: Call 1245 with 23 / 34, cut 3, wait on 1-4 / 2-5. Run + overlapping shanpon

Basically, if you have a bad wait, and that wait is near a completed run, there might be some calls you can do to widen it. At 1-shanten, there's a huge number of these, so I won't list them all. 3456, 3445, and 3345 (call 4 with 35) shapes are easy candidates for making an extra ryanmen.

Kans

There are many different opinions regarding kans. I think you can mostly follow your heart.

A closed kan of terminals or honors is basically worth a han. 1 han 60 fu and 2 han 30 fu are the same points. These are usually worth doing when below 4 han.

An open kan from the player to your left has low value. You'll be getting another draw immediately anyway. However, an open kan from the player to your right will skip two players' turns and basically go straight to your draw, so it can be worth doing if you're at tenpai or close to it and your hand is already open.

The strong player zeRo also suggests doing added kans when your hand is bad, since your ukeire is so wide the chance of the tile being useful to you is high. That one's pretty controversial I think.

A good general guideline is to do them when you have reason to believe your chance of winning the round is the highest of all the players. If you're tenpai with a ryanmen or better, in most cases you will be, at worst, tied with someone. Even if you and an opponent are both in riichi, you could do the kan. Especially if the kan tile isn't safe against the enemy. Similar for a fast 1-shanten when nobody is showing tenpai, or even a fast 2-shanten early.

Calls Against Riichi

There are various calls you can do when facing a riichi that can be advantageous to you in one way or another, even if they're not helping your hand, and even if you're folding.

Haitei Shift

If you call a tile, you can change who gets the final draw. There are two times you'd want to do this.

First, you can move the last tile away from the riichi player. This will prevent them from getting a haitei tsumo, reducing the amount of points you have to pay. This often has merit in the last few turns.

Second, you can move the last tile to the riichi player. This is done when your enemy is the dealer. You try to give the riichi player a bigger tsumo, so your enemy has to pay out a bigger dealer penalty. You might do this when the riichi player is so far ahead that you're just playing for second, for example.

Make sure you have enough safe tiles to last you to the end of the round when doing this. Especially if your call moved the final tile to yourself, you don't want to deal in with houtei.

To know who has the final draw, look at the count of tiles left in the wall. Whoever's turn it is when that's a multiple of four has the last draw. Any call, except an open kan from the player to your left, will change it.

Turn Skipping

With certain shapes, you can skip your own turn. For example, with a 123456 shape, you can call 4/7 with 56 and cut 1. You stay as you were (eg in tenpai) and avoid drawing a tile, which could be dangerous. It buys you another turn, at the cost of a bit of future safety. You can also do this to accept dora, tanyao, sanshoku, etc. If the 4/7 is dora, don't turn calls off, you can still call to add a han to your hand.

Jamapon

The "jama" comes from 邪魔, meaning "hindrance, nuisance, obstruction, etc." A jamapon is a pon you do to disrupt another player.

If the riichi player is to your left, calling pon from the player across from you will skip the riichi player's turn. This is generally not worth doing on its own, as it removes two safe tiles from your hand, but if the round is nearly over it can be a consideration, and has the simultaneous effect of shifting the haitei tile.

Another time you might do this is if the kamicha of a flush player just cut a tile in the flush suit. You can call pon on it to prevent the flush player from calling chii. If the tile came out from a different player, you being able to pon it means the flush player cannot possibly pon it. There are only 4 of each tile.

Ippatsu Breaks

一発消しをした後に起こること - Things that can happen after you break ippatsu

If you call anything, you remove ippatsu as a possibility. But, this is generally bad to do if that's your only reason for the call.

If someone gets ippatsu, it doesn't meaningfully change their points if it raises them from 4 to 5, or 5 to 6 han. So, in some cases, removing ippatsu won't even be changing anything. And with a ryanmen wait, there's only a 1/17 chance that situation even comes to pass. The call is quite low value. On average, we could generously say the call saves you maybe 100 points.

But, if the call leaves you without a yaku, the cost of no longer being able to win is real. Even if your intention is to fully fold, you could still randomly draw into a tenpai. On top of that, making a call increases your rate of dealing in while trying to fold by around 1~2% on average, which comes at a cost of around 100 EV. That alone erases the benefit of calling to remove ippatsu. Not to mention the chance someone else chases the riichi.

Thus, the cases where you would actually want to break ippatsu are:

1. It's South 4, and the riichi player needs a high value hand to raise their placement. A riichi tsumo is 500/1000, so if they need any higher than that, removing ippatsu can remove a way for them to succeed
2. The riichi was quite late, you have enough safe tiles to last until the end, and the call won't give the riichi player the final draw

Bluffs

麻雀勝ち組の鳴きテクニック - The Calling Techniques of Winners

Bluff calls are calls you do to try to scare the other players, rather than to win the hand. There's generally no reason to do these below Jade / Tokujou, as the players won't really care about what you're doing below those levels. In Houou, they might see through you. They're all relatively minor.

Dora Pon Bluff

If the dora is a terminal or guest wind, and your hand is terrible, you can call pon on it and then force a yaku. As the game goes on, people will be more and more wary of you. They can't be sure if you're bluffing or actually close to tenpai. Generally, the easiest yaku to force is honitsu.

Their hands will slow down as they try to avoid dealing into you, and the chance of an exhaustive draw will go up.

There's also a slim chance that your bluff turns into an actual hand, a chance that's higher if people are trying to play around you and slowing themselves down. In particular, having three live honors in your hand is a worthwhile "atoatozuke." Atozuke is calling without a confirmed yaku, atoatozuke is calling without any yaku at all. The chance of one of them pairing is decent enough to justify calling a hopeful pon on a dora.

If your hand is good, you should just go for the dora 2 riichi, of course.

Flush Keiten Bluff

If you're going for a flush, but you don't end up making it, you can give up on the flush on the third row, but show people scary discards. When a flush player starts discarding honors and tiles from their suit, it scares people. You can keep middle tiles from other suits and try to connect to them to take tenpai before the end, and while doing so, cut honors and floating tiles in your suit to spook people and reduce the number of people in tenpai at the end. The gig is up if you cut one of the other suits from your hand after, though.

For example, you have a scattered hand like 34569m and two random honors, then draw a 5s. You can keep it and cut the honors / 9m to make keiten easier while scaring people.

Pushing Bluff

This is for when someone else is in riichi. If there's a tile in your hand that you know is safe, but that other people don't know is safe (for example, you have a triplet of a tile, which makes a kabe only you can see), then you can call and cut that tile. The other players will see you as pushing, and now they have to consider both you and the riichi player. Their number of genbutsu options will be reduced by a lot. You might force them to break the hand they were trying to maintain tenpai chances with, or they might cut a tile that's mostly safe vs both of you instead of a completely safe tile and deal in. Even if you cut a safe tile from your hand next, they won't know for sure if you're folding or just did a slide for safety.

Calling Only For Yaku

知らないと鳴けない副露3選 #2 - 3 calls you can only do if you know about them #2

With this hand, you can call 6p with 57p and discard the 9p to turn it into tanyao. There are basically three cases where you would want to do this.

1. It's All Last, and any win is fine

2. You're in a position where you don't want to call riichi (this might end up without a yaku)
3. There's something like a dora pon you want to stop

Turning your hand into tanyao lets you do additional calls to get to tenpai faster. When speed is all that matters, that is valuable. If you have a safe tile, you can do the same:

Call 6p with 78p, cut the west, then later cut the 9p.

In any round where you don't want to do a bad wait riichi nomi, this becomes an option. If you draw 25m (7 tiles), this is a yakuless, doraless shanpon tenpai. Red five is a dora at least. So, in this case, you can call 6p, then you have a tanyao nomi instead and can pon to tenpai. There's no need to pay the 1000 point riichi bet, and you can fold whenever.

There are a few shapes where you can call to add tanyao without kuikae or a safe tile:

12456: Call 3 with 24, cut 1, wait on 4-7
(you can even do this at tenpai, you won't be furiten)
123345: Call 4 with 35, cut 1
123456: Call 4/7 with 56, cut 1

These could also be adding a 234 sanshoku, or taking in another dora.

Similar shapes that can take in a dora include 234456. If the dora is the 3, call 3 with 24, cut 6. This also changes the 456 to a 345 if that helps with sanshoku. Likewise, you can call the red five with 46 and cut the 2. In these cases, you should slide your shapes to make it possible to call the dora, and avoid sliding them if it prevents you from being able to call the dora. If you draw 5, don't cut the 2 (in a safe situation).

Defense

Defending involves cutting safe tiles against a scary opponent. Often, that's a riichi player, but it could be a dora pon or just an open hand with a good chance of being tenpai. There are different levels of folding, and also various ways of identifying safe and dangerous tiles that will be introduced in this section.

We'll be referring to the danger of tiles a lot. Here's the average deal-in rate for each type of tile for reference, across all rounds:

	Non-Suji	Half Suji	Riichi Suji	Full Suji
1	6.6%	N/A	1.5%	1.5%
2	8.2%	N/A	5.2%	3.0%
3	9.6%	N/A	7.7%	4.5%
4	14.3%	8.3%	3.8%	2.2%
5	14.5%	8.7%	3.5%	2.2%
6	14.4%	8.3%	3.9%	2.1%
7	9.6%	N/A	7.7%	4.6%
8	8.3%	N/A	5.4%	3.1%
9	6.7%	N/A	1.5%	1.5%

Identifying Safe Tiles

Beyond suji, there are a couple easy to use and recognize techniques that consistently reveal safe tiles.

Sotogawa / Sakigiri

These two concepts are similar. It relates to the normal hand progression.

Sakigiri is the method of slimming your shapes to keep a safe tile. For example, with a 445 shape, you can cut the 4 and keep an honor for safety. This is usually done in the middle row, and is not usually done in the first row. Thus, if you see an early 4, you can view the surrounding suji (3-6 and 2-5) as safer. It generally **halves the danger of that suji**, but keep in mind that even if 3-6 is made safer, 6-9 is still dangerous. You can't say 6 is that much safer, unless they've also discarded the 9.

This is also useful for when your defense ability advances to the level of counting bad shapes. An early 2 is unlikely to have come from a 122, 224, or 233 shape, so the chance of 3 dealing into any bad shape is reduced considerably. But, it could still deal into a ryanmen from a 245 shape.

Sotogawa refers to tiles outside of the early discards. If someone has a 3 discarded early, then the 1 and 2 are sotogawa tiles. Same story for a 7 in the discards, 8 and 9 are sotogawa. In these cases, the 1/2/8/9 are about **as safe as suji 2/8.** This is a similar explanation to sakigiri. You wouldn't cut the 2 from a 223 shape, or the 2 from a 112 shape, early on for no reason.

Since the sakigiri 4 makes the 2 and 3 safer, but the 5 and 6 are still dangerous, it's fine to just think of the 2 and 3 as sotogawa of the 4. Of course, the 1 is suji. With a 4 in the early discards, the 2 and 3 are slightly more dangerous than their average suji variants.

This technique is quite powerful for identifying safe tiles. If you're in a situation where you're allowed to push suji tiles, you're also generally allowed to push sotogawa tiles. Note that there

are people who will lay sakigiri traps. It can be worth doing when the trap only costs you two tiles of efficiency, but any more than that and you really shouldn't.

Here's the data from the Houou replays for sotogawa's deal-in rate:

	Not	Tile in First 6 Discards				Tile in Second 6 Discards			
	Sotogawa	2 / 8	3 / 7	4 / 6	5	2 / 8	3 / 7	4 / 6	5
Non-Suji 1	8.3%	2.4%	3.4%	(suji)	10.5%	5.3%	5.1%	(suji)	8.2%
Non-Suji 2	10.0%	0.0%	2.9%	3.9%	(suji)	0.0%	5.3%	6.4%	(suji)
Non-Suji 3	11.0%		0.0%	5.0%	5.5%		0.0%	6.6%	7.3%
Non-Suji 4	14.7%			0.0%	12.3%			0.0%	13.5%
Non-Suji 6	14.9%			0.0%	12.5%			0.0%	13.1%
Non-Suji 7	11.1%		0.0%	4.9%	5.7%		0.0%	6.4%	7.2%
Non-Suji 8	10.1%	0.0%	3.0%	3.9%	(suji)	0.0%	5.3%	6.5%	(suji)
Non-Suji 9	8.4%	2.4%	3.4%	(suji)	10.5%	5.2%	5.3%	(suji)	8.3%

Additionally, because sakigiri is often done from shapes like 233, and not often from shapes like 244, if someone calls riichi on a safe tile (like an honour with some copies visible), the chance of them having a ryanmen wait increases. Suji tiles become safer in this case. To be specific, their deal-in rate is reduced by about 20%. Just, make sure you verify it came from their hand! **Tsumogiri riichis have lower ryanmen rates,** suji deals in around 50% more often against tsumogiri riichis.

