Aviary's Riichi Statistics Cheat Sheet

1a. Deal-in rates vs Tenpai opponent

Suji Passed	456	37	28	½ Suji 456 19	Suji 37 Suji 28		Suji 456 Suji 19	Fresh Yakuhai	Once cut Yakuhai
4		-30	0%		-10% -50%				
8	14%	10%	9%	8%	6%	4%	2%	5%	3%
12		+6	6%			+30%	+250%		

- Dora +50% vs riichi and +80% vs open. Dorasoba +30% to riichi and +50% to open. Dora ± 2 is 10% more dangerous.
- One chance is -50% early game, -75% mid game, and -90% late game

1b. Relative Danger - First Row Sotogawa

					50 0.				
Sotogawa	1 Danger	2	3	4	5	6	7	8	9
1 Discard		95%	100%	65%	110%	110%	95%	105%	105%
2	40%		90%	75%	65%	120%	110%	95%	105%
3	55%	40%		90%	80%	60%	125%	105%	95%
4	35%	55%	60%		95%	85%	55%	130%	115%
5	130%	40%	65%	90%		90%	60%	40%	135%

- First simple is 20% more effective, second row is 20% less effective
- 1c Relative Danger Sotogawa Joints (X. V tedashi in discards)

1c. Relative Danger - Sotogawa Joints (X, Y tedashi in discards)										
Joint	1 Danger	2	3	4	5	6	7	8	9	
(1, 1)		110%	100%	65%	105%	100%	90%	100%	100%	
(2, 2)	25%		105%	60%	50%	120%	85%	80%	105%	
(3, 3)	25%	20%		75%	50%	55%	110%	75%	80%	
(4, 4)	25%	40%	40%		70%	60%	55%	120%	100%	
(5, 5)	130%	35%	45%	60%		50%	35%	45%	100%	
(1, 2)			115%	55%	65%	125%	85%	90%	105%	
(2, 1)			90%	65%	55%	115%	95%	85%	110%	
(2, 4)	20%		65%		60%	90%	50%	100%	95%	
(4, 2)	55%		60%		80%	90%	45%	130%	115%	
(1, 3)		55%		65%	80%	55%	105%	95%	85%	
(3, 1)		45%		85%	80%	50%	125%	110%	85%	
(3, 5)	50%	25%		70%		60%	90%	45%	105%	
(5, 3)	95%	35%		70%		75%	65%	35%	130%	
(2, 3)	35%			95%	55%	60%	130%	75%	85%	
(3, 2)	60%			105%	50%	60%	130%	80%	90%	
(3, 4)	25%	55%			90%	50%	60%	125%	85%	
(4, 3)	40%	85%			100%	50%	45%	115%	80%	
(4, 5)	45%	25%	115%			105%	45%	50%	105%	
(5, 4)	35%	45%	50%			90%	35%	40%	155%	
(1, 9)		90%	100%	60%	110%	75%	85%	100%		
(1, 7)		95%	125%	25%	80%	95%		45%	55%	
(7, 1)		105%	110%	25%	80%	85%		45%	50%	
(2, 8)	45%		85%	95%	30%	90%	100%		55%	
(1, 6)		115%	30%	40%	100%		50%	65%	30%	
(6, 1)		120%	40%	40%	95%		55%	55%	30%	
(2, 7)	35%		115%	25%	40%	105%		50%	60%	
(7, 2)	60%		120%	40%	35%	105%		45%	55%	
(1, 4)		55%	50%		90%	80%	50%	120%	105%	
(4, 1)		60%	60%		100%	85%	45%	135%	110%	
(2, 5)	40%		55%	45%		90%	60%	40%	125%	
(5, 2)	90%		50%	60%		90%	60%	35%	135%	
(3, 6)	50%	45%		60%	55%		75%	65%	30%	
(6, 3)	60%	65%		55%	60%		60%	55%	30%	

1d. Relative Danger -1st Row Riichi vs 3rd Row Riichi

1st Row	1 Danger	2	3	4	5	6	7	8	9
1 Riichi		115%	105%	60%	80%	95%	90%	85%	95%
2	155%		70%	90%	55%	85%	90%	90%	100%
3	115%	70%		85%	80%	50%	95%	95%	70%
4	30%	100%	60%		80%	80%	70%	85%	100%
5	105%	75%	80%	75%		75%	85%	70%	100%
3rd Row	1 Danger	2	3	4	5	6	7	8	9
1 Riichi		160%	185%	65%	130%	110%	75%	120%	105%
2	205%		145%	135%	85%	130%	105%	105%	135%
3	155%	140%		135%	120%	75%	110%	120%	90%
4	15%	140%	120%		130%	105%	75%	145%	105%
5	140%	55%	110%	115%		120%	135%	45%	155%

