# Esther Discusses "A *Comprehensive* List of 8 *Different Categories* of Bridge Probabilities, and How These May Help Guide Your Bidding and Play"

## Bruce Thompson

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**Bruce**: Today, we are honored to have with us Esther Klinktoast-Houstonhousen, Quintuple Gold Emerald Life Master (20 Million+ ACBL MasterPoints), who will talk us through **"8 different categories of bridge probabilities, and how these may help guide your bidding and play"**. Ms. Klinktoast-Houstonhousen, thanks for taking the time to be with us today!

**Esther**: D\*\*n it, Bruce! How many times do I have to tell you to **NEVER, ever** call me Ms. Klinktoast-Houstonhousen! Always, **ALWAYS, *ALWAYS*** instead call me, Esther!

**Bruce**: Errr, well, sorry again about that, Ms. Klinktoast…, err, I mean Esther. Well, I assume that various probabilities involving bridge have long been of interest to bridge players, and to mathematicians/statisticians. Is that that correct?

**Esther**: Well, my *gracious giver*, that certainly is correct. For example, academic research articles on this topic have appeared periodically for many decades! Consider the following 2 articles as examples:
Waugh, D.F., & Waugh, F.V. (1953). On probabilities in bridge. <u>Journal of the American Statistical Association</u>, <u>48</u>(261), 79-87. DOI 10.1080/01621459.1953.10483456

Marshall, J.B. (1933). The probability distribution of a bridge hand. Edinburgh Mathematical Notes, 28, xvi – xviii. DOI 10.1017/S1757748900002322

**Bruce**: Errr, well, Esther… Before we continue with this fascinating bridge discussion of bridge probabilities, did you really just say *something nice* to me???

**Esther**: Well, my *handsome hero*, yes, I did indeed say something nice to you! After all, if I can constantly vacillate between demanding to be called "Ms. Klinktoast-Houstonhousen", or "Esther", why can't I also constantly vacillate between insulting you, and being nice to you???

**Bruce**: Well, OK, Ms. Klink…, errr, I mean, Esther. In any case, how many categories of probabilities are relevant to bridge bidding and/or playing?

**Esther**: Well, I will here consider **8 Categories of Bridge Probabilities:**
1. Hand HCP Probabilities
2. Suit Length Probabilities
3. Hand Distribution Probabilities
4. Hand HCP/Distribution *Combined* Probabilities
5. Trump Fit with Partner Probabilities When You Hold 1-Suited or 2-Suited Hands
6. **"Reciprocal Fit Probabilities": Opponents' Trump Fit Probabilities When You Have a Trump Fit, and *vice versa***
7. Probabilities of Dropping Opponents' Honor(s)
8. Probabilities of Opponents' Suit Card Splits

**Bruce**: OK. Are each of these 8 categories *equally important* to help guide our bridge bidding and/or playing? For example, will my knowing how often, on average, I will randomly draw a Hand in which every card is in the *same single Suit* make me a better bridge bidder or bridge player?

**Esther**: Well, no, my *inquisitive interlocutor*, of course not!!! But knowing some of these 8 categories of bridge probabilities, on the other hand, could help you a lot! The **8 Categories of Bridge Probabilities**, indeed, are not of equal importance! of course!!! In fact, they are roughly listed in *rank order of import*, from **least** practically important to **most** *practically* important. For example, with

respect to "1. Hand HCP Probabilities," it may be interesting to know that, if you play 26 Boards twice a week, you can expect to draw a hand consisting of 13 cards in a single suit, *on average*, once every 60,000 years![1] Of course, this is "*on average*", and may happen for you tomorrow, or in 10 years, or in 200,000 years! However, while this knowledge may be interesting, of course this particular fact can hardly be expected to help you play better bridge. Nevertheless, some minimal knowledge even of less useful probabilities may help you contextualize different bridge situations that you confront. And remember, pretty much *anything (like 13 cards in a single suit) can happen in bridge on any day, and on any Board*!

