Warning: The version of this article printed in the magazine had a serious error arising because a decimal point was in the wrong place on line 6 of table two. This version is correct.

Aces occurring in hold'em hands

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This article is motivated by a conversation with Bruce Cheston of Regina, and the observation of an error (albeit small) in a poker book shown to me by Bruce. The topic deals with patterns of aces in nine- and ten-handed hold'em. There are three tables below which will vary in interest to different players.

Table one simply gives the probabilities for all possible ways that aces may appear in nine- and ten-handed hold'em. Let me say a few words about reading the table. The numbers in the left column tell us how the aces are distributed. For example, 2 means there is a single pair of aces, whereas, 1,2 means one player has a pair of aces and another player has a single ace. The corresponding numerical values are the probabilities of having the particular pattern of aces dealt.

Table one

Aces	10-handed	9-handed
0	.1328	.1713
1	.3664	.3979
1,1	.3298	.2984
2	.0183	.0186
1,2	.0213	.0181
1,1,1	.1135	.0844
2,2	.000166	.000133
1,1,2	.00532	.00372
1,1,1,1	.0124	.00745

Probably of more interest to players is what is going on in other hands with respect to aces. Table 2 gives the probabilities for the possible ace patterns depending on whether or not a fixed player holds an ace.

Let me describe the entries of this table. The columns are clearly marked for nine- and ten-handed hold'em. A 'yes' above a column means the fixed player has a single ace in her hand, whereas, a 'no' above a column means the fixed player does not have an ace in her hand. For example, a player holding a single ace in her hand in a nine-handed hold'em game is facing two players with single aces in their hands with probability .1943, or about one in five times.

Table two

Aces	10-handed		9-handed	
	yes	no	yes	no
0	.2531	.1561	.3053	.2014
1	.4555	.3877	.458	.4157
1,1	.2351	.3101	.1943	.2728
2	.01469	.01938	.01388	.01949
1,2	.00735	.02001	.00571	.01653
1,1,1	.03429	.09337	.02286	.06614
2,2	-	.000156	-	.000122
1,1,2	-	.00438	-	.00292
1,1,1,1	-	.00875	-	.00486

I find table three (the last table) the most interesting. It gives the probabilities that a player holding A-x, where x is not an ace, is facing one or more players with an ace and a bigger kicker. I am including A-A as a bigger kicker in an opponent's hand. For example, a player holding A-10 in a ten-handed hold'em game is facing at least one opponent with either A-A or an ace with a bigger kicker with probability .2469. This is about one in four times.

Table three

kicker	10-handed	9-handed
K	.022	.0196
Q	.1077	.096
J	.1885	.1686
10	.2645	.2375
9	.3359	.3027
8	.4027	.3644
7	.4653	.4226
6	.5236	.4775
5	.5778	.529
4	.628	.5774
3	.6745	.6227
2	.7172	.6649

There are many observations one can make by studying the above tables. Let me mention a few. Looking at table one, we can see that about seven out of 10 deals result in either a single ace or two players each having a single ace. The probability that two players are dealt pocket aces is .000166 or about 1 in 6,000 deals.

Looking at table two, we observe that a player holding a single ace is facing another ace with probability .4555 which is not much less than about one-half the time.

Looking at table three, we see that A-Q is outkicked only about one in ten times. In fact, the gaps between 10, J, Q and K as kickers are fairly substantial.

When you get down to small kickers, you can readily see how weak they are as aces. I know, I know, you'll curse these comments the next time A-3 whips your suited A-Q. Such is poker.