1e Relative Danger - Riichi Joint (Riichi on V X in discards

Joint	1 Danger	2	3	4	5	6	7	8	9
(1, 1)		130%	120%	65%	90%	95%	90%	90%	1009
(2, 2)	175%		90%	115%	65%	95%	95%	90%	100
(3, 3)	135%	100%		100%	100%	60%	100%	95%	80
4, 4)	25%	120%	70%		100%	80%	75%	105%	95
5, 5)	115%	70%	95%	90%		95%	95%	65%	115
(1, 2)			110%	85%	85%	110%	100%	120%	105
(2, 1)			90%	55%	55%	110%	95%	90%	80
(2, 4)			110%		80%	130%	80%	120%	120
(4, 2)	85%		80%		85%	75%	35%	135%	100
(1, 3)		135%		55%	140%	60%	90%	115%	80
(3, 1)		30%		100%	70%	65%	140%	90%	120
3, 5)	60%	40%		110%		75%	160%	60%	145
(5, 3)	250%	70%		130%		80%	75%	30%	110
2, 3)	105%			140%	75%	90%	140%	80%	80
3, 2)	150%			135%	35%	60%	125%	70%	120
(3, 4)	20%	125%			155%	65%	85%	135%	100
(4, 3)	70%	225%			155%	55%	40%	120%	115
4, 5)	50%	35%	265%			270%	75%	80%	255
5, 4)	30%	130%	90%			75%	55%	60%	70
1, 7)		80%	100%	35%	100%	105%		110%	135
7, 1)		145%	120%	25%	80%	65%		30%	30
2, 8)	45%		65%	60%	30%	115%	85%		175
[1, 9)		85%	75%	55%	105%	65%	110%	165%	
[1, 6)		90%	70%	55%	110%		65%	125%	25
(6, 1)		190%	95%	30%	90%		45%	65%	40
[2, 7]	30%		85%	35%	60%	110%		90%	150
(7, 2)	190%		110%	85%	40%	65%		50%	50
1, 4)		105%	70%		90%	85%	75%	90%	85
4, 1)		45%	125%		75%	75%	30%	85%	7(
2, 5)	55%		65%	65%		105%	100%	50%	135
5, 2)	290%		80%	125%		100%	65%	35%	150
(3, 6)	55%	25%		60%	75%		75%	120%	20
(6, 3)	135%	110%		85%	70%		40%	30%	20

2a. Riichi/Dama Wait Winrate

	Turn 8 Riichi Winrate Ranking										
Shape	Wait	Riichi	Dama	Shape	Wait	Riichi	Dama				
Sanmen	147	66%	72%	Trap	4,6	50%	41%				
Sanmen	258	65%	72%	Shanpon	1,9 + 2-8	48%	43%				
Shanpon	Z + Z	59%	52%	Z Tanki	Fresh	48%	40%				
Ryanmen	14	57%	67%	Single	1,9	47%	48%				
Trap	1,9	57%	48%	Trap	3,7	47%	43%				
Z Tanki	1 out	55%	54%	Trap	5	46%	39%				
Shanpon	Z + 1,9	55%	48%	Z Tanki	2 out	44%	39%				
Ryanmen	25	54%	63%	Single	2,8	41%	45%				
Shanpon	1,9 + 1,9	53%	54%	Shanpon	2-8 + 2-8	41%	44%				
Shanpon	Z + 2-8	52%	46%	Single	3,7	38%	43%				
Ryanmen	36	52%	62%	Single	4,6	36%	41%				
Trap	2,8	52%	45%	Single	5	33%	39%				

- -10% for ryanmen dora wait, -30% for single dora wait
- Trap wait, single 123 +25%, single 45 +45%. Shanpon +10%
- Furiten -35% for sanmenchan, -40% for ryanmen

2b. Riichi Average Points

	J		
w/o Riichi	Riichi size	Dealer	ND
(Riichi nomi)	1 han 40 fu	4300	2900
1 han 30 fu	2 han 30 fu	5800	3900
1 han 40 fu	2 han 40 fu	7600	5100
2 han 30 fu	3 han 30 fu	9700	6500
2 han 40 fu	3 han 40 fu	11200	7500
3 han 30 fu	4 han 30 fu	13700	9100
3 han 40 fu	4 han 40 fu	14000	9200
3 han 50 fu	4 han 50 fu	13800	9200
4 han 40 fu	5 han	16950	11300
5 han	6 han	19650	13100
6 han	7 han	22650	15100