## LESS Critical Probabilities as Regards *Practical Utility* for Bridge Bidding and Play

**Bruce**: OK. Well, let's start then by covering these various **8 Categories of Bridge Probabilities**.

**Esther**: Excellent! Let's first discuss **1. Hand HCP Probabilities**. Here are a few relevant probabilities derived from the "Relevant Probabilities for Bridge Players" article:[2]

1. Over half (**52.6%**) of all your Hands will contain **7-12 HCPs.**
2. About **20.6%** of all your Hands will contain **0-6 HCPs.**
3. About **10.1%** of all your Hands will contain **15-17 HCPs**, which many Partnerships play as 1 requirement for opening with a 1**NT** bid.
4. About **1.0%** of all your Hands will contain **20-21 HCPs**, which many Partnerships play as 1 requirement for opening with a 2**NT** bid.

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[1] See the **excellent** article "Relevant Probabilities for Bridge Players," available on the Web at: **https://www.bridgewebs.com/taverham/Probabilities.pdf**

[2] Also see: Occen (2016), "Bridge Hand Probability Analysis", available at: **https://www.occasionalenthusiast.com/bridge-hand-probability-analysis/**

> **5.** About **0.4%** of all your Hands will contain **22-24 HCPs**, which many Partnerships play as 1 requirement for opening with an artificial, strong 2**C** bid.

**Bruce**: OK. What's next?

**Esther**: Next, let's discuss **2. Suit Length Probabilities**. Here are a few relevant probabilities from the 2016 "Bridge Hand Probability Analysis" article:

| Suit Length | Probability | Suit Length | Probability |
|---|---|---|---|
| 0 | 5.1% | 7 | 3.5% |
| 1 | 30.8% | 8 | 0.5% |
| 2 | 64.9% | 9 | 0.04% |
| **3** | **74.2%** | 10 | 0.002% |
| 4 | 66.7% | 11 | 0.00004% |
| 5 | 45.8% | 12 | < 0.00001% |
| 6 | 16.6% | 13 | < 0.00001% |

1. When you are randomly dealt 13 cards across 4 suits, the most likely count (**74.2%**) for any given suit would be 13/4 = 3.25, or **3**!
2. Holding a **void** (**5.1%**) is *slightly more common* than holding a **7-card suit** (**3.5%**)!
3. Because the probability of holding a void is **5.1%**, and the probability of holding a singleton is **30.8%**, **holding either a void or a singleton** will happen in over 1/3 (5.1% + 30.8% = **35.9%**) of the Hands you are dealt!

**Bruce**: OK. What's next?

**Esther**: Next, let's discuss **3. Hand Distribution Probabilities**. Here are a few relevant probabilities from "Relevant Percentages for Bridge Players" and Occen (2016), "Bridge Hand Probability Analysis":

1. The 2 most common Hand Distributions are **4432**[3] (**21.6%**) and **5332** (**15.5%**), which together account for **37.1%** of the Hand Distributions you will be dealt.

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**[3]** These distributions say, for example, if **4432**, 4 of 1 suit (<u>not</u> necessarily Spades), 4 of a second suit (<u>not</u> necessarily Hearts), 3 of a third suit (<u>not</u> necessarily Diamonds), and 2 of the fourth suit (<u>not</u> necessarily Clubs).

2. Most players will *only* bid **NT** when holding, in addition to HCPs requirements, (1) <u>no</u> void, (2) <u>no</u> singleton, and (3) and <u>not more than 1</u> doubleton, but may bid **NT** when holding a 5-card Major. About **48%** of the Hands (4432, 5332, 4333) you are dealt will meet this distribution requirement.
3. About **2/3** of all the hands you are dealt will contain a **5-card or longer suit**.
4. As noted previously, about **1/3** (**35.9%**) of all the Hands you are dealt will contain **a void or a singleton**.
5. About **3.9%** of all the Hands you are dealt will contain a **7-card suit**.
6. About **0.5%** of all the Hands you are dealt will contain an **8+ card suit**.