Against Open Hands

There are two main ways of identifying safe tiles against open hands, outside of the obvious things like what yaku they're going for.

What They Didn't Call

You can look at the open player's kamicha. Any tiles there, they didn't call chii on. So, you can view them as safer, especially if the open player hasn't changed their hand much. You can also use this against very late riichis, where they would be expected to call to keiten when possible.

There are more complicated reads related to pons. For example, if the player across from the open player cut a 5, then the open player cut the same 5, they probably did not cut that from a 455 or 556 shape, considering they didn't call pon. If you combine this with things like kabe, it can reveal some safe tiles, but it's quite high effort.

For example, if you see all the sevens, you know in this situation they didn't just upgrade their 57 to a 78, and combined with the unlikeliness of a 455 shape, you can then say the 6 is safe. I would suggest not thinking about it that much.

Tiles Cut After Chii

After someone calls chii, if they cut a tile related to that chii, that area is often safe. Add the tile they've discarded to what they called with and see if it makes a sensible block.

> Call 3 with 24, cut 6: They had a ryankan, and have now cleared it.
> Call 3 with 45, cut 4/5: They had a shape like 445, and have now cleared it.

In these situations, the chance of them waiting on tiles in that area is quite low, though there are some complex shapes that end up waiting in this area. The tiles in that area can basically all be considered as safe as suji. But, don't get lazy with it. If it doesn't make a block, you can't see that area as safe. For example:

> Call 4 with 23, cut 5: 235 is not a block. This may have been a 23455 shape, and now they have a 45 ryanmen waiting on 3-6. The tiles in this area are not safe.

Identifying Dangerous Tiles

Techniques to identify dangerous tiles are relatively "safer" than identifying safe tiles. If you misjudge a tile as dangerous and avoid cutting it, that's generally fine when you have other safe options. If you misjudge a tile as safe and cut it, you can deal in.

Dora

The dora is dangerous. Does that need to be said?

To be precise, if a tile is dora, its chance of dealing in is increased by a flat ~3%. A non-suji dora terminal would be similar in danger to a non-suji 3/7. On top of that, it gives your opponent a han if it deals in.

The tiles near the dora are also slightly more dangerous, but their deal-in rates are only multiplied by 1.1x. There's no need to be overly scared of them.

Suji Counting

Suji counting is the act of counting how many suji have passed a player, and using that to estimate the danger of pushing against them.

Each suit has six suji, for a total of 18 suji. 1-4, 2-5, 3-6, 4-7, 5-8, 6-9.

To count the suji, count 2 for every unique 4/5/6 you can see in their discards, and then 1 for every other tile that hasn't already been accounted for. Let's try an example.
For 4/5/6 tiles, there's 4m and 4s, count two each so that's 4.

The 7s and 1m have already been accounted for by the 4s and 4m. Tracking these is the hardest part.

The 89s, 89p, and 8m haven't been, so that's +5.

Adding that up, we can see 9 suji. That's exactly half of them. Subtracting the number from 18 gives us the number of live suji, which is also 9 in this case.

Since there are 9 live suji, we can then estimate that our chance of dealing in when pushing a non-suji tile is 1/9. If we push the double non-suji 4p, it would be 2/9. In reality, the chance is a bit lower, since they aren't guaranteed to have a ryanmen wait.

The harder part is keeping the count going accurately as turns progress. If it gets to the point where all 18 suji are dead, then you know they have a bad wait. For even more accurate counting, you can consider kabe and sakigiri. Assuming they have a ryanmen, here's the chance of dealing in:

18 live	17 live	16 live	15 live	14 live	13 live	12 live	11 live	10 live
5.5%	5.9%	6.3%	6.7%	7.1%	7.7%	8.3%	9.1%	10%
9 live	8 live	7 live	6 live	5 live	4 live	3 live	2 live	1 live
11.1%	12.5%	14.2%	16.7%	20%	25%	33%	50%	100%

The danger really starts picking up around the 10-12 live suji area. Double these percentages for non-suji 456 tiles. 18~13 live is generally considered "early game," 12~7 is "middle game," and the rest is "late game." Push/pull decisions will change depending on these.

There are also some techniques that are actually shortcuts for suji counting.

Aida Yon Ken
This technique relates to gaps of four within the discards. For example, 4 and 9. The theory states that the enclosed ryanmen is more dangerous, in this case, the 67 ryanmen is enclosed, so 5 and 8 are dangerous.

If we combine this with the sakigiri theory from the safe tiles section, we can see just why it's dangerous.

The 9 is removing the 6-9 suji. The 4 is removing the 1-4 and 4-7 suji, and it's also turning the 2-5 and 3-6 suji into sakigiri ones. Five suji have been made safe or safer. So, of all the suji within that suit, only the 5-8 suji is unaffected and retains its danger. If you're not suji counting, learning to recognize these four tile gaps will reveal some dangerous tiles.

Here's a table showing the change in danger for each tile when an aida yon ken is present, gathered from the Houou replays. You can see the enclosed ryanmen is indeed more dangerous.

Tiles In	Waiting for X in Same Suit									
Discards	1	2	3	4	5	6	7	8	9	Other
Average Hand	2.4%	3.1%	3.7%	4.6%	4.7%	4.6%	3.7%	3.1%	2.4%	67.8%
1 and 6	6%	213%	55%	48%	164%	2%	65%	88%	49%	111%
2 and 7	72%	3%	173%	41%	44%	166%	2%	56%	99%	112%
3 and 8	100%	56%	2%	165%	44%	42%	171%	3%	72%	112%
4 and 9	50%	90%	64%	2%	164%	46%	56%	212%	7%	111%

Matagi Suji

Matagi suji is the theory that tiles near the riichi tile are dangerous. If you think of a 445 shape, you'd call riichi on the 4, so 3-6 would be dangerous. It could also be a 344, so the 2-5 is also dangerous. In a general sense, this doesn't hold up. Looking at all hands together, the matagi suji is not particularly more dangerous than other non-suji tiles.

However, there are cases where it is dangerous, and we can explain them through suji counting and sakigiri, similar to the aida yon ken section.

First, if they cut a pair to riichi, the sujis in that area are **much safer**. They're not more dangerous, they are safe. Cutting a pair from something like 4555 is quite rare, you'd rather cut your other pair for the three-sided wait. The percentages in this chart show the change in relative danger of those suji.

Prev	pathofhouou.blogspot.com					
->	Waiting On Ryanmen In Same Suit					
Riichi	1-4	2-5	3-6	4-7	5-8	6-9
1->1	2%	133%	103%	106%	110%	140%
2->2	21%	1%	122%	103%	121%	160%
3->3	22%	14%	1%	163%	124%	186%
4->4	2%	18%	14%	1%	157%	157%
5->5	271%	1%	20%	21%	1%	241%
6->6	154%	165%	0%	16%	15%	2%
7->7	190%	117%	167%	1%	12%	17%
8->8	154%	128%	102%	126%	2%	20%
9->9	133%	114%	105%	100%	138%	3%

If the riichi tile is the first tile they cut from that suit, there's generally **no significant change** in danger. I don't know why some of these tables I paste in are a bit blurry and others are not. Must be an oddity with Google Docs.

Prev	pathofhouou.blogspot.com					
->	Waiting On Ryanmen In Same Suit					
Riichi	1-4	2-5	3-6	4-7	5-8	6-9
None->1	2%	126%	82%	93%	102%	163%
None->2	150%	0%	97%	90%	122%	162%
None->3	138%	87%	0%	118%	127%	180%
None->4	1%	112%	70%	0%	146%	168%
None->5	195%	0%	80%	82%	0%	192%
None->6	167%	144%	0%	70%	117%	1%
None->7	185%	126%	119%	0%	84%	134%
None->8	164%	124%	91%	97%	0%	145%
None->9	166%	102%	91%	85%	128%	2%

If they cut any other two tiles, it can get very dangerous. Imagine they cut a kanchan shape, 7 then riichi on 5. The 5 removes the 2-5 and 5-8 suji. The 7 removes the 4-7 suji and makes the 6-9 suji sakigiri. The remaining two suji, 1-4 and 3-6, are unaffected, and so are dangerous. As it so happens, 4 and 6 are near the riichi tile. Matagi suji is real in this case.

Prev	pathofhouou.blogspot.com					
->	Waiting On Ryanmen In Same Suit					
Riichi	1-4	2-5	3-6	4-7	5-8	6-9
1->3	4%	185%	1%	121%	110%	140%
3->1	2%	64%	2%	191%	184%	202%
2->4	1%	4%	173%	0%	150%	150%
4->2	3%	1%	66%	1%	229%	211%
3->5	95%	0%	3%	234%	1%	236%
5->3	383%	4%	1%	57%	1%	256%
6->4	3%	304%	4%	0%	75%	1%
4->6	1%	71%	0%	4%	307%	3%
7->5	245%	1%	228%	4%	0%	90%
5->7	263%	1%	63%	1%	3%	368%
8->6	151%	158%	1%	170%	5%	1%
6->8	212%	230%	1%	66%	1%	2%
7->9	208%	188%	198%	2%	65%	3%
9->7	147%	118%	121%	1%	178%	4%

Ryanmen can depend on the order. Let's think about a 56 ryanmen. Cutting this kills the 2-5, 5-8, 3-6, and 6-9 suji. The dangerous order is 6->5. If they had a 5566 shape, they would cut 6 first, for red five acceptance. 1-4 and 4-7 are both dangerous. But, if they cut in the order of 5->6, the 5566 shape is less likely. The 4-7 suji is slightly safer, while the 1-4 suji is very dangerous.

Prev	pathofhouou.blogspot.com					
->	Waiting On Ryanmen In Same Suit					
Riichi	1-4	2-5	3-6	4-7	5-8	6-9
2->3	92%	3%	1%	170%	125%	165%
3->2	209%	2%	3%	152%	157%	192%
3->4	3%	120%	2%	1%	202%	154%
4->3	2%	209%	1%	2%	178%	188%
4->5	2%	1%	195%	1%	1%	227%
5->4	13%	2%	93%	0%	2%	240%
6->5	235%	1%	1%	183%	1%	1%
5->6	249%	7%	0%	86%	4%	9%
7->6	160%	196%	1%	2%	132%	2%
6->7	197%	182%	3%	1%	191%	1%
8->7	173%	118%	171%	1%	2%	95%
7->8	198%	155%	155%	3%	1%	214%

If you're not planning on counting suji, just remember, "pair is safe, single tile is normal, two different tiles means the area near the riichi tile is dangerous."

Against Open Hands

Tiles Cut After Chii

In general, if the tile doesn't fall into the safe zone talked about before, then that zone is instead dangerous. Note that this only applies to chii.

There's also a specific kind of chii that is exceptionally dangerous:

Kuinobashi

Kuinobashi refers to calling a tile to make your wait wider, rather than to advance your hand. The main way to identify this is **when they cut the suji of what they called.**

Here are the kuinobashi shapes this applies to:

23457: Call 1 or 4 with 23, cut 7, wait on 3-6. Run + kanchan
23446: Call 3 with 24, cut 6, wait on 2-5. Run + overlapping kanchan
24678: Call 5 with 46, cut 2, wait on 6-9. Run + separated kanchan

However, there are non-suji ways this can manifest, even in the same shapes:

23457: Call 3 with 45, cut 7, wait on 1-4
12456: Call 3 with 24, cut 1, wait on 4-7 (this gets tanyao)

Shanpon wait transformations are also difficult:

23455: Call 4 with 23, cut 5, wait on 3-6

Tiles Cut After Pon

If they call pon, you can't say the area around the discarded tile is safe or dangerous, it's just the normal level of danger. At most, you can say it's likely they have tiles in that area, but whether it's a wait or not can't be distinguished.

However, if someone calls pon, and then their next two cuts make a bad shape (e.g. pon -> cut 3m, then cut 1m) the chance of them having a tanki wait is higher. Suji can be riskier in this situation. Another case I heard is that the area around the tile cut after a pon is dangerous if it was an atozuke pon (i.e. their first call(s) wasn't yakuhai, but their last one was). You're more incentivized to keep three pairs in that situation. (See Tile Efficiency > Open Hands)

Folding Methods

When you're not in a position to push against your opponent, you still have a few options to choose from. A crucial aspect is that you should **decide which folding style you're using right away.** Don't just half-heartedly think things like, "This much is fine," and cut a suji 1/9 when you should be fully folding.

It's fine to switch between them as the situation unfolds, but be conscious of exactly what you're doing and your reason for doing so.

Complete Folding, Betaori

This is completely focused on minimizing your chance of dealing in. You will choose this when you are far from tenpai yourself, or when there's little value in fighting. The key feature of this folding method is that you think a lot about future safety.

Cut tiles that are safe now before tiles that are still safe later.

It's easy to auto-pilot and just cut the genbutsu tiles, but you should stay focused and optimize your order.