2c. Oppoonent Ron Scores

	Avg I	Dealer Ron	scores by	Turn		Avg Non-Dealer Riichi Ron scores by Dealin Tile						
Turn	Ippatsu	Riichi	Tanyao	Yakuhai	Honitsu	19	28	34567	Honor	Dora	Dora +-2	
4	10400	7100	4600	4500	9800	4800	5000	5400	5900	7600	5800	
8	10900	7600	4800	4900	9900		Avg Non-D	ealer Ron s	cores by D	ora in calls		
12	11600	8400	5100	5500	10300	Yaku	0	1	2	3	Avg	
	Avg No	n-Dealer R	on scores b	y Turn		Tanyao	3600	4900	6700	9400	4100	
Turn	Ippatsu	Riichi	Tanyao	Yakuhai	Honitsu	Yakuhai	3900	4900	6600	10100	4300	
4	7100	5000	3100	2700	6500	А	vg Non-De	aler Ron sc	ores by Do	ra discarde	d	
8	7600	5400	3100	3000	6700	Thrown	Ippatsu	Riichi	Tanyao	Yakuhai	Honitsu	
12	8000	6000	3500	3500	6900	0	7700	5400	3700	3400	7000	
	Avera	age Oikake	Riichi (Turr	n 10)		1	7300	5100	2800	2800	6600	
Who	Good wait	Width	Ron score	Tsumo	Win %	2	7200	4800	2500	2600	6600	
D vs ND	66.8%	6.56	9500	12300	40.1%	3	7500	4800	2400	2700	6700	
ND vs ND	68.4%	6.62	6700	8600	39.5%	4	5200	4300	2200	2500	6300	
ND vs D	72.1%	6.76	7000	8900	41.7%							

2d. Betaori Cost

Turn	vs 0 F	Riichi		vs 1 Riichi			vs 2 Riichi		vs 3 Riichi		
Self	Dealer	ND	Dealer	ND	ND	Dealer	ND	ND	Dealer	ND	
Against	-	-	ND	ND	Dealer	ND ND	ND ND	D ND	3x ND	D ND ND	
8	-1600	-1200	-1900	-1100	-1700	-1700	-900	-1300	-1600	-800	
12	-1500	-1200	-1800	-1200	-1600	-1800	-1100	-1400	-1700	-900	
16	-1300	-1200	-1400	-1300	-1400	-1700	-1500	-1600	-2300	-1900	
Turn	0 other	s open	1 other open 2			others ope	n	3	others ope	n	
Self	Dealer	ND	Dealer	ND	ND	Dealer	ND	ND	Dealer	ND	
Against	-	-	ND	ND	Dealer	ND ND	ND ND	D ND	3x ND	D ND ND	
8	-1600	-1200	-1300	-1000	-1100	-1100	-800	-900	-900	-700	
12	-1600	-1200	-1400	-1100	-1200	-1300	-900	-1100	-1100	-900	
16	-1300	-1200	-1400	-1200	-1200	-1500	-1200	-1300	-1400	-1300	

2e. Oikake Riichi Winrate

Turn	Sa	nmencha	n+		Ryanmer)		Single		Honor			
Turn	Win	Draw	Dealin	Win	Draw	Dealin	Win	Draw	Dealin	Win	Draw	Dealin	
8	56%	3%	12%	48%	5%	16%	32%	10%	21%	43%	5%	22%	
12	47%	11%	12%	40%	14%	14%	29%	19%	18%	36%	13%	19%	
16	33%	47%	6%	22%	50%	7%	14%	51%	10%	18%	59%	8%	

2f. Riichi/Dama and Push/Fold Policy

	•			•	•			
Posit	tive EV Dan	naten		Push Musuji in 1 shanten				
Wait	Han/Fu	Dama	S	Situation	Push Musuji			
Ryanmen	3/40	After T12	D	v ND	Early game, good shape, 1 han			
Ryanmen	3/50	Always	D	v ND	Early game, bad shape, 2 han			
Ryanmen	4/30, 5	After T8	D	v ND	Mid game, good shape, 3 han			
Ryanmen	6+	Always	N	D v ND	Early game, good shape, 3 han			
Kanchan	3/40+	Always	N	D v ND	Mid game, good shape, 4 han			
Honor	6+	Always	N	DvD	Early game, good shape, 4 han			

Also yakunashi dama 1 Han middle tile bad wait in the mid-late game.