**Bruce**: Next.

**Esther**: Well, let's discuss **4. Hand HCP/Distribution *Combined* Probabilities**. Here are a few relevant probabilities from Occen (2016), "Bridge Hand Probability Analysis", limited to (1) the **5 most common Hand Card Distributions** and (2) hands holding **10-17 HCPs**.

| Combo | | | | | | Hand HCPs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rank | % | Dist. | 10 | 11 | 12 | **13** | **14** | **15** | **16** | **17** |
| 1 | 21.6% | 4432 | 1.98 | 1.89 | 1.70 | **1.47** | **1.22** | **0.96** | **0.72** | **0.52** |
| 2 | 15.6% | 5332 | 1.44 | 1.37 | 1.23 | **1.06** | **0.88** | **0.69** | **0.52** | **0.37** |
| 3 | 12.9% | 5431 | 1.22 | 1.16 | 1.04 | **0.90** | **0.74** | **0.57** | **0.43** | **0.30** |
| 4 | 10.6% | 5422 | 0.99 | 0.94 | 0.85 | **0.73** | **0.60** | **0.47** | **0.35** | **0.25** |
| 5 | 10.5% | 4333 | 0.96 | 0.92 | 0.82 | **0.71** | **0.59** | **0.47** | **0.36** | **0.26** |
| **Tot.** | **71.1%** | | 6.59 | 6.28 | 5.65 | **4.87** | **4.03** | **3.16** | **2.38** | **1.71** |

Thus, **71.1%** of all Hands will be in 1 of these 5 most-common card-distribution patterns.

The entries in **bold red** are Hands that meet the requirements of (1) 15-17 HCPs and (2) the commonly-used distribution requirements for making a 1**NT** opening bid. Thus, 3.16 + 2.38 + 1.71 = **7.24%** of Hands hold **15-17 HCPs** from among the Hands involving (a) 1 of the 5 most-common Hand Card Distributions <u>and</u> (b) 10-17 HCPs.

The entries in **bold black** are Hands that meet the requirements of 13-14 HCPs to open with a 1-level suit bid

sitting first or second. Thus, 1.47 + 1.06 + 0.90… + 0.60 +

0.59 = **8.90%** of Hands involving (a) the 5 most-common
distributions <u>and</u> (b) 10-17 HCPs hold (1) **13-14 HCPs** <u>and</u>
(2) may hold a 5-card suit <u>or</u> a 4-card Major that can be
found by opening a "Convenient Minor".

> The entries in **bold green** meet the requirements of
Marty Bergen's "Rule of 5" for opening with fewer than 13
HCPs even when sitting first or second, as discussed in
**Esther Bridge Lesson #7 "Rule of 5"**. Thus, 1.16 + 0.94
+1.70… + 0.85 = **6.93%** of Hands involving (a) the 5 most-
common distributions <u>and</u> (b) 10-17 HCPs hold (1) HCPs <u>plus</u>
(2) number of cards in the Player's longest 2 suit = **20+,**
which means the Player can open a 1-level suit bid even
sitting first or second without 13+ HCPs.

## <u>MORE</u> Critical Probabilities as Regards *Practical Utility* for Bridge Bidding and Play

**Bruce**: So, what now?

**Esther**: Well, now we are starting to get into Bridge Probability
Categories that do more than contextualize hands we may
see, and more into probabilities that are more directly
useful when bidding or playing! We will next consider: **5.
Trump Fit with Partner Probabilities When You Hold
1-Suited <u>or</u> 2-Suited Hands.**[4] We start with
consideration of you holding a **1-suited hand** (i.e., <u>not</u> a
5-5 or a 5-4 holding in your longest 2 suits). The focus
here is on you and Partner finding an **8+ card fit in a
suit.** As you might expect, the probability of you finding
an 8+ card fit with Partner in a suit is directly tied to
*how many cards you hold in the suit*, as follows, with the
following table entries showing the <u>probability in %'s</u>:

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[4] The information in this Bridge Probabilities Categories section, and the next section, is drawn
from Boco San (2004), "How Often You Get Trump Fit with Your Partner", available at:
**http://hp.vector.co.jp/authors/VA051022/Tripod/Prob.htm**

```
Your    Fit           Number of Partner's Cards in the Same Suit
Cards   Prob.   0    1    2    3    4    5    6    7    8    9    10+
  0     1.2    0.1  1.5  7.4 18.7 27.5 24.8 13.9  4.9  1.0  0.1  0.0
  1     3.4    0.2  2.6 10.6 22.9 28.6 21.6 10.1  2.9  0.5  0.0  0.0
  2     8.5    0.5  4.1 14.5 26.7 28.1 17.7  6.7  1.5  0.2  0.0  0.0
  3    18.1    0.8  6.4 19.2 29.6 25.9 13.3  4.0  0.7  0.1  0.0  0.0
  4    33.7    1.5  9.6 24.2 31.1 22.2  9.1  2.1  0.3  0.0  0.0
  5    54.4    2.5 13.9 29.2 30.6 17.4  5.4  0.9  0.1  0.0
  7    92.9    7.1 26.2 35.7 22.8  7.1  1.0  0.1
```