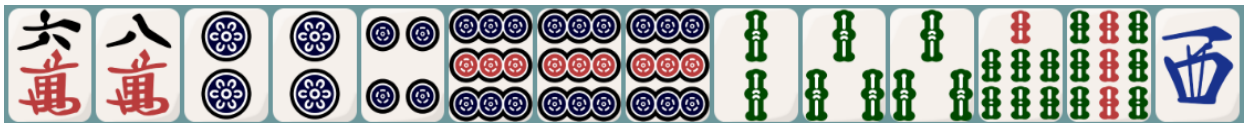
This involves cutting your middle tiles first. If the riichi player cuts a 5, and you have the last copy of a dragon in your hand, cut the 5 first before the dragon. If someone else chases the riichi, the dragon will buy you a turn of safety.

You should also pay attention to tiles you have that are safe against multiple players, and hoard those over tiles that are safe only against the riichi. If everyone has a 4p in their discards, and 1m is only safe against the riichi player, you would cut 1m first and save 4p in case of a chasing riichi.

Creating Safety
鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

What if you have no tiles that are safe? Let's look at this example from the book:

Your hand is:



Our deal-in rates, just looking at the rough averages, are something like:
Non-suji 6m: 14%
Sakigiri 4p: 11%
Non-suji 8m: 8%
Riichi suji 3s: 8%
No shanpon 9p: 5%
Suji 7s: 4%
Sotogawa 2p: 3%
Suji 2s: 3%
Riichi suji 9s: 2%

9s is the lowest deal-in rate. However, that's if we're only thinking about the current turn. If we cut this 9s, then the 2p, that's a total of 5%. If we instead cut 2p twice, that's a total of 3%, since the first one passing means the second is 0% deal-in. After that, the 9s is 2%, but if we cut the 5% 9p, we get three turns of safety. Cutting the safest single-turn tiles, 927s, would be 9% total deal-in chance, while 999p is 5%.

So, the safest series of six discards is 22999p9s, taking on a total of 10% risk. Even though these tiles are slightly more dangerous *now*, viewed in a long-term perspective, they give us more total safety. Going turn by turn, 9s22p27s9p would be a total of 17% risk. We might get more safe tiles along the way, any new safe tiles would get inserted into the order as we go, dragging it out longer than six turns.

If you have no safe tiles, think about how you can create safe tiles. Discarding a tile that makes another tile suji is another method. But, if the safety is too different, just cut the safer tile. There's always the chance they tsumo or show a new safe tile.

場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull

In this book, yoteru specifically mentions he would cut a non-suji terminal pair over a suji 3/7 in most situations, if those were the two safest options in the hand. If the possibility for a kanchan wasn't there, he would cut the suji 3/7 first, but if it was a triplet of terminals, he would cut those first even with the kanchan gone. With both kanchan and penchan gone, suji 3/7 becomes best. Folding is hard…

When completely folding, think about your next several discards, not just this one.

Pros:

- You minimize your chances of dealing in, even against chasing riichis.

Cons:

- You minimize your chances of winning the hand or avoiding noten payments.

Maintaining Potential Safely

This is still completely folding. You will only cut safe tiles.

Hands that use this folding method can see a path to tenpai. Consider all the safe tiles in your hand, and try to imagine whether the remaining tiles could become a tenpai hand with good draws. Also consider all the dangerous tiles in your hand. If you have too many dangerous floaters, they might block you from getting tenpai.

With this, you order your safe tiles differently compared to complete folding. You try to keep your chance of getting (back) into tenpai as high as possible. Common themes in this folding style include cutting blocks that are entirely safe. If you have a 45p ryanmen, and both are safe tiles, you can cut that block and try to make a new block elsewhere. You generally won't break apart shapes where not every tile is safe, as it's harder to remake them.

You also don't need to have any intentions of chasing the riichi. You can sit in dama even with a yakuless hand, and then if you happen to tsumo, you're very happy. If you draw a dangerous tile, you can go back to folding.

If you draw too many dangerous tiles to maintain tenpai chance, switch to complete folding.

The value of this folding method is directly linked to the value of tenpai, so it's higher when you're the dealer.

Pros:

- This makes it easier to avoid noten payments at the end of the round, or to earn a dealer repeat.
- The chance of winning is a chance of preventing a big gap from forming.
- Your chance of dealing into the riichi is still minimized.

Cons:

- You often have less safety if someone else chases the riichi.

Softly Pushing, Mawashi

This is halfway between pushing and folding. You can consider it a step above the previous method. You will generally only do this while at 1-shanten with a borderline hand.

How much risk you're willing to take depends on the situation, but a good rule of thumb is: **Don't cut anything more dangerous than a suji 2/8.**

This means suji 1/9, nakasuji 456, and most live honors are fair game. Suji 3/7 and riichi suji 2/8 are too dangerous.

If you feel the need to be a bit safer, suji 2/8 and live honors can be removed from the candidates. If you're willing to be a bit riskier, suji 3/7 and riichi suji 456 can be added. If you're doing any more than that, you're just fully pushing. The times you should adopt this sort of style are reflected in the EV charts.

Pros:

- Higher chance of getting tenpai compared to the above.

Cons:

- You can deal into bad waits. Be aware of the 1~3% chance of dealing in that these tiles have and don't be surprised if you do.

Folding Against Open Hands

When folding against an open hand, you often can't be sure whether they are tenpai. So, your considerations are simultaneously what tiles are safe, and what tiles might be called, especially when the open player is to your right, your shimocha.

If your kamicha/toimen just discarded a tile, you won't deal in with that tile on this turn. However, your shimocha might chii that tile if you discard it. If you have plenty of safe tiles against the open player, you can avoid cutting that tile to prevent it from being called. If your number of safe tiles is low, you should prioritize your own safety and simply cut the same tile.

When folding against multiple open hands, matching the discards when possible is the safest.

Another consideration is toitoi hands. Since they're all triplets, suji and kabe have no meaning against these hands. The danger of non-genbutsu tiles is pretty directly correlated to how many of those tiles you can see. Live tiles are dangerous. Thrice-cut tiles are safe. Twice-cut tiles are pretty safe. They would have to be doing a hell wait on that tile, and if it's a 2~8 tile, they would likely choose a better tanki.

場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull
Yoteru suggests that, if you're low on safe tiles and you're still not sure if the open player is tenpai, you can cut non-suji 1/2/8/9 until the midgame or the open player tedashis, as a sort of sakigiri. 3~7 are too dangerous in the case that they are tenpai, with the other non-suji number tiles striking a good balance.

See also Jamapon for when you're against a flush player, and When to Fold Against Open Hands

Facing Multiple Riichis

令和版 現代麻雀技術論 - Modern Mahjong Strategy

If you are not tenpai, and there are two riichis, you are heavily incentivized to fully fold. If you have tiles that are safe against both players, that's easy enough, but what if you don't? How do tiles that are safe to one player compare to each other?

The safety ratings are basically as follows. All ratings for "honor" also apply to 1/2/8/9 with a visible kabe. The percentages given are an average, they'll be lower in the early game and higher in the late game. Suji counting gets quite hard against two riichis.

S Rating (~0% Deal-in Chance)
Thrice-cut honor (can deal into Thirteen Orphans)

A Rating (<5% Deal-in Chance)
Twice-cut honor (can't deal into double ron)
Both suji 1/9
Once-cut honor early game

B Rating (~5% Deal-in Chance)
Genbutsu + suji 2/3/7/8
Both suji 2/3/7/8
Suji + non-suji 1/9
Live honor early game

C Rating (~10% Deal-in Chance)
Genbutsu + half-suji 4/5/6
Once-cut honor late game

D Rating (~15% Deal-in Chance)
Live honor late game
Genbutsu + non-suji 4/5/6
Suji + half-suji 4/5/6
Suji + non-suji 2/3/7/8
Both non-suji 1/9

E Rating (~20% Deal-in Chance)
Both non-suji 2/8

F Rating (~30% Deal-in Chance)
Both non-suji 4/5/6

You should decide which player you'd want to deal into the least. For example, if one of them is the dealer, or one of them is fourth, you would rather deal into the other riichi. So, between multiple tiles that are suji + non-suji, or safe + suji, you'd pick the one that's suji to the player you want to deal into less. If it's roughly the same, chasing riichis have better waits on average, so choosing the option that's suji to the second riichi might be a bit safer.

Push / Pull

Push / pull is the art of deciding whether you should fight with your hand, or fold. 2-shanten hands are easy folds, but it gets complicated at 1-shanten.

In Riichi Book 1, it says to push if two of the following are true:

- You're tenpai
- You have a good wait
- You have an expensive hand

And "expensive hand" is defined as 7700.

This is quite conservative. If you want to move from this to the more aggressive modern theory, the simplest change is redefining "expensive hand" as 3900. That's still a bit conservative, but a pretty good approximation.

Pushing With Open Hands

Before anything else, I'll briefly comment on the differences pushing with open hands has.

First, compared to closed hands, open hands have less value. They can't get tsumo, ura dora, or ippatsu.

However, to make up for that, they don't have to pay 1000 points to push. This makes pushing with them easier. With a riichi hand, even if you don't deal in, you're still giving your opponent an extra 1000 points.

Additionally, each call you've made increases your chance of dealing in even if you try to fold by 1~2%. This also increases how much you want to push.

You can also change from pushing to pulling at any time, unlike calling riichi.

Overall, open hands tend towards pushing more.

As another thing to keep in mind, if the riichi player is to your left and your hand is open, you can chii the tiles they discard. This can make pushing at 1-shanten a bit more viable. Normally hard to call tiles might come out.

Average Riichi Value

To properly evaluate the risk we're facing, we should be aware of the average value of enemy riichis. This table is from Modern Mahjong Strategy, which probably got it from Miinin.

	Dealer Tsumo	Dealer Ron	Non-Dealer Tsumo	Non-Dealer Ron
Ippatsu Turn	13528	10831	9291	7445
Not Ippatsu	9882	7562	6939	5172

The number of dora visible can change this, but when discussing average situations, these are the numbers that will be in mind. Rounding to a nearby hand value, dealing into the dealer is on average about 7700, and dealing into a non-dealer is on average about 5200, three han in both cases. If the dealer tsumos, you can expect to pay around 3000~4000, and if a non-dealer tsumos, you can expect to pay about 1600~2000 as non-dealer or 3200~4000 as dealer.

Comparing these, dealing into a non-dealer riichi as a dealer is only a difference of about 1000~2000 points. That makes it easy to see why pushing as dealer is often good.

EV Charts

You can find an analysis of the situations here: https://docs.google.com/spreadsheets/d/172LFySNLUtboZUiDguf8l3QpmFT-TApUfjOs5iRy3os/edit?gid=899556795#gid=899556795

In many situations, particularly throughout the East rounds, you can rely on this for an accurate judgement of whether you should be pushing or pulling. A red square means that, if you pushed this in a million games, the results over all of them would average to be more than a 500 point gain. Blue is the opposite, more than a 500 point loss.

As non-dealer, these charts largely match the previous criteria. Have two of tenpai, good wait, and 3900 points of value. The big standout is that pushing two han bad wait tenpais is also acceptable (but not 2 han very bad wait tenpais), especially when your hand is open.

As dealer, you can push pretty much any tenpai. You can also push suji tiles from most 1-shanten hands, but pushing non-suji tiles is harder. Cases where you can push suji but not non-suji tie into mawashi.

Keiten

Keiten refers to taking tenpai at the end of the round, even if you don't have a yaku, to avoid the tenpai payments. As the first Tenhoui ASAPIN said, "Keiten is a hand worth fighting with."

Comparing being noten to being tenpai, it's either -3000 vs 0, -1500 vs +1000, -1000 vs +1500, or 0 vs 3000. It's a difference of 2500~3000 points. No matter what your hand is, if you reach the end of the game in tenpai, it's almost like you just won a 2 han hand. A 2 han good wait tenpai is often worth pushing with against a riichi, and this is in a way better than a good wait. It's a guaranteed win… if you don't deal in.

Imagine you're tenpai against a non-dealer riichi, and there are 5 live suji remaining. On your last draw, you draw the non-suji 4m. The chance of dealing in is as high as 40%! The average value for dealing into a non-dealer riichi is roughly 5200. If we cut it, it's 40% for -5200 (2080), and 60% for +2500 (1500). The expected value from pushing is around -580. But, breaking tenpai means you lose at least -1000. So, even in this case, we can say it's worth pushing, as we lose 420 fewer points on average. The EV chart likewise has that square in orange. When it's not our final draw, the potential of drawing more dangerous tiles in the future makes it go towards folding.

As the dealer, you can push most tiles with even 4 discards left to go against a riichi to keep tenpai.

As a non-dealer, you don't often want to push non-suji 456, but you can push most other things with 3 discards to go against a non-dealer riichi. If it's a dealer riichi, keep it to suji.