	Push vs 1 Riichi (Open/Oikake)	Pus	h vs 2 Riichi (Open/Oikake)
Wait	Push	Wait	Push
Ryanmen	All ex. 1 Han ND vs D	Ryanmen	1 Han as D
Kanchan	1 Han as D	Ryanmen	2 Han ND vs ND ND
Kanchan	2 Han as ND vs ND	Ryanmen	3 Han ND vs ND D
Kanchan	3 Han as ND vs D	Kanchan	2 Han as D
Honor	1 Han as D	Kanchan	4 Han as ND vs ND ND
Honor	2 Han as ND	Kanchan	5 Han as ND vs ND D

• EV assumes only push/fold. In marginal situations, mawashi may be superior.

3a. Open Tenpai Chance

	Tei	npai char	nce		Relative ten	Relative tenpai chance at turn 8, 1 call						
Calls	0	0 1 2 3		3	Has called Kan	123% Right after Pair drop	72					
Turn 4	urn 4 1% 7% 28% 77%		Has discarded Dora	141% Right after Kanchan drop	87							
8	4%	27%	53%	88%	Just called on Turn 8	121% Right after Ryanmen drop	87					
12	12 12%		69%	92%	Right After Honor Tedashi	64% Called ryanmen (Tanyao)	103					
16	19%	55%	73%	91%	Right After Number Tedashi	91% Called pon (Tanyao)	96					
• H	Innitsu	is a bit	slower	-	Tsumogiri 3 times	143% Called kanchan (Tanyao)	88					
		lown th	•		Tsumogiri 6 times	143% Called dora pon (Tanyao)	60					
Р	uning u	OWII LII	cavera	gc	•							

3b. Average Risk of Riichi

Average Chance to Riichi within 3 Turns (per closed opponent)												
	Turn 0	1	2	3	4	5	6	7	8	9	1	
	1%	2%	3%	5%	6%	8%	9%	11%	11%	12%	119	

3c. Turn 6 Speed Reading

	Turn 6 Speed Reading (Relative tenpai chance)											
# sui	ts of simple	e tiles	# suit	ts of middle	e tiles	First Discard						
1 simple	2 simple	3 simple	1 middle	2 middle	3 middle	Yakuhai	Guest	Number				
82%	114%	135%	107%	132%	139%	134%	109%	97%				

- Average different suit discards of simple tiles: T4 (1 suit), T8 (2 suits), T12 (3 suits)
- 2nd Discard Yakuhai + 10%, Number tile -> Guest wind -10%

3d. Closed & Open Win Chance Projection

	Chance o	of winning	a closed	hand		Open I	nand winr	ate (or st	Open hand winrate (or still closed but will call)						
Shanten			Turn			Shanten	Turn								
Silalitell	4	6	8	10	12	Shanten	4	6	8	10	12				
4+	3%	2%	1%	1%	0%	4+	8%	5%	0%	0%	0%				
3 Kan	3%	2%	1%	1%	0%	3 Kan	12%	7%	4%	6%	0%				
3 Perfect	4%	3%	1%	0%	0%	3 Perfect	13%	6%	5%	6%	0%				
3 Sticky	8%	4%	3%	1%	0%	3 Sticky	18%	13%	4%	1%	2%				
2 Kan	8%	5%	3%	2%	1%	2 Kan	23%	17%	12%	7%	3%				
2 Perfect	12%	8%	6%	4%	1%	2 Perfect	26%	19%	15%	10%	5%				
2 Sticky	18%	12%	8%	5%	2%	2 Sticky	30%	22%	15%	8%	4%				
1 Kan	21%	16%	12%	9%	5%	1 Kan	36%	28%	22%	17%	11%				
1 Perfect	32%	25%	20%	15%	11%	1 Perfect	45%	38%	29%	24%	17%				
1 Sticky	40%	34%	26%	19%	13%	1 Sticky	48%	39%	32%	23%	14%				
0 Bad	51%	42%	37%	32%	28%	0 Bad	55%	50%	42%	37%	30%				
0 Good	66%	66%	58%	52%	49%	0 Good	72%	65%	59%	52%	45%				
0 V good	80%	62%	65%	59%	52%	0 V good	84%	75%	73%	67%	56%				

• Based on average 1 other player open. If 0 opponents open, +10%. If 2 open, -10%

3e. Chance to complete Yakuhai Pair

	Dragon or Round Wind, chance to eventually get								
T	Clo	sed	Ato	zuke	Atozuke, terminal				
Turn	Fresh	1 out	Fresh	1 out	Fresh	1 out			
2	74%	69%	66%	58%	64%	62%			
4	64%	63%	56%	54%	54%	53%			
6	52%	57%	46%	51%	43%	48%			
8	42%	51%	38%	47%	35%	44%			
10	34%	46%	31%	44%	29%	41%			
12	26%	40%	24%	40%	22%	37%			