Note. "Fit Probability" = the sum of the probabilities involving situations where with your suit holding your Partner has sufficient cards in the same suit to yield 8+ cards in the suit for your Partnership. For example, if you hold 4 cards in a suit, the probability of Partner holding 4 to 9 cards in the same suit equals 22.2% + 9.1% + 2.1% + 0.3% + 0.0% + 0.0% = **33.7%**.

**Bruce**: What are some of the implications of these probabilities, Esther?

**Esther**: Well, Bruce, my *saintly sycophant*, when you hold the HCP requirements to bid, these probabilities inform your thinking about whether Partner will hold the cards required to obtain an 8+ card fit, suitable to make at least a 4-card contract, assuming suitable HCPs in the Partnership. This tells you *whether opening bids are likely to pay off in trump card fits*. For example:
1. If you hold a **4-card Major**, and you bid a "Convenient Minor" to try to find this fit, the probability that your Partnership holds an 8+ card fit will be about **33.7%**. So, your odds of success in your mission to find an 8+ card fit when you hold a 4-card suit are substantial, but somewhat unlikely!
2. If you hold a **5-card Major**, you are *more likely than not* (**54.4%**) to find an 8+ card fit in your suit.
3. If you hold a **6-card Major**, and you open either at the 1-level, or with a "weak" 2-level preempt bid, the probability is **76.3%** that your Partnership will hold 8+ cards!

4. If you hold 7 cards in a Major, and you open with a "weak" 3-level preempt bid, it is *almost certain* (**92.9%**) that Partner will hold 1 or more of your bid suit.

**Bruce:** OK, Esther, but what if you hold a **2-suited hand**, such as a 5-5 or a 5-4 hand, maybe even in the 2 Majors!???

**Esther:** Well, Bruce, now is where things get *really, really interesting*! **Holding a 2-suited Hand dramatically improves the probability of your Partnership finding an 8+ card fit!!!**

| You Hold | Your 2-Suited Hand | | | | |
|---|---|---|---|---|---|
| | 4-3 | 4-4 | **5-3** | **5-4** | **5-5** |
| Probability of an 8+ Card Fit | 48.9% | 60.3% | **66.1%** | **74.2%** | **83.5%** |

These *strikingly-elevated probabilities of finding a fit when holding a 2-suited hand* underline the importance of Bergen's "Rule of 20". Not only do 2-suited hands play better in a suit contract, because you can trump or slough losers on the side suit, but also because holding a 2-suited hand so dramatically raises the probabilities of finding an 8+ card fit!**[5]**

**Bruce:** Oh, my! I am not sure that I can take any more! But at the risk of overload, what's next?

**Esther:** Well, Bruce, next we consider "**6. 'Reciprocal Fit Probabilities': Opponents' Trump Fit Probabilities When <u>You</u> Have a Trump Fit, and *Vice Versa***". Put simply, when you and Partner hold an 8+ card fit in a suit, or in 2 suits, your Opponents are <u>also</u> likely to hold an 8+ card fit in 1 or more suits! This is <u>primarily important</u> from a practical point of view because this reality means that, **just because Opponents have shown an 8+ card fit, you should <u>not</u> assume that you and your Partner do <u>not</u> hold 1**

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**[5]** These probabilities for 2-suited hands also highlight why *artificial Overcall bids*, such as the "Unusual 2**NT**" and "Michael Michaels Cue Bid", showing 2-suited holdings, are so appealing, because the probabilities of finding fits with such 2-suited hands are so high! For more information, on the "Esther Bridge Lessons" website, see respectively: "**Convention #8: Unusual 2**NT", and "**Convention #12: Overcall Two-Suited Distribution Cuebid Systems**".

**or more fits in a different suit**!!! So, you may wish to Overcall Opponents if you think you can *suss* out your Partnership's fitting suit(s)!