Vs Open Hands

令和版 現代麻雀技術論 - Modern Mahjong Strategy

For suji counting, keep in mind that open hands often have many fewer suji. Tanyao hands can't use 6 of the suji, so it starts at 12. Flush hands can only use 6. You'd probably prefer to count all shapes vs a flush.

There are two factors: How expensive is their hand, and how likely are they to be tenpai?

For example, say they have two calls, one of which is a dora pon, in the middle of the second row. Their points are likely 8000, and their chance of being tenpai is about two in three. Multiplying the points by the tenpai chance, we can put it at around 5200, which is close to the average value of a non-dealer riichi ron. So, in this case, we would view them as such.

Though, the push/pull decisions do move *slightly* more towards folding, as there is no riichi stick in play for you to claim. Your value when winning is 1000 points less than if they were truly a non-dealer riichi.

From the data I gathered from Houou replays, we can see these patterns:

- With one call, they are 50% tenpai on the third row.
- With two calls, they are 50% tenpai at turn 8, going up to 70% on row three
- With three calls, they are 50% tenpai at turn 4, 85-90% starting on row two

You can use that as a start until you learn discard reading. Now, the decisions.

Low Threat Situations
This is when facing 2 han or worse hands with a high tenpai chance, or 3 han hands with ~50% tenpai chance. So, a three call 2 han hand or a two call 3 han hand on row two.

If you're tenpai, or 1-shanten as dealer, you should be pushing. You should be folding in the mid-game with a bad shape nomi 1-shanten, or any 2-shanten. You can push good 1-shantens. There's no pressing need to fear a tanyao in the first row if it's not showing any dora.

Medium Threat Situations
This is when facing non-dealer 3 han hands with a high tenpai chance, or mangan hands with ~50% tenpai chance. So, a three call 3 han hand or a two call mangan hand on row two.

You can treat this about the same as facing a non-dealer riichi, keeping in mind the deal-in rate changes due to the reduced options. You obviously do not need to fear a non-suji 4s when facing a circles flush.

High Threat Situations
This is when facing non-dealer 4 han or dealer 3 han hands with a high tenpai chance. Something like three flush calls including a yakuhai and red dora, or a dora pon + 2 calls, on row two.

The average dealer riichi ron is about 8000 points. Since our opponent here is also around 8000, you can treat this about the same as facing a dealer riichi, though the non-suji tiles are of course much more dangerous. A non-suji 456 deals into an open tanyao more often than it deals into a riichi.

Low Value Situations
When your own hand is bad, like 2-shanten for a riichi nomi, you should just fold against any calls when they're around the 50% mark. The risk-return isn't worth it.

Note that multiple people calling can also lead to an increased threat. If everyone has done one call by the second row, even if you say the chance of any individual player being tenpai is 25%, the chance of one or more people being tenpai adds up to being close to 60%. So, you would still want to start moving towards folding here with a bad hand.

See also Folding Against Open Hands

How To Push

Even when we've decided to push, we don't just want to push everything without any thought. We still want to strike a balance between our winrate and our deal-in rate. Imagine we're facing a riichi with these discards:

2s was tsumogiri. Our hand is as follows:

A 1-shanten hand with good value and waits.

Discarding 3s is the widest ukeire (29 tiles). However, it's non-suji. Additionally, after cutting 3s, we usually have to cut another non-suji tile for tenpai.
Draw 6m (2 tiles): Cut the safe 7m (1 total suji pushed)
Draw 47m36p (14 tiles): Cut half-suji 6m (2 total suji pushed)
Draw 58m45p (13 tiles): Cut non-suji 4p or 5p. (3 total suji pushed)

Another option is to cut 2s. This is an immediately safe tile. The only ukeire is 58m36p (15 tiles), but upon drawing any of them, we get to cut the half-suji 4s. So, we get to tenpai with only 1 suji pushed each time. This is a bit similar to mawashi. Taking this path is more advantageous.

Keep in mind both which tile you have to push now, and which tile you have to push when getting tenpai.

Facing Multiple Riichis

If you're tenpai against multiple riichis, the extra sticks on the table make pushing quite appealing, especially with an open hand. However, if you're not tenpai, the risk of cutting unsafe tiles from 1-shanten or worse is doubled. Refer to the Defense section for tile safety ratings against two riichis.

1-Shanten or worse
You should not be cutting unsafe tiles unless the point situation forces you to push. Cut the safest tiles you can.

Good Wait Tenpai
If you're the dealer, push.

If the tile you need to push for tenpai is a non-suji 1/9 or safer, push.

If it's a non-suji 2/8 or worse, your hand should be worth 2600+.

Bad Wait Tenpai
The more risky the tile you're cutting is, the higher value your hand needs to be to justify it.

C Rating or better: 2 han as non-dealer, anything as dealer.
D Rating: 3 han as non-dealer, 2 han as dealer.
E Rating or worse: 4 han as non-dealer, 3 han as dealer.

Even if you can get tenpai by cutting a safe tile, you shouldn't riichi with a bad wait nomi. Keeping the option of folding is better.

Point Situation Considerations

天鳳位がラス回避のコツを解説します - Tenhoui explains the secrets of fourth place avoidance

One of the biggest influences in how you play is what the current point situation is like. Online ranked Mahjong is largely a game of avoiding fourth place.

East Rounds

For the most part, you **do not significantly change your play before South**. Yes, even against last place riichis. And even as last place, you don't need to play like a maniac. There are still plenty of rounds left.

However, there are situations where there might not be rounds left where you do alter your play. If you're playing in a ruleset that has no tobi these don't apply.

Fourth Is Close To Busting
The main situation that can warrant some special care is when another player is about to bust.

…

Anyway. In these situations, you can treat it similarly to a South 4. If you tsumoing would knock out fourth place, you should be aiming for a hand that raises your placement while you do so. Refer to the Making a Comeback Hand section.

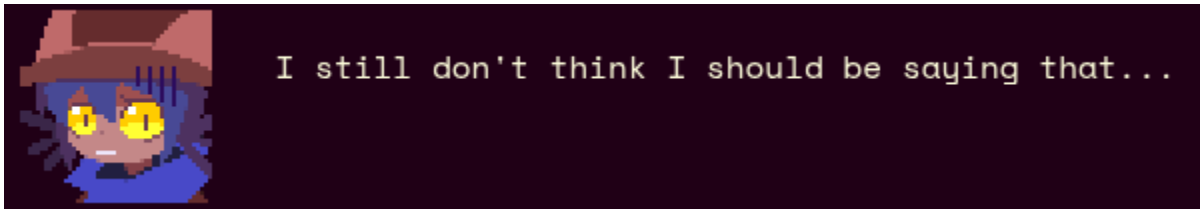
Dealer (You): 30700 South: 43100 West: 1500 North: 44700

This is like needing a mangan to come back in South 4. If you can get a mangan tsumo, you will bust the West player and take first place. Unlike South 4, getting a 2000 all tsumo won't let you keep going, and you'll confirm third. You're already a comfortable third, there's no value in that.

Dealer: 2300 South (You): 38100 West: 40700 North: 38900

This is like needing a 1300/2600 tsumo. You'll bust the dealer and take first. A 3900 ron on the dealer would also work. Unlike in South 4, other rons won't end the game, but you should still take them in most situations. Rising to first is valuable.

You're Close To Busting
The opposite of the above situation. It's a much more pressing situation when you're the one who's about to bust.



Anyway. When you're the one at risk, your questions when facing a riichi are:

1. If they tsumo a mangan, do I survive?
2. If I'm not tenpai at the end, am I at least left with a riichi stick?

If both of these are true, you can fold normally with 2-shanten or bad 1-shanten hands and hope for a better hand in the next round, especially if another player is showing intentions of fighting. Against a non-dealer, this is cleared with 2500 points. Against a dealer, or as dealer, you need 4000 to survive.

If they're not true, and especially if being noten means you lose, you are forced into pushing in most situations.

South Rounds

Starting in South 1, you should **stop picking meaningless fights** with players that are far apart from you. The two main situations this comes up in are:

1) Riichi from a player with a large lead over you, especially if they are dealer
2) Riichi from a player far below you

In these situations, your requirement to push should be higher. Against the dealer who is far ahead, if they tsumo, nothing changes. Everyone loses the same amount of points, the round doesn't advance, and the person with a huge lead continues to have a huge lead. However, if you deal in, you're doomed. This applies even if you are in fourth. Someone else dealing in is good for you. The round repeating is good for you.

In these cases, your quarrel is not with the far ahead player(s). Your quarrel is with the people close to you in points. With the top two players being 35k and 32k, and the bottom two players being 18k and 15k, the bottom two want to get out of the way of the top two calling riichi.

Against the person far in fourth, if they tsumo it's probably not a big change, but if you deal in, you might be at risk of taking their place. In the above situation, the top two players don't want to fall down and join the rabble. They want to get out of the way when the bottom two call riichi.

These are basically "high risk" situations. You want a high return to match. Don't push or chase with 1-2 han hands, especially with bad waits, but you can push with good hands.

鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

Dealer: 42000, South: 30,000, West: 17,000, North: 10,000
The dealer has a big lead, South is also far ahead, and West and North are far behind.

With a bad hand, Dealer only wants to chase South, South doesn't want to chase anybody, West and North want to chase each other but won't fight the others. Those are the distinctions between "worthwhile" and "meaningless" fights.

With a pinfu dora 1 hand or better, it's fine to fight. You have a good wait and good value, it's enough to be worthwhile. You can use normal riichi / dama judgements.

South 3

In South 3, your considerations are as follows:

- How many points can you deal into?
- How many placements could you fall from someone tsumoing? (If you're dealer, someone tsumoing a mangan could drop you 2-3 places)
- What's the chance that someone dealing into someone else drops your position?
- What's the chance of entering the West round?
- What will the situation in South 4 be like? (e.g. if you deal in, what's your chance of getting fourth in S4? If you win, how much of a safety net does that get you in S4?)

Now, that's a lot to remember. To boil it down into actual strategy, there are these guidelines:

- As First or Second, you should fold if there's any danger of you falling to fourth, even if you have a good hand. This also includes falling to a risky third.
- As Third, you should fold if there's any danger of you falling to fourth, BUT you should fight against Fourth with good hands to prevent them from winning and overtaking you.
- As Fourth, as long as your hand isn't bad, you should fight.

Against riichis, assume they have a mangan if you deal in.

Slight Lead

Imagine the scores are 27300, 26200, 24500, 22000. You're currently in first, but a wrong move could send you down to third or fourth.

Following the list of considerations, the way things tend to play out is:

- If you're tenpai with a yaku, and dama doesn't get you above 30,000, you should generally riichi first row, but second row bad waits go much heavier into dama
- If it gets you above 30,000, you can dama, especially with a bad wait
- You should not chase riichis

Tanyao dora 1 would not get us above 30,000, so it would be a riichi early, even with a bad wait. Everyone in this situation will be cautious of dealing in, the chance of them folding is high. Sanshoku dora 1 would get us above 30k, so we could dama that. A pinfu dora 1 is a good wait, so we could riichi whenever, as long as we're first to do so. If someone else is in riichi, we stay dama and strongly consider folding if we draw anything dangerous.

Fourth Place
Since you can't fall any placements, you're highly incentivized to push in most situations, and the main questions that matter are the last two.

The potential South 4 situation is the most pressing. It's very unlikely to get a hand worth more than a mangan. Thus, you should aim to make the gap between you and your rival (third place, usually) in South 4 a mangan tsumo or less. If neither of you will be dealer in South 4, that's a 10,000 point gap. If they are dealer, the gap can be 12,000. If you're dealer, you don't have to get there in one go.

In South 3, if you don't have the opportunity to make an expensive hand, at least try to make a hand that will enable the mangan tsumo condition. If it is already possible, a quick hand to prevent them from winning and widening the gap is also valuable, and it can help lower your condition to a cheaper hand. If your rival is the dealer in South 3, someone else tsumoing could also help you, so you might fold even while in fourth.

If it's possible to win a hand that brings everyone below 30k, that's also valuable to give yourself another shot in the West rounds. The dealer winning to give you another chance at a good hand is also welcome, as long as they're not your rival.

South 4

See also All Last Techniques.

The push/pull in South 4 changes as your rank does. Points are no longer a consideration, it's purely placement. On Mahjong Soul, there is merit to points, as you do get 1 rank point per 1000 points you gain. However, with fourth being an up to 250 rank point loss, rising from fourth to third is basically like winning a hand worth 250,000 points, so placement is still the main consideration.

Let's look at the point spread for a 6-dan player in Tokujou: +75 +30 0 -120. It's hard to do mental math with big numbers, so convert it to something easier first. Double it to remove the 5, +150 +60 0 -240. Divide each by thirty to get small numbers, +5 +2 0 -8.

We can then use this to evaluate the risk and return. If we're third, and have a hand that could get us first but might end with us getting fourth, that's a difference of +7 vs -8. As long as your winrate is even slightly better than your chance of losing, it will be mathematically worth it.

