

# Opponents and Overcards: Part 1

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Several people have asked me to extend some of the tables I gave in earlier articles for nine opponents to fewer opponents. This makes sense to me because short-handed play and heads-up play have increased via online poker. So this article is going to extend the table that covered the situation of a player holding A-x, where x is not another ace.

We are interested in the probability that at least one opponent holds either A-A or A-y, where y is a bigger kicker than the player's x. The following table gives these probabilities.

kicker	9	8	7	6	5	4	3	2	1
K	.0220	.0196	.0171	.0147	.0122	.0098	.0073	.0049	.0024
Q	.1077	.0960	.0843	.0724	.0605	.0486	.0365	.0244	.0122
J	.1885	.1686	.1485	.1281	.1074	.0865	.0653	.0438	.0220
10	.2645	.2375	.2099	.1818	.1530	.1236	.0936	.0630	.0318
9	.3359	.3027	.2686	.2334	.1972	.1599	.1216	.0822	.0416
8	.4027	.3644	.3245	.2831	.2401	.1954	.1491	.1011	.0514
7	.4653	.4226	.3778	.3308	.2816	.2301	.1762	.1199	.0612
6	.5236	.4775	.4285	.3767	.3219	.2640	.2029	.1386	.0710
5	.5778	.5290	.4767	.4207	.3609	.2971	.2292	.1572	.0808
4	.6280	.5774	.5224	.4629	.3986	.3294	.2551	.1756	.0906
3	.6745	.6227	.5657	.5032	.4351	.3609	.2806	.1939	.1004
2	.7172	.6649	.6057	.5418	.4703	.3917	.3057	.2120	.1102

TABLE 1: ACE WITH KICKER

Let's first describe the table. The column headed "kicker" gives the rank of the kicker held by our given player. The columns headed by numerals correspond to the number of opponents our player is facing. The entries of the table give the probability that one or more opponents is holding A-y, where y is a rank bigger than the rank of the player's kicker.

For example, if our player has A-J and he has three opponents, then you look across the row labelled J until you reach the column headed by 3. The entry you find is .0653. This is the probability that one or more of your opponents has A-y, where y is bigger than J, and the possibility that the opponent has A-A is included in the probability. Hence, the odds against an opponent having a bigger A-y for a player holding A-J and facing three opponents is slightly less than 15-to-1.

A number of people have mentioned to me over the years that I give a lot of numerical information but essentially no advice about using the information. In other words, I keep away from giving playing advice. This seems as good a time as any to discuss this issue. I, too, have wondered about my reluctance to

give playing advice. I've had several opportunities to write books about playing poker, but always have deflected the people approaching me to other writers I respect. Recently I have come to the following conclusions concerning my reluctance to give playing advice.

I believe the strongest reason is because of my long career as a research mathematician. Our main goal is to prove theorems. A theorem is a statement that is 100% true and a proof is a certificate for the theorem that is 100% correct. In other words, I am engaged in an activity where we are producing objects that are 100% true 100% of the time.

In contrast, poker advice is typically about 90% true 90% of the time. I simply find it uncomfortable to work in that kind of environment. Years of training and work have led me in a completely different direction. One serious problem is that poker advice which is essentially always true also is so general that it is almost useless. It is especially useless to inexperienced players.

A second important reason I avoid writing poker advice is that it is difficult to say anything original. In mathematical research I work on new and/or unsolved problems. Originality is not a problem in that arena. However, rehashing poker advice that has appeared numerous times does not turn my crank. I find that poker magazines and gardening magazines have a lot in common in terms of originality. I mean, if you read how to grow asparagus in zone 4, how many more times do you need to read the same thing? On the other hand, I am able to write this column about poker and mathematics because it is different than just about anything else appearing in the various poker magazines. The fact that some people have told me how useful they have found some of the information is rewarding and makes some of the tedious calculations worthwhile.

Enough of my ranting! Let's return to the table above. The probabilities given in the table are exact values that were determined using inclusion-exclusion. The inclusion-exclusion calculations are straightforward because at most three players can have a bigger A-y than the given player. Another fact of which the reader should be aware is that we are ignoring opponents who may have been dealt a pair. We are interested only in bigger aces.

We can see that against a few players any ace gives the player a good chance of being ahead before the flop. Even with A-2, the chance that a single opponent has a better ace is only about 1 in 9. It also is interesting how many opponents there must be for the given player holding A-x to fall below 50% of having a better ace. With A-2 it does not happen until there are six opponents, and with A-6 it doesn't happen until there are nine opponents. The table is worth studying and thinking about how it might affect your short-handed play.