**Bruce**: OK. Is there any *special terminology* we need to know before we get into any specifics?

**Esther**: Well, Bruce, yes, indeed. We next to distinguish you and Partner, or your Opponents, holding **1** 8+ card fitting suit, or holding **2** 8+ card fitting suits. We will call you and Partner, or your Opponents, holding a **1** Suit with an 8+ card fit when the other Partnership also holds an 8+ card suit fit a "**Single Double**", or a "**SD**". We will call you and Partner, or your Opponents, holding **2** Suits with an 8+ card fit a "**Double Double**", or a "**DD**".

**Bruce**: Oh, my! Can this <u>really</u> happen?

**Esther**: Well, Bruce, it's bridge! And <u>plenty</u> of *hinky things* can happen in bridge!

**Bruce**: Oh, my! I think you are killing me! What's next?

**Esther**: Well, Bruce, here are the probabilities in Percentages for your Opponents holding either 1 (a **SD** 8+ card suit fit) or 2 8+ card fits (a **DD** 8+ card suit fit) when your Partnership holds either 1 or 2 8+ card suit fits:

| Our Trump Card Counts | 7 | 8SD | 8DD | 9SD | 9DD | 10 | 11 | 12 | 13 | Freq. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (8**DD** = 8 + 8; 9**DD** = both 9+8 and 9+9) | | | | | | | |
| 7 | **66.7** | 33.3 | * | * | * | * | * | * | * | 15.7% |
| 8**SD** | 14.8 | **66.7** | * | 18.5 | * | * | * | * | * | 35.4% |
| 8**DD** | * | * | 32.1 | 47.6 | * | 19.0 | 1.3 | * | * | 10.3% |
| 9**SD** | * | 32.4 | 24.3 | 36.0 | * | 7.2 | * | * | * | 20.2% |
| 9**DD** | * | * | * | * | **56.0** | 33.5 | 9.6 | 0.8 | .02 | 7.9% |
| 10 | * | * | 22.7 | 16.8 | 30.4 | 23.4 | 5.8 | 0.8 | .04 | 8.7& |
| 11 | * | * | 8.5 | * | 48.2 | 32.1 | 9.7 | 1.5 | .09 | 1.6% |
| 12 | * | * | * | * | 41.0 | 41.2 | 14.9 | 2.7 | .19 | 0.2% |
| 13 | * | * | * | * | 24.3 | 48.6 | 22.1 | 4.6 | .38 | <.1% |
| Total | | | | | | | | | | **100.0%** |

"**\***" = "Such an event never occurs.

**Bruce:** Well, Esther, what patterns emerge from these "Reciprocal Fit Probabilities"?

**Esther:** Well, Bruce, I would emphasize 2 things:
1. In the words of Boco San (2004), "When you've 10 trumps in your [Partnership's] two hands…, [O]pponents will have <u>at least</u> an 8-card double fit [8**DD**]. They will <u>never</u> have a simple 8-card fit." [Emphasis added.]
2. And, also, when "you have an 8-card double fit [8**DD**] in [your Partnership's] two hands, Opponents will then hold its complementary 5-5-$\underline{x}$-$\underline{y}$, where $\underline{x}$ + $\underline{y}$ = 26 − 5 − 5 = 16, because they have 26 cards in their [two] hands. If $\underline{x}$ = 8, then $\underline{y}$ = 8, and if $\underline{x}$ = 9, then $\underline{y}$ = 7, etc."

**Bruce:** Esther, what does all this mean? What is the <u>bottom line</u>?

**Esther:** Well, Bruce, when your Partnership has shown an 8+ card fit, be aware that Opponents are likely to *also* hold an 8+ card fit in a different suit or suits. And be aware that, conversely, when your Opponents have shown an 8+ card fit, your Partnership is *also* likely to hold an 8+ card fit in a different suit or suits.[6] Clearly, <u>both</u> Partnerships can hold 8+ card fits, and you should be aware of this, and bid and play accordingly. *If your Opponents have shown an 8+ card fit in a suit, do you have enough (1) HCPs and (2)* ***"Remaining Bidding Space"*** *to make it reasonable to try to find your fit(s)? If your Partnership has shown an 8+ card fit, is it likely that Opponents hold an 8+ card fit, and thus are short, and can ruff, in your long suit(s),* <u>*or*</u> *may instead find their fit(s) if your Partnership doesn't eat up "Remaining Bidding Space"?*