But if it's "a chance of second" vs "a chance of fourth," it's +2 vs -8. That's much harder to justify. Though, a big exception is Mahjong Soul's Celestial rank. In that situation, it's +0.4 vs -0.3, and so any situation as third that's a coinflip between second and fourth is worth going for.

If you're second, first vs fourth is +3 vs -10. You need an extremely high chance of winning for that to be worth it. First vs third is +3 vs -2. Do the math for your own rank and evaluate where the lines are.

When Tsumo Makes You Last

You're third with 19500. Fourth has called riichi, and has 14500 points. Neither of you are dealer. If fourth tsumos, you almost certainly become fourth. However, you survive the noten payments.

Of course, they're not guaranteed to tsumo. The later in the round it is, the lower their chance is.

Generally, in these situations you can push on the first row. The third row you should be folding. In the middle it's a bit harder to judge, but it's often better to fold, or at least limit your pushes to things like terminals. If you don't survive noten payments, you pretty much have to push.

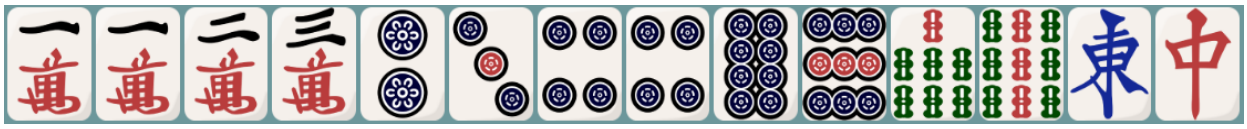
Here's an example from NAGA:

This is a 3kyu game, so obviously you just push the haneman since there's no penalty for getting fourth. But, for fourth place avoidance, you would fold since you survive the tenpai payments.

Distant Second
Dealer: 40500 You: 29400 West: 25500 North: 24600

You have two goals in this case. Goal one is to avoid last, and it's the most important goal. The secondary goal is keeping second. With the point situation being as it is, dealing into 5200 from anyone makes you last. Thus, you very much need to minimize your chances of dealing in.

If you don't have a particularly fast hand, either something full of good shapes or callable, you should just fold from turn one. Any outcome that doesn't involve you dealing in will, at worst, cause you to be third, and there's quite a good chance you remain second. The point difference between 3rd and 4th is less than 1000, meaning both are incentivized to go as fast as possible.



This opening hand is 2-shanten, but was determined in the book to be too slow to be worth going for. It can't be called, the 89p79s shapes are bad, and it's yakuless so even if it gets tenpai it can't effectively be dama'd. The first three discards were 44p3m.

あなたの成績を爆下げする致命的ミス3選 - Three Fatal Mistakes
In this video, yoteru says there are three times when you can be forgiven for dealing in and falling from second place (as any second, not just a distant one):

1. It was an early dama / open hand you dealt into
2. You had an **early good-wait no-yaku** riichi and ended up dealing in
3. The point situation made it so you would be last by noten payments, so you had to push

A riichi with yaku, bad wait riichi, and chasing riichi are all unforgivable, as are any deal-ins outside of these where you did not cut the safest tile available to you.

Tenpai Decisions

This section is for decisions you have to make upon reaching tenpai, or while already in it. Whether to riichi, how to riichi, and whether to win.

Dama Judgement

Dama reduces your potential value, but usually increases your winrate. It also allows you to upgrade your hand, widening your wait or gaining more yaku. This assumes your hand has a yaku. If you have no yaku, call riichi unless you're planning to fold or the wait is particularly bad.

For EV

鬼打ち天鳳位の三人麻雀 勝利へのプロセス - Oshirase's Process of Learning Sanma
(Yes, it's a sanma book, but it had the tables for both to compare. The tables were the same.)

	Good Wait			Bad Wait	
Han	30 fu	40 fu	50 fu	40 fu	50 fu
1	**r**	**R**	**R**	**r**	**r**
2	**R**	**R**	**R**	**r**	**r**
3	**R**	**R**	**d**	**~**	**D**

4	**~**	**d**
5	**~**	**d**
6	**d**	**D**

R - Always riichi.
r - You should riichi these, but you can dama if the situation looks bad.
~ - This can go either way, depending on how early it is and how your wait looks.
d - You should dama these, but you can riichi if the situation looks good.
D - Always dama.

A good wait mangan can go either way. Since your chances of tsumo are good, you can riichi in the early rounds, or in the early part of a round, and aim for a haneman. If the wait looks good, for example two players have already discarded tiles from your wait, staying dama has more merit.

3 han with 60 fu or more is a mangan, but adding riichi + tsumo won't turn it into a haneman, so it's a dama. 3 han 50 fu goes from 6400 to 8000, only 1600 extra points. 4 han 25 fu is the same, but you can get up to haneman with a tsumo.

You also generally should stay dama if the wait is very bad, like a 456 kanchan, or when you only have two outs left.

Bad Wait Nomi Tenpai
愚形リーチのみをテンパイしたときどうすればいいかを徹底解説します - What to do when you get tenpai with a bad wait riichi nomi
愚形の立直判断を先手・後手全パターン徹底解説 - Bad wait riichi judgement, all patterns explained

As a dealer, you can just riichi any bad wait. But as a non-dealer, this is quite a tricky case. The first thing to consider is just how bad the wait is.

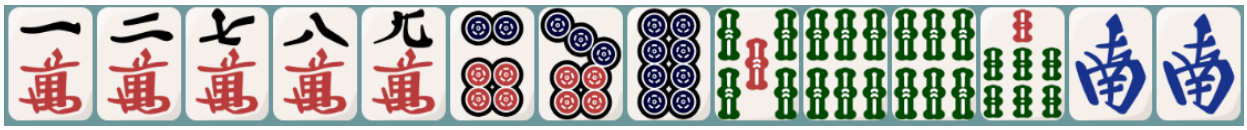
Something like a terminal+honor shanpon is, by the numbers, a bad wait, but it has a win rate comparable to an aryanmen. That's much different from a kanchan 4 wait. If your wait's on the good side, just riichi.

As for what exactly constitutes a "good bad wait," the lower limit is a 4/5/6 + honor shanpon. Anything better than that is fine to riichi. A live 2/8 kanchan is also okay. It has a win rate 5~10% higher than the other kanchans/penchans.

If your wait is on the bad side, it can truly go either way. In the first row, riichi has more value, as you can make your opponents fold. After that, dama becomes more and more appealing. Some players just have a rule to never riichi them.

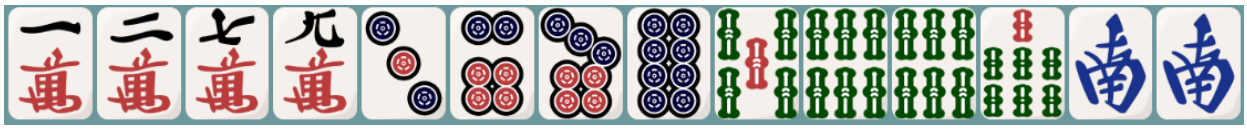
Now, if you don't want to call the riichi, in many cases you should break tenpai and kill the bad shape. Particularly if you have floating tiles that can make ryanmen shapes, or have a way to upgrade into value. It's not a choice between riichi or dama, it's a choice between riichi, dama, and 1-shanten.

In an obvious case, if you have 4567 or 3445 shapes in your hand, you have a ton of ways to get a ryanmen. If your wait would be a 24 kanchan, cutting the 2 gives you five ways to get a ryanmen tenpai. If that also secures pinfu, then you should definitely break tenpai. 3445 also leads to iipeikou sometimes.



Cut 1m rather than accepting the tenpai.

However, you should be aware of this before you even reach tenpai in the first place. If we go back to how this hand was at 1-shanten, maybe it was:



Cutting 3p gets us to 1-shanten. But, at that 1-shanten, drawing 3m or 8m gives us a bad wait riichi nomi. If we wouldn't call riichi, then we should just cut 1m right now and go back to 2-shanten with more upgrades, maintaining the 24p acceptance.

If Your Wait Is Safe

令和版 現代麻雀技術論 - Modern Mahjong Strategy
場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull

If another player has called riichi, and your wait is safe against them, people might deal into you if you stay dama while they fold against the riichi. In these cases, dama judgements change. In a normal situation:

- Any bad wait hand prefers dama
- A 3 han 40 fu good wait or stronger hand prefers dama
- A good wait below 3 han 40 fu is still a riichi (except pinfu nomi, which can go either way)

You can consider how your wait looks with both of the riichis in consideration. If you're waiting on 5-8m with 8m being safe against the other riichi, and you have a 7m in your early discards, people will see the 8m as safe against both of you. This is particularly effective if you and the other riichi have close to no overlapping genbutsu tiles. In these cases, riichi has value for the normally dama hands. The chance someone deals into you is still relatively high.

If the tile you have to cut is particularly dangerous, reasonably strong players will notice you pushing and be on guard anyway. If there's a lot of overlapping genbutsu between you and the

riichi player, it won't be difficult for them to defend against both of you. Riichi has more merit here.

Against two opposing riichis, both of which your wait is safe against, the value of riichi goes up compared to chasing one riichi. First, your chance of ippatsu is basically tripled compared to a normal riichi. Second, there's only one person folding instead of two, and the two riichis are going to be showing a lot of safe tiles. But, if there are close to no overlapping genbutsu between the two other riichi players outside of your wait, dama still has merit, especially in situations where win rate is very important, as the folding choices are much more limited.

For Upgrades

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In most situations, it's only worth waiting for upgrades during the early game (first 6~8 turns), call riichi after that.

Upgrading Wait
For it to be worth waiting for a wait upgrade alone, you should have…

1. 3 han
2. 4x as many upgrades as outs

Four times as many upgrades as winning tiles would be like a 35678 shape (wins on 4, upgrades on 2679), or a middle shanpon like 44m66s (upgrades on 25m57s).

If you have 1 or 2 han, Modern Mahjong Strategy suggests you should have 9 types of tiles that upgrade the wait. For the most part, that's only tanki waits. But a live 1/9/honor tanki is also worth calling riichi on immediately, the win rate is comparable to a ryanmen.

You should always dama chiitoitsu waiting on a non-suji 456 for a better wait. In the early game, dama half-suji 456 and non-suji 37. Anything outside of that should be riichi'd immediately.

Upgrading Value
It's worth waiting for a value upgrade with a 1-2 han hand if 6+ types of tiles will give you +1 han. With 3+ han, refer to the dama for EV section above.

2m is dora. Dama 7s. This hand gets +1 han if you draw the dora 2m, 4m for tanyao, or 57m57p for pinfu. Six types, so you can dama and look for value.

Dama 2p. 37m gives pinfu, 36p gives sanshoku, 47s gives tanyao. Six types, so you can dama and look for the value upgrade.

Waiting for things that upgrade both wait AND value is also valuable. For example, if your hand is tanyao except for a 13 shape, you can stay dama. Then, if you draw a 3~7 tile, you can cut the 1m to go back to 1-shanten and aim for a ryanmen and/or tanyao upgrade with the two floating tiles.

Honitsu is another special case. If your tenpai hand is entirely honitsu except for one ryanmen, you can cut that ryanmen if you have a floating 3~7 tile in the honitsu suit. If it's a worse floating tile than that, just take the riichi.

Wait Selection

First to Riichi

In short, going from 1->2 han isn't worth taking a bad wait for. But, going up to 3 han is.

1 han good wait vs 2 han bad wait
For example, 235, 5 is red. Take the good wait.

1 han good wait vs 3 han bad wait
For example, 245 with a 234 sanshoku. Take the bad wait.

2 han good wait vs 3 han bad wait
For example, 235, 5 is red with another dora elsewhere. Take the bad wait.

3 han good wait vs 4 han bad wait
For example, 245. 2 is riichi pinfu tanyao, 5 is riichi tanyao sanshoku. Take the good wait.

1 han good wait vs dora tanki
If the dora is non-suji 456, they're mostly the same, otherwise it goes in favour of the dora tanki.

Chiitoitsu good wait vs dora tanki
If the dora is non-suji 456, take the good wait (e.g. honor/suji tanki) unless you're in desperate need of points. Otherwise it goes in favour of the dora tanki.

Chasing Riichi

Things can get a little complicated when you have the choice between pushing a safe tile with less value, or pushing a dangerous tile with more value. Here are the common comparisons.

Safe tile with bad wait VS dangerous tile with good wait
For example, a 235 shape. Cut the dangerous tile, unless it's a double non-suji 456. Or, if you count suji, don't cut it if the live suji is around 7 or less, about a 15% deal-in chance.

Safe tile with +1 han and bad wait VS dangerous tile with good wait
For example, 235, with 5 being red. Cut the safe tile in this case.