Relative chance to eventua	Relative chance to eventually get								
Seat wind, Fresh	1179								
Seat wind, 1 out	1019								
Double wind, Fresh	949								
Double wind, 1 out	919								
Dora Yakuhai, Fresh	669								
Seat wind, 1 out Double wind, Fresh Double wind, 1 out Dora Yakuhai, Fresh Dora Yakuhai, 1 out									
w.r.t. Dragon Fresh/	1 out								

w.r.t. Dragon Fresh/1 ou respectively

3f. Calling Policy

Situation	1-shanten Calling Policy
Mentanpin, Perfect	T12
Tanyao nomi, Perfect	T10
Tanyao dora 1, Perfect	T10
Tanyao dora 2, Perfect	Т6
Tanyao nomi, Ryanmen-Kanchan	Bad side: T5, Good side: T12
Sanshoku nomi, Ryanmen-Kanchan	Bad side: T8, Good side: T12

4a. Chance to Finish 4th in All Last

Current	Position		3rd		4th				
l ar	n	Dealer	ND, ND 4th	ND, D 4th	Dealer	ND, ND 3rd	ND, D 3rd		
	0	51%	35%	30%	63%	58%	42%		
Score gap (at least X)	1000	43%	33%	27%	67%	61%	52%		
re g eas	2000	34%	28%	25%	70%	68%	61%		
Score (at lea	3000	26%	22%	22%	73%	74%	69%		
	4000	20%	18%	18%	77%	79%	76%		

4b. Utility (Value of winning 8000 / dealing in 8000)

1st Pla	ce		2nd/3rd I	Place		4th Place				
Situation	Round	Ratio	Situation	Round	Ratio	Situation	Round	Ratio		
From mainte	E3	0.92	Class raints	E3	0.86	لم مناما ما خنام ۸	E3	1.08		
Even points, 250-250-250-250	S1	0.89	Close points, 250-300-250-200	S1	0.80	A bit behind, 200-300-250-250	S1	1.39		
230-230-230	S3	0.76		S3	0.57	200-300-230-230	S3	2.94		
Cmall load	E3	0.69	Distant 1st & 4th,	E3	0.85	Far babind	E3	1.53		
Small lead, 300-200-250-250	S1	0.51	250-250-400-100	S1	0.78	Far behind, 100,300,300,300	S1	1.91		
300 200 230 230	S3	0.28	230 230 400 100	S3	0.68	100,300,300,300	S3	8.79		
Dialood	E3	0.39	and shooting 1st	E3	0.86	10k hart aloog 2md	E3	1.18		
Big lead, 400-200-200-200	S1	0.33	2nd chasing 1st, 350-400-100-150	S1	0.87	10k but close 3rd, 100-150-400-350	S1	1.43		
400 200 200 200	S3	0.08	330 400 100 130	S3	1.73	100 130 400 330	S3	3.68		
40k but aloso 2nd	E3	0.45	and avaiding last	E3	1.16	lust 1000 hehind	E3	1.01		
40k but close 2nd, 400-350-150-100	S1	0.50	3rd avoiding last, 150-100-350-400	S1	0.96		S1	1.01		
400 330 130 100	S3	0.34		S3	0.56		S3	1.09		

1f. Riichi & Open Wait Distribution

Waits on		Dis	tribution o	f Shapes, Ri	ichi		Waits on	Distribution of Shapes, Open					
1	23456	23	Tanki	Shanpon			1	23456	23	Tanki	Shanpon		
3.7%	17%	70%	4%	9%			2.4%	9%	69%	6%	16%		
2	34567	34	13	Tanki	Shanpon		2	34567	34	13	Tanki	Shanpon	
4.9%	13%	60%	17%	3%	7%		4.4%	6%	57%	18%	5%	14%	
3	45678	45	12	24	Tanki	Shanpon	3	45678	45	12	24	Tanki	Shanpon
6.0%	11%	56%	13%	14%	2%	4%	5.9%	4%	50%	13%	20%	4%	9%
4	23456	23	56	35	Tanki	Shanpon	4	23456	23	56	35	Tanki	Shanpon
7.6%	9%	35%	43%	10%	1%	3%	6.7%	3%	25%	44%	17%	2%	8%
5	34567	34	67	46	Tanki	Shanpon	5	34567	34	67	46	Tanki	Shanpon
7.6%	8%	39%	39%	8%	2%	4%	7.1%	4%	35%	35%	14%	3%	9%