**Bruce:** Esther, would you talk a bit more about this "**Remaining Bidding Space**" concept?

**Esther:** Well, Bruce, **managing your (<u>and</u> your Opponents')** "**Remaining Bidding Space**" is very important. Whenever you bid a suit or **NT** or Double or Redouble, or instead bid

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[6] This mathematical/statistical *fact* is also why Esther, in her "Esther Bridge Lessons" **#39**, so *adamantly* argued <u>not </u>to let Opponents play a 2**H** contract, when the auction progresses "1**H**, Pass, 2**H**, Pass, Pass, ?", or the parallel auction in Spades!

Pass, you are communicating information to <u>both</u> Partner and your Opponents. When you and Partner know that you have "game-going" holdings (and know conversely that your Opponents hold *bupkus*, and therefore are very unlikely to bid or interfere with your bidding), then you want to follow the wise admonition, "*Talk slowly and <u>more</u> when you and Partner hold the <u>most</u> and have the <u>most</u> to say!*"[7] But, conversely, you may want to eat up bidding space when you know that both Pairs hold (1) HCPs and (2) 1 or more 8+ card fits, and you keeping the bidding low in this situation allows Opponents more opportunities to discover their fit(s). Of course, Opponents bidding and finding fit(s) is less of a concern when you and Partner have found a fit in Spades, because you are then better positioned to control the final contract even if Opponents have and find their 8+ card fit(s).

**Bruce**: Well, Esther, how in the world would Partners ever know whether they do, *or* do <u>not</u>, hold *at least* "game-going" Hands?

**Esther**: Well, Bruce, that's why many people play conventions such as "**2 Over 1**"[8], and "**Jacoby 2**NT"[9]! In my opinion, I think *newer players should begin playing these 2 conventions <u>no later</u> than 2 or 3 months into learning how to play bridge*. It is very important to know, <u>early in the auction</u>, whether your Partnership does, or does <u>not</u>, hold *at least* "game-going" possibilities! And playing these 2 conventions settles the matter, either way, <u>early</u> in the auction! And this is <u>exactly</u> what newer players struggle to determine, either way!

**Bruce**: Oh, my head hurts, or may be broken! Perhaps permanently!

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[7] However, if you know <u>both</u> that (1) you <u>can</u> make Game (2) but <u>not</u> Slam, then *immediately* bid Game, following the bridge admonition, "He who knows, goes!"

[8] Within the "Esther Bridge Lessons" website, see "**Convention #1: '2 Over 1'**". Notice that this Lessons is Convention **#2** (for a reason)!

[9] Within the "Esther Bridge Lessons" website, see "**Convention #2: 'Jacoby 2NT'**". Notice that this Lessons is Convention **#2** (for a reason)!

**Esther:** Well, Bruce, then let's move on to discussing: "**7. Probabilities of Dropping Opponents' Honor(s)**".

**Bruce:** Oh, my! I think you are killing me! But go ahead, Speak!

**Esther:** Well, Bruce, here are the probabilities[10] that *by playing your Suit Top Honors you can drop* either (1) missing Trump Honors, when you are playing a Suit contract, <u>or</u> (2) missing Honors in a long suit that you are trying to run as Declarer in a **NT** contract[11] [12]:

```
              Probability of Dropping Missing…
   Cards Out     K       Q       J       T
       2        52%    100%    100%    100%
       3        26%     78%    100%    100%
       4        12%     52%     90%    100%
       5         5%     31%     73%     96%
       6         3%     19%     54%     87%
       7         1%      9%     38%     71%
```

**Bruce:** Ok, what's the <u>bottom line</u>?

**Esther:** Well, Bruce:
1. With **2** cards out, and you hold the **Ace**, play your Ace to drop the <u>missing King</u> (**52%**).
2. With **3** cards out, and you hold **A,K**, play the Ace, and if the <u>missing Queen</u> doesn't drop, then play your King (**78%**).
3. With **4** cards out, and you hold **A,K**, play the Ace, and if the <u>missing Queen</u> doesn't drop, then play the King (**52%**).
4. With **4** cards out, and you hold **A,K,Q**, you will likely drop the <u>missing Jack</u> (**90%**).