Safe tile VS dangerous tile with +1 han
Think of a shape like 4567. The 7 is dora, and safe. The 4 is half-suji. It's usually better to cut the safe tile, but it can be worth it if your hand is 1-2 han and the tile is a non-suji 2/8 or safer. In terms of live suji, that's around 12, about a 6% deal-in chance.

Bad wait +2 han VS good wait
For example, 245 when you have a 234 sanshoku. If the good wait option is 1-2 han, take the bad wait, even if you have to cut a dangerous tile. If the good wait is 3+ han, take the good wait.

Against two riichis
Cut the safer tile in all cases.

Skipping Wins

All Last Comebacks

If you are in a situation where you're in riichi, and getting either ura or tsumo will let you escape fourth, then you can sometimes skip the ron if nobody is pushing.

If you have a ryanmen that's completely live (7 tiles remaining), the chance of tsumo is about the same as the chance of ura at turn 13. Before that, you can skip the ron. If your chance of hitting ura is lower due to having triplets in your hand, it goes more in favour of skipping.

With a kanchan, you should always take the win. The chance of tsumo equals the chance of ura at turn 5, but you can't tell if everyone is folding that early.

Open Hands

Say you have a 23 wait, where 1 is chanta + sanshoku + yakuhai, and 4 is only yakuhai. In this case, you can skip the win on the 4. The difference between 1 and 3 han is big. Of course, you have to take the win if you tsumo the 4.

If the difference is only from 1 han to 2 han, just take the win.

Dama Hands

Say you have a 23 wait, where 1 is junchan + sanshoku + pinfu, and 4 is only pinfu. You can skip calling ron on the 4. If you draw the 4, immediately call a furiten riichi.

If you were waiting for an upgrade to a kanchan in a shape like 35678, and drew the winning tile, it's also okay to take the three-sided furiten riichi.

All Last Techniques

These are things that primarily get used in South 4, or East 4 in an east-only game. In rare cases, they are relevant before that. AIs often hate it when you do some of these techniques, but they do see a lot of use from strong human players.

Making a Comeback Hand

超効率的に段位があがる 千羽黒乃の雀魂攻略大全 - Senba's Complete Guide to Mahjong Soul

Here are examples of hands that can make up the point difference between you and your rival. All of these are tsumo hands, assuming your rival is going to fold against you and not deal in. If you're one dora short, you can rely on ura dora. It's a roughly 30% chance. See also Skipping Wins.

If you're playing on Tenhou or are a Celestial, you should do everything you can to make a comeback. On Mahjong Soul, there is technically merit to taking a lesser win, as you do get 1 rank point per 1000 points you have. However, with fourth being an up to 250 rank point loss, making a comeback hand is basically worth 250,000 points. That's a lot of yakuman.

Also, keep in mind the seat order. If the difference is 1400, but you lose the tie breaker, you actually need a 1500+ point hand. Riichi sticks and honba will also reduce how many points you need. In S4-1 with one riichi stick leftover, a 1400 hand will make up a 2500 gap.

300/500 - 1400 vs non-dealer, 1600 vs dealer
Open Tanyao/Yakuhai nomi, Dama tsumo nomi

500/1000 - 2500 vs non-dealer, 3000 vs dealer
Riichi tsumo, Open Tanyao/Yakuhai dora 1, Open Chanta + Sanshoku

700/1300 - 3400 vs non-dealer, 4000 vs dealer
Riichi tsumo pinfu, Open Yakuhai dora 1 + terminal triplet + bad wait

1000/2000 - 5000 vs non-dealer, 6000 vs dealer
Riichi tsumo dora, Open Tanyao dora 2, Open Yakuhai + Honitsu

1300/2600 - 6500 vs non-dealer, 7800 vs dealer
Riichi tsumo pinfu dora 1, Riichi tsumo dora 1 + terminal triplet + bad wait

1600/3200 - 8000 vs non-dealer, 9600 vs dealer
Riichi tsumo chiitoitsu, Dama tanyao chiitoitsu tsumo

2000/3900 - 9900 vs non-dealer, 11900 vs dealer
Riichi tsumo tanyao iipeikou, Open Yakuhai dora 3

Mangan - 10000 vs non-dealer, 12000 vs dealer
Riichi tsumo tanyao pinfu dora 1, Open Yakuhai honitsu dora 2

Haneman - 15000 vs non-dealer, 18000 vs dealer
Riichi tsumo tanyao pinfu dora 2, Riichi tsumo chiitoitsu dora 2

Fourth place, the gap with third is 2700 points. So, we need a 700/1300 hand or better.

If we cut 1m as would be normal in such a hand, then draw 4p, we'll be riichi tsumo only, 500/1000. We'll have to hit ura dora. If we cut 4m instead, drawing 4p we're on a shanpon wait. The closed terminal of 9m is giving us 8 fu, and the shanpon wait will push us over to a 40 fu tsumo, getting us to 700/1300. If we draw 1p, we can even stay dama with iipeikou chanta, raising the chance of calling ron on third. Drawing 1m or north first clears the condition too.

[In case you don't see why 1m would be normal, in closed hands with 2 ryanmen and 2 pairs the normal choice is to cut a pair. In this case, cutting 1m means if we draw 2m we can still leave chanta open, giving it value over cutting the north pair.]

Assists

麻雀勝ち組の鳴きテクニック - The Calling Techniques of Winners

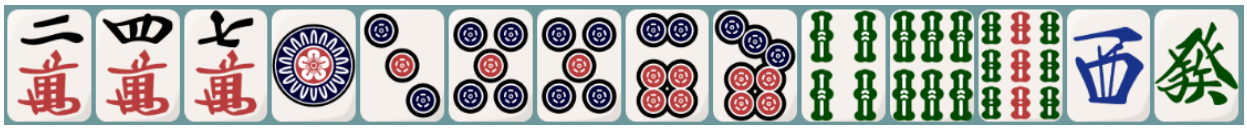
Providing Assistance
When you're already first with no reason to win the hand, and your own hand is bad, you can try to help your shimocha win instead, assuming they aren't the dealer.

Note that Celestials are incentivized to take second, so keep that in mind if you're playing on Mahjong Soul and your shimocha is a Celestial. They may ignore your attempts to help them avoid fourth in favour of aiming for second.

As for how to actually do so, it may seem as simple as cutting a bunch of middle tiles, but you should be a bit patient with it. The first row is still a bit early. Cut tiles they've already discarded, or tiles that will be dangerous against the dealer, while waiting for their hand to develop further.

On the second row, start by cutting tiles you have two of. That way, if they're not ready to call it yet, you can give them another chance later. After that, tiles you have suji of for the same reason, for example the 6 from a 69.

Your hand:



Shimocha's discards with a guest wind pon: 45m46s
Dealer's discards: 9s West North White

In this case, we can't cut the 9s or west, as they are safe tiles against the dealer. It's too early to try assisting, even though shimocha seems to be going for a flush. For now, we cut from 4m46s, tiles they absolutely don't want and could be dangerous against the dealer.

Then, in the second row, we cut 5p first and try to let shimocha call it. After that, we can try 6p.

Receiving Assistance
You can provide assistance even when someone doesn't know what you're doing, but receiving it is much harder. You should basically not attempt this below Houou / Throne. Tokujou and Jade players for the most part do not understand.

People will sometimes attempt to assist you on their own. If you see them cutting some random middle tiles for no reason, they may be trying to let you call. Switching to tanyao could be faster.

You can also beg your kamicha to help you out. The universal signal for requesting help is cutting the dora. If you have a floating dora tile, cut it early on. Showing that your hand is low value will make them more confident in assisting you.

It's a bit cheap, but you can also intentionally pause before cutting a tile near your final wait. Say you have a 344 shape, and you get tenpai. You can sit there for some seconds before cutting the 4 as a signal as to what your wait is. People who read the rhythm of discards might see your hesitation as trying to figure out a complex shape.

Sashikomi

Sashikomi is intentionally dealing into another player. When your own hand is bad, this can be more valuable than giving other players the chance to make a comeback. When you're super far ahead, this is easy to justify, but in tighter situations it can be difficult. Naturally, you shouldn't intentionally deal into the dealer in most cases.

There was a fun sashikomi moment in M-League recently (as of the time I'm writing this), reviewed on streams from both sides. We can use it as an example:
https://youtu.be/lSkyHlS7VII?t=110
He goes through his thought process. Basically, he can read based on the discards that Futoshi must have a manzu wait (suji counting), and the 9p cut makes it very likely it's a ryanmen. 9p is safe, and then he cut 3s from 233s, meaning he intentionally chose to not sakigiri and go for max ukeire, indicating a good wait. Shibukawa has all the manzu suji in his hand, so he can definitely deal in. But, he's 1-shanten too. At the same time, if he cuts the 9p, and fourth place calls riichi, he'll be in a bad spot, while dealing into Futoshi's 1-2 han hand will lock in third. Futoshi didn't call pon on the dora 2p, so he likely doesn't have them. Shibukawa opts to end the game ASAP rather than give fourth a chance to come back.

https://www.youtube.com/live/kjV8yXQ0w-k?si=L5UHtGuPHvmhM9yy&t=9168
"Well, 'I have a manzu wait' is written in my discards. A double musuji manzu is the single most dangerous thing. More than dangerous, it feels like it'll deal in. *reveals hands* Ahh, beautiful… A splendid sashikomi." He then reads through most of the same things observed in the other video.

Against Riichi
Imagine you're 9000 points ahead of second place. They need a mangan tsumo to get first. Fourth, 18k below you, calls riichi, and second place isn't folding. If they're a reasonable player, their hand likely has the chance to be a mangan tsumo. Should you try to deal into the riichi?

First, you should generally always avoid dealing into the ippatsu. After that, you can consider trying to deal in if you can survive dealing into a mangan without dropping placement. So, in our situation, yes, we should try to deal in. However, this is only if second place isn't folding against them. If second is folding, there's no need to take the risk.

Against Open Hands
Against open hands, it depends on how many dora you can see, and how many their hand could use. There are, usually, 7 dora total, but kans can increase it. If the opponent is a flush and the dora isn't in their suit, or they're tanyao and the dora is a guest wind or terminal, you can discount those dora.

If the open player having one third of the remaining usable dora would make you drop in placement upon dealing in, fold against them. For example, the player has an open tanyao with the red 5p. The dora is 8m. There's 6 remaining dora, they can use all of them. Having one third (2) of those would make their hand 7700 points. If your difference with second is that or less, don't try to deal into them.

If they need half of them or more, trying to deal in has value. The chance they have them all is low enough.

Shibori

Shibori is the opposite of assisting. You do whatever you can to reduce the chance of your shimocha calling tiles from you. The most common time to do this is when you're first with a good lead, your hand is bad, and your shimocha is the dealer in all last.

It's similar to folding from turn 1. You cut the middle tiles from your hand immediately and hoard tiles that will be safe later, the opposite of assisting. If the dealer makes a single call, switch to folding against them to minimize the chance of them calling a second time.

Another subtle note is that you should show the other players that you aren't going for a flush. If the middle tiles you cut are all from two suits, your kamicha might be wary about cutting the remaining suit, slowing them down. Anyone other than the dealer winning is good for you, so don't give them a reason to slow down.

Discard Reading

The more likely your opponents are to make mistakes, the less effective discard reading is. Thus, this is less and less useful the weaker your opponents are. At the highest levels, people will sometimes consciously make traps or bluffs through their discards. See also sakigiri.

Discard reading requires you to spend a lot of your attention watching your opponents. If you don't have the fundamentals down to the point of habit, spending this attention will result in you making a lot of basic mistakes. Focus on yourself before worrying about others. There's a reason this section is so far down.

Level 1 is thinking about what you're doing.
Level 2 is thinking about what your opponents are doing.
Level 3 is thinking about what your opponents think you're doing.

Discard reading is also something I don't personally do at all yet, so these are even more than usual just notes from the books.

Hand Speed

実戦でよく出る！読むだけで勝てる麻雀講義 - Yuusee's Mahjong Lectures

Normal Hands
The simplest way to estimate someone's hand speed is when they're following the standard tile discard order (or close to it) and then start cutting 3~7 tiles. If someone is cutting tiles according to the usual order, you don't need to be worried about them until they discard their first middle tile. Once they discard a second middle tile, the possibility of them calling riichi soon is high.

Note that there are variations in the initial tile discard order. Some people keep terminals over all honors, so something like cutting a dragon then a terminal isn't enough to be noteworthy unless you know the person and their usual order. But, all variations will view middle tiles highly.

This also covers people dropping blocks. If they cut a 11 pair, they're still not middle tiles, so don't mind it. If they cut a middle kanchan, like 35, it's time to get worried. Their next tedashi has a high chance of being tenpai if they're not already there.

All ryanmen drops are concerning. They're either telling you all their blocks are ryanmen or better, or they're going for high value.

Outside of middle tiles, cutting a dora 2~8 tile is cause for concern, as is cutting a dora yakuhai in the second row or a shape that could accept the dora.

High 1-shanten Chance: 2x middle tiles, tanyao dora, second row yakuhai dora, ryanmen drop

Continuing with the standard order, if someone goes against it, it can give some hints as to their starting hand's quality. If they cut terminals from their hand before guest winds, it can indicate shapes like 14 or 69, and their hand can be seen as slower than normal.

If they cut yakuhai before guest winds, that's a common pattern with very fast or pinfu hands. They're minimizing the chance of the yakuhai being called over the chance they pair it. In this case, they should be seen as faster than usual. Or they made a mistake or misclicked.

In this analysis, I didn't look at the order, just the composition, and you can see the number of middle tiles visible in the first row does scale the tenpai / 1-shanten chance.

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Some commentary on how you might use said speed reading. With a cheap open hand, you can keep safe tiles (sakigiri) early on if:

1. Your opponents look fast
2. Your remaining shapes are good enough

So, if you see people indicating fast hands (honors/terminals first, then cutting 3~7 tiles), sakigiri becomes a consideration even in the first row.

Flush Hands
Flush hands are fairly easy to understand. When you see them cut a live or once-cut honor, or a tile from their suit, it's indicating hand progression. Before they do that, you can mostly relax.

The number of calls also matters. With 0 or 1 calls, cutting a live or once-cut honor is worth noticing, while them cutting from their suit has a good chance of them being at least 1-shanten. If they cut a second tile from their suit, you should view them as tenpai.

If they have two or more calls, then cutting the honor is a high chance of 1-shanten or better. If they cut even one tile from their suit, you should view them as tenpai.

There's also the case where someone starts off by progressing normally, then switches to a flush due to drawing a bunch of one suit consecutively. If their initial discards look normal, but then they call a tile and cut a shape from a different suit, you may consider them 1-shanten for a flush. Especially if the shape they cut is a ryanmen. This case also has a higher than usual chance of it being a full flush rather than a half flush.

Chiitoitsu
Chiitoitsu discards can sometimes look like flush discards. The general discard order that makes chiitoitsu likely is:

1. There's an early 4~6 tile
2. They drop blocks, particularly ryanmen
3. Then, they start cutting the 1/2/8/9 tiles

If there's a suit missing in all of that, it also looks like a flush discard pool. If you can see all three suits in there, chiitoitsu is more likely. The indication of a chiitoitsu hand nearing tenpai is when they start cutting tiles that are good waits, like once-cut guest winds, or tiles that would be a suji wait for them. Once they start doing this, view them as 1-shanten.

However, chiitoitsu is a hard yaku to reach tenpai with. It's hard to really say when you should start respecting that they might be dama. Though, if they end up calling riichi, be wary of suji.

Atozuke
I'm not sure how much faith I put in this one specifically, but I'll note it down anyway.

If the very first tile they discard is a 2 or 8, it can indicate a slow starting hand, especially if they cut yakuhai tiles from their hand afterwards. The reason is their starting hand having a lot of yakuhai in it could lead to them cutting a floating 2/8 to leave the door open for any of them to pair, or perhaps draw flush tiles. In this case, you can largely ignore them until they make two calls. And, if those two calls don't include a yakuhai pon, there's a good chance they have a pair of one for their yaku.

Hand Shape

These will generally require you to watch the tedashis of your opponents. You don't have to remember all the tedashi tiles, just whether their most recent cut was tedashi or not.

Dropped Blocks
To notice these, you just have to notice a tedashi, then look at their last discard. If those two tiles form a block, they just dropped a block. It doesn't matter if the previous tile was tsumogiri or not.

Logically, if someone is cutting a block from their hand, such as a kanchan or ryanmen, it's probably their worst block. If you see them cut a 45 ryanmen, they probably have a better ryanmen like 23 or 78, or a block that gives them more value, such as sanshoku, iipeikou, or a dora. The chance of a good wait is increased, and the chance of yaku is increased. Not necessarily at the same time.

Blocks In Hand

When you notice tiles cut from their hand in certain orders, it can indicate some things. There's a lot of these and it's a bit hard to describe in words. Good luck. These cuts are all from the same suit, and can be mirrored to the other side, of course. In these, "later" means some tiles later, not immediately after.

If they cut a 5 early, then later cut a 1 from their hand, it indicates they have a block in the lower part of that suit. Shapes the 5 came out of include 1225, 1335, 1125, 1135. The 2 and 3 tiles in particular have a higher chance of being part of the wait. It could also be 1235, cut 5, draw 4 and slide from 123 to 234.

With an early 4 into a later 1, it's similar. That would be a 1224 or 1124 shape. The 1 could indicate they finished their 112 penchan, so the danger of 3 is a bit reduced and 2 is the concerning one.

If they cut a 5 early, then later cut a 2 from their hand, it's similar, but the 1 is the dangerous wait. These shapes include 1125, 1225, 2235, and 2334. 4 early, then 2 later just indicates they have a block somewhere in the 12345 area. These are shapes like 1124, 2244, and 2344.

If they cut a 9 early, then later cut an 8 from their hand, it indicates they had a 6 early on, and now likely have a block around the 6. The shape would be something like 689, then it upgraded to something like 568 or 668 or 6668 and led to the 8 being cut.

If they cut a 7, then an honor (even tsumogiri), then riichi on the 8, the chance of a 6-9 wait is high. If the 8 wasn't useful, they would have cut it and kept the honor as a safe tile. So, this pattern indicates they had a 7788 and cut the 7. When they drew the honor, it was a 788 shape. Either they're waiting on 6-9, or just drew it.

On the other hand, if they cut 7, then 8, then riichi on an honor, it indicates the 8 wasn't useful at the time. This indicates their wait is better than a 6-9, or their wait involves (aka) dora or yaku. Or chiitoitsu.

Cutting a 1 in the first discards, followed by a guest wind generally indicates they have a 4 in their hand. If you don't see a 4 come out later, they probably have a block involving it. It could also be them keeping the door open for a flush or something.

Kabe can lead to shape reads, too. If you see all the 3, and someone calls riichi with a 2, the likely shapes are 112 and 222 (trimming it to a pair). If the kabe isn't visible to the riichi player, 122 can be added. It could also be a safe tile.

Against Open Hands

鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms
See also:
Identifying Safe Tiles > Against Open Hands
Identifying Dangerous Tiles > Against Open Hands

When your opponent has an open hand, you can read a lot. But, there are situations where it's difficult to read anything. These situations, in particular:

1. They haven't cut an honor from their hand yet.
2. They haven't dropped a block.
3. You can't tell if they have 5 blocks.
4. They've mostly only cut from one suit.
5. They've only called once, especially if that call is a yakuhai
6. They have nothing giving value; their hand looks cheap

So, with that in mind, there are three cases that give very important information about an open hand.

1) **They cut a number tile, then an honor tile.**

In a closed hand, cutting the 3 from 334 or 233 to keep an honor tile is relatively normal. However, in an open hand, it's a big loss, preventing you from calling pon. So, it's rare (but not impossible) for an open hand to do that sort of sakigiri. Therefore, the tiles around the number tile are made safer.

This can also indicate that they have collected all their blocks. If they didn't have five blocks, they would want to keep the number tile to turn into a block. This is especially true if the tile is from 3~7.

2) **They drop a block.**

In this case as well, it's very likely they have 5 blocks if they've reached the point of dropping one, which is important for the third point.

Additionally, the number tile they cut from their hand before dropping the block is a safe zone, for the same reasons as before. People don't often sakigiri from 233 shapes in open hands. Going to 6 blocks sometimes has merit in closed hands, but in open hands, the cost of giving up a tile you can pon is high. But, it's less safe than the previous case, as there are more exception hands. (eg 334m11567p224s -> cut 3m -> draw 5s -> drop a block -> 3m area is dangerous)

It's possible to fake block drops. For example, you have 456, then draw the 7. You cut the 4. Then you draw the 6. You cut the 6 from your hand. Your hand hasn't really done anything, but people see you cutting a 46 kanchan.

3) They have enough blocks.

When they don't have enough blocks, there's a lot of possibilities in their hand. It's hard to make accurate reads. When the likelihood of them having 5 blocks is high, the number of good reads you can make also increases.

a) The number tiles that come out have more meaning.

Following the first point, if they did number tile -> honor tile, you can read that they now have all their blocks. The chance of them having floating tiles has gone down. The number tiles that come out after that are significant. Say a 7 comes out. That could mean…

1. They had a 778 / 667 shape and drew the 6. It's indicating a completed block.
2. They had a 788 shape. Another block completed, then they cut the 7 to get a pair.
3. They had a 778 shape. Another block completed, then they cut the 7 to wait on 6-9.
4. They had a 799 shape. They cut 7 to end on a shanpon wait involving the 9.
5. They had a 57 shape and drew the 4, then cut the 7 to wait on 3-6.
6. They had a 567 shape and slid down to 456 for sanshoku or something.
7. They had a 678 shape and drew the 7. They cut from their hand to confuse you.
8. It really was just a floating tile and they had some reason for their order.

You don't need to iterate through all that during the game. Just know the result: the area around that 7 should be considered dangerous. It's not guaranteed to be dangerous, but it becomes a candidate for what they could be waiting on.

b) Certain kuinobashi calls become very unlikely.

For example, they have an open hand, and you've noticed something that indicates they have all their blocks. They then call with 34p and discard 5s.

If they did not have all their blocks, that could be a 3445p5s shape. They called the 34p and cut the 5s to leave a 45p ryanmen. However, when they have all their blocks, the likelihood of tiles near the chii dealing in goes down. It would be a shape like 3445p35s. They call the chii then cut the 5s to look for a better shape later. They're not tenpai on the 45p ryanmen.

For that reason, if, after the 34p->5s call, they cut a tile connected to the 5s (like 3s or 7s), the danger of tiles near the chii returns.

お知らせ says this has very few exceptions, and is a trustworthy read. It reduces their potential ryanmen waits by 2~4, so if you're counting suji, this combined with point 1 can really narrow down what tiles might be dangerous.

c) Tiles they don't chii become safer.

If they didn't call chii on a 6 while not having enough blocks, they could still have a 4/5/7/8 floating tile, then connect to it and be waiting on a 6. But, with enough blocks, that case is quite diminished. The exceptions are high in cases where they have no pair.

Early Ryanmen Chii
場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull

In this book, it's stated that an early ryanmen chii called on 2/3/5/7/8 indicates an expensive hand. The general strategy is to not call away your good shapes, to call your bad shapes first. So, these calls could indicate a bunch of dora making them want to call anything. I imagine 4 and 6 are left out because those ryanmen calls could confirm tanyao or ittsuu, while 2/3/5/7/8 would only be confirming sanshoku.

AI Replay Reviews

渡辺太×麻雀AI「NAGA」AIが迷う何切る80 - 80 WWYDs Where AIs Disagree

There are many options out there for reviewing your games with AI. For free, there's Mortal with three types, or if you play on Mahjong Soul, Maka. NAGA is a paid service and has five different types. Each AI has its own playstyle and preferences. I don't have any data on Maka, but here's how the others compare. The NAGA values are from a league-style tournament with all of them where each played 100,000 games, while the Mortal values are from 1,000,000 games against the 4.0 version.

	NAGA					**Mortal**		
	カガシ	ニシキ	オメガ	ガンマ	ヒバカリ	4.1a	4.1b	4.1c
Win %	22.5%	21.3%	21.5%	20.3%	19.0%	21.1%	21.2%	21.5%
Riichi %	15.9%	19.6%	18.7%	16.7%	18.0%	18.3%	18.3%	19.4%
Call %	40.6%	33.6%	37.2%	33.9%	23.2%	29.5%	30.2%	31.5%
Deal-in	11.5%	10.8%	10.3%	10.1%	10.3%	12.1%	12.2%	12.7%
Average Value	6483	6970	6765	6799	7439	6415	6395	6511

Flush	4.52%	5.48%	5.63%	5.04%	5.20%	?	?	?
Dama	15.9%	11.5%	10.7%	15.3%	17.8%	?	?	?

Every NAGA version here outperforms the one that originally reached 10 dan on Tenhou, so each one is very strong, but they all have their own playstyles. The NAGA versions カガシ and オメガ, despite both being high call rate, only agree with each other about 85% of the time. Lean towards whichever AI plays most similarly to you, but looking at what the other types think can also be useful to understand different viewpoints.

If you just think, “I want to follow whichever is strongest!” then カガシ had the best performance in the all-NAGA league matches. Subjectively, Maka seems stronger than Mortal.

To reiterate a bit on how the various playstyles are all viable, here are five Tenhoui players, compared along the same statistics as the NAGA versions. The data is taken from Nodocchi. I tried picking out ones that roughly matched each NAGA type.

	Tenhoui				
	（≧▽≦）	タケオしゃん	藤井聡太	すずめ クレイジー	CLS
Win %	21.6%	21.4%	23.0%	20.3%	19.6%
Riichi %	17.3%	15.1%	18.9%	13.7%	16.4%
Call %	39.3%	33.6%	37.7%	30.6%	28.2%
Deal-in	11.7%	12.0%	11.7%	10.9%	11.3%
Average Value	6047	6106	6160	6380	6725
Flush	4.36%	4.88%	4.88%	5.2%	6.27%
Dama	11.2%	18.3%	9.6%	21.0%	17.34%

あなたの成績を爆下げする致命的ミス3選 - Three Fatal Mistakes

In this video, it’s shown that NAGA will switch to agreeing with you if you make a different judgement than it. For example, if you choose to dama a hand that NAGA sees as 100% riichi, the next turn it won’t keep suggesting riichi. This is presumably to avoid stacking up your mistake count, but in my experience Maka will keep suggesting its own opinion. If you dama, Maka will tell you to riichi every turn, and if you push, Maka will tell you to fold every turn. If you’re using NAGA, this is something to be conscious of. I haven’t personally used NAGA yet to confirm if this is how it works, but if yoteru says it it’s probably true.

The main topic of the video was “My AI grades are good, so why am I not winning?” and the three mistakes were:

1. Dealing in and dropping from second in South 4 - See South 4
2. Staying dama with hands that really should be riichi hands - See Dama Judgement
3. Frivolously pushing (e.g. cutting live honors against an early riichi) - See Folding Methods

By the way, in the “80 WWYDs Where AIs Disagree” book, the triple-Tenhoui ないおトン says that if someone has a high grade, you can say their strength is similar to the AI, but if it’s low, you can’t necessarily say that they’re weak. So, don’t assume that having the highest grade in the game means you played the best. The others might have styles that are strong, but different from the AI.

Appealing to AI

Here are some notes on the behaviours of AI. Mimicking these will pad out your grades / match percentages. These are mainly minor things that different AIs disagree on. If you don’t have a personal opinion on what’s best, matching the AI you use is fine.

Maka

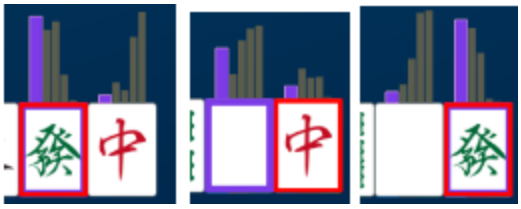
Maka seems quite algorithmic. These basically never change.

- Dragon order matches the mathematically optimal one
- The 9 in a 69 is basically the same as a guest, but it prefers cutting the guest
- All once-cut yakuhai are worse than all live yakuhai
- Once-cut yakuhai are still better than terminals
- Double wind > 2/8 > once-cut double wind
- The 8 in 58 is slightly better than a live yakuhai
- Twice cut yakuhai vs twice cut guest: Cut yakuhai
- Cut once-cut guests before live guests
- In the south (or west) rounds, cut east as the first guest wind

NAGA

NAGA’s decisions change a lot, but these are some common patterns I’ve observed. After the initial batch of replays, I moved to only using Kagashi, Omega, and Nishiki, so I won’t be too informed on the other two.

- Dragon order changes based on version. Omega, Gamma and Nishiki tend to cut G>W>R, while Kagashi and Hibakari tend to cut W>R>G. Omega and Kagashi tend to be very opinionated on this, so going against it could give you a “bad move” mark.



- The 9 in a 69 is cut before guest wind. 1 in 146 is also cut first, but 1 in 1468 is not. 1 in 145 is cut first by Kagashi, not by Omega. The 1 in 134 is kept if you don't have a pair, and is better than floating terminals even if you do (turns a 2 draw into a 4 draw basically).
    - 19: Cut 1 when they are equal (dora chance).
- Once-cut self wind is better than live yakuhai
- Omega cuts round wind before once-cut yakuhai, but the other versions do not
- Once-cut yakuhai is usually cut before a terminal, particularly by Omega (Omega keeps once-cut self wind over terminal), even if that terminal is like the 9 in 69. Kagashi / Nishiki often see them as equivalent
- 2/8 is cut before live yakuhai in some situations, but I don't have a good explanation of when. When there's some chance of honitsu, when you have 3 different yakuhai, when you already have blocks…

East Only Games

東風戦だけ勝てない人へ。- For people who can't win in East Only games

You don't actually need to play east only games (tonpuu) any differently than south games. All the same push/pull skills, calling judgements, and so on you developed in south games can be used the same way in east only. Some people have the idea that you have to maximize your speed and call everything, but it's not really true. Compare the triple-tenhoui's south games account with his east only account. The call rate is basically the same.

Think of east only games as playing a hanchan where you enter the south round with the points relatively even. You don't really change your play in that case during South 1 and even South 2, so you also don't need to change your play during East 1 and East 2 of an east only game.

If you need practice with all last situations, east only games might be a good training ground.

There are four things you should be thinking about during tight point situations like this.

1. How many points do I need to win in this round? (to take first, or escape last)
2. How many points am I okay with dealing into?
3. Against a riichi: Is it okay if I deal into a mangan here?
4. If I'm not tenpai at the end of the round, will I drop in placement?

Keep those in mind during your east only games and otherwise just play the way you would in the south rounds of a hanchan game.

Three-Player (Sanma)

データで勝つ三人麻雀 - Win in Sanma with Data
鬼打ち天鳳位の三人麻雀 勝利へのプロセス - Oshirase's Process of Learning Sanma

I might expand this section later. For now, just a few quick notes:

- Dama judgement is the same. Being first to riichi is powerful.
- Keiten is not worth pushing for.
- As players go from 4d to 7d, their riichi rate goes up, their call rate goes down, and their **average value goes down**. Riichi rate and call rate both approach 25%. Deal-in rate goes below 15%.
- Without chii, calling doesn't increase your speed as much. You shouldn't really do it at 3-shanten.
- Don't force yaku. I'm looking at you, honitsu. Toitoi also seems to be a problem. You can start thinking about chiitoitsu with four pairs. Riichi is still the strongest yaku.
- You should still be folding. There are only 12 suji. If someone is in riichi with two nukidora, they are practically guaranteed to have a mangan, and likely a haneman.

Top Player YouTube Channels

This isn't an exhaustive list. You can watch these people to see how they play, and where your choices differ. Just keep in mind that Celestials play for second rather than for avoiding fourth. For people playing on Mahjong Soul, look for 王座の間 in the titles or thumbnails for gameplay videos. 段位戦 is another common word used.

藤井聡太 - Triple Tenhoui, Celestial level 13, M-Leaguer. The only player to reach Tenhoui in both 4- and 3-player. Most recent videos are reviews of his M-League games, but if you go back far enough you'll find live gameplay VoDs.
（≧▽≦） - Tenhoui, Celestial level 9. Very high call rate and lots of stream VoDs to go through.
gousi - Tenhoui, Celestial level 2. Not really active recently, especially for live ranking gameplay.
タケオしゃん - Tenhoui, Celestial (but seems to have reset his account or something?). Very noisy stream layout.
ヨーテル - Tenhoui, Celestial. Mainly focused on East Only games recently, and older VoDs are locked behind membership.
お知らせ - Tenhoui, Celestial. Mainly focused on 3-player games recently, but there's plenty of 6-player (六麻) games in there.
渋川式 - Celestial, M-Leaguer. Recommended by ヨーテル as someone to learn from
ゆうせー - Peak 10d, Celestial. Well-regarded for instructional content. Goes for honitsu a lot due to trying to learn from LuckyJ.
千羽 黒乃 - Peak 9d, Celestial level 5. Quite popular
平澤元気 - Tenhou 8d? Saint 3. Quite popular

Book List

Books I Have

Most of these books have been referenced earlier in the doc. But, this has them all in one place, with some brief thoughts on each book. The English names aren't official translations, just my casual interpretation of the name.

Overall

令和版 現代麻雀技術論 - Modern Mahjong Strategy

- This covers everything, in great detail, but you have to put in the work to interpret it. If you're only buying one mahjong book in your entire life, this is probably the one to go for.

場況を読んで勝率アップ！　麻雀・天鳳位の押し引き - Tenhoui's Push / Pull

- I like this book a lot. Yoteru's thinking is something I can vibe with. I'm normally a person who doesn't like wibbly things like discard reading, but this book changed my mind, and almost all the situations chosen are quite interesting, each one from extremely high level matches.

鬼打ち天鳳位の麻雀メカニズム - Oshirase's Mahjong Mechanisms

- Quite detailed and high level, but I align less with oshirase than I do with yoteru. Still, I learned a bunch from it, and you can see plenty of notes taken from it throughout this doc. It's written as more of a comprehensive guide, while yoteru teaches through exceptional situations. It's also interesting to see the perspective of a player with a totally different playstyle.

超効率的に段位があがる 千羽黒乃の雀魂攻略大全 - Senba's Complete Guide to Mahjong Soul

- If a beginner knew Japanese and wanted a first book, I would recommend this to them over Riichi Book 1. I like the organization a lot. But, not much in here for strong players.

渡辺太×麻雀AI「NAGA」AIが迷う何切る80 - 80 WWYDs Where AIs Disagree

- All the data about the NAGA versions is quite interesting, and the high-level thought behind all the situations is nice to see, along with the author's interpretation of the opposing viewpoints.

実戦でよく出る！読むだけで勝てる麻雀講義 - Yuusee's Mahjong Lectures

- Extremely varied content level. It's presented in a format of answering questions (interestingly, one of the questions is from oshirase, from before oshirase became a tenhoui). I would look at the table of contents and see how many of those questions you also have. Strangely, not really anything about calling in here.

ゼロ秒思考の麻雀 - Mahjong with Zero Seconds of Thought

- When it was initially released, it was very groundbreaking, with things like toitoi dash and "the ultimate pinfu dama" changing how people played. But, I think there's not much reason to read this one in modern times. Other books cover what it has and more.

ゆーみんの現代麻雀が最速で強くなる本 - Yuumin's Quickly-Become-Good-At-Modern-Mahjong Book

- Mostly aimed at a lower level of player than I am, so most of it wasn't too useful. But, the mental section at the start and the techniques for reading physical tells in IRL Mahjong are pretty unique.

Tile Efficiency

ウザク式麻雀学習 牌効率 - Tile Efficiency

- Extremely thorough explanations of all the tile efficiency principles. I would consider this the textbook for tile efficiency, and then WWYD 300/301 as the exam.

これだけで勝てる! 麻雀の基本形80 - 80 Basic Shapes

- I think this book is outdated now that the above book exists.

麻雀 傑作「何切る」300選 - WWYD 300

- I found this book easier than WWYD 301, and also with worse organization. They will tell you a concept to help you with some shape, and then immediately show you exceptions instead of giving you questions to reinforce the new concept. Still, useful.

麻雀 定石「何切る」301選 - WWYD 301

- These questions are quite difficult. They really put your tile efficiency to the test.

牌効率が自然と身につく！　麻雀・何切らない問題 - What Don't You Discard Questions

- A lower level than the 300/301 books, with longer explanations. The concept of a "what don't you discard?" book amused me too much when I saw it, so I bought it.

Specialized

麻雀勝ち組の鳴きテクニック - The Calling Techniques of Winners

- Extremely specialized calling problems. Many of them are in South 4, and many of those are "Win = First" situations.

現代麻雀 手作りと押し引きの鉄戦術 - Iron Tactics for Hand Building & Push / Pull

- I don't even remember reading this one

令和版 現代麻雀 押し引きの教科書 - (Reiwa Edition) Modern Push / Pull Textbook

- If Modern Mahjong Strategy is too much for you, this is a fine stepping stone. It includes calling and dama in the push / pull umbrella. For modern players, some of them are quite obvious.

Sanma

I haven't fully read these ones yet. They're for later.

データで勝つ三人麻雀 - Win in Sanma with Data

鬼打ち天鳳位の三人麻雀 勝利へのプロセス - Oshirase's Process of Learning Sanma

Books I Want

Shipping to Canada is quite expensive, and I like physical mahjong books, so I don't order unless I have a bunch I currently want. Here's the current list:

ウザク式麻雀学習 何切る 金 - WWYD Golden

- Can never have too much tile efficiency practice

上級者だけが知っている麻雀戦術論 - Tactics Only Strong Players Know

捨て牌読みの傾向と対策 - Discard Reading: Trends and Countermeasures

- Since I liked the yoteru book I read so much, I wanna read the others too

点数状況によって変わる強者の選択 - How the Point Situation Affects the Decisions of Strong Players

- This is a lacking area both for me and this doc, and yoteru strongly recommended it.

鉄押しの条件 —3人の天鳳位が出す究極の結論 - Must-Push Situations: 3 Tenhouis' Conclusions

- Another book recommended by yoteru. I'm fully won over at this point. Hard title to put into English though, especially without having it fall onto a second line.

If you'd like to support my mahjong book addiction, you can support me on ko-fi: https://ko-fi.com/erzzy