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[10] From the "**Relevant Percentages for Bridge Players**" web posting on the BridgeWebs website.

[11] Of course, successful drops are assured in certain situations. For example, if your Partnership holds the Ace, and 12 cards, the Opponents' King is toast. Or, if you hold A,K, and 11 cards, the Opponents' Queen is burnt toast.

[12] For additional explanation of how these "odds of successfully 'dropping' missing honors" are computed, see **Appendix A**.

5. With **5** cards out, and you hold the **A,K,Q**, you will likely drop the <u>missing Jack</u> (**73%**).

**Bruce**: Oh my Goodness! Please stop, Esther! head hurts, or may be broken! Perhaps permanently!

**Esther**: Well, Bruce, then let's move on to discussing our final category of bridge probabilities: "**8. Probabilities of Opponents' Suit Card Splits**". We will (<u>for a reason</u>) distinguish between having an **Odd** number of cards out, versus an **Even** number of cards out.

| **Odd** # of Cards Out | Percentages of Splits for Opponents' Cards | | | | |
|---|---|---|---|---|---|
| 3 | | | | 2-1 **78%** | 3-0 22% |
| 5 | | | 3-2 **68%** | 4-1 28% | 5-0 4% |
| 7 | | 4-3 **62%** | 5-2 30% | 6-1 7% | 7-0 0.5% |
| 9 | 5-4 **59%** | 6-3 31% | 7-2 9% | 8-1 1% | 9-0 0.1% |

| **Even** # of Cards Out | | | | | |
|---|---|---|---|---|---|
| 2 | | | | 1-1 **52%** | 2-0 **48%** |
| 4 | | | 2-2 41% | 3-1 **50%** | 4-0 10% |
| 6 | | 3-3 35% | 4-2 **49%** | 5-1 15% | 6-0 2% |
| 8 | 4-4 33% | 5-3 **47%** | 6-2 17% | 7-1 3% | 8-0 0.2% |

**Bruce**: Well, Esther, why did you split out situations with an **Odd** number of cards out, versus situations with an **Even** number of cards out?

**Esther**: Because, Bruce, it is *vitally important* for you to see, realize, and <u>remember</u>, that whenever you are drawing Trump in a suit contract, or running a long suit in a **NT** contract, the probabilities of your early success vary dramatically when there is an **Odd** number of cards versus when there is an **Even** number of cards out.
1. **Even** cards out do <u>not</u> split evenly! But
2. **Odd** cards out <u>do</u> split as evenly as possible!

And notice that:
1. With **3** cards out, the likelihood of the 2-1 split is **78%**, while with **2** cards out, the likelihood of the 1-1

split is **52%**, and **78%** – **52%** = <span style="color:red">**26%**</span>. With 2 cards out, an <u>uneven 2-0</u> split is only *slightly less likely* (**48%**) than an <u>even 1-1</u> split (**52%**).

2. With **5** cards out, the likelihood of the 3-2 split is **68%**, while with **4** cards out, the likelihood of the 2-2 split is **41%**, and **68%** – **41%** = <span style="color:red">**27%**</span>. With 4 cards out, an <u>uneven 3-1</u> split is <u>more likely</u> (**50%**) than an <u>even 2-2</u> split (**41%**)!

3. With **7** cards out, the likelihood of the 4-3 split is **62%**, while with **6** cards out, the likelihood of the 3-3 split is **35%**, and **62%** – **35%** = <span style="color:red">**27%**</span>. With 6 cards out, an <u>uneven 4-2</u> split is <u>more likely</u> (**49%**) than an <u>even 3-3</u> split (**35%**)!

4. With **9** cards out, the likelihood of the 5-4 split is **59%**, while with **8** cards out, the likelihood of the 4-4 split is **33%**, and **59%** – **33%** = <span style="color:red">**26%**</span>. With 8 cards out, an <u>uneven 5-3</u> split is <u>more likely</u> (**47%**) than an <u>even 4-4</u> split (**33%**)!

**Bruce**: Oh, bridge can be so *hinky*!

**Esther**: Yes, Bruce, bridge can be challenging! Bridge has humbled many an accomplished person! And learning bridge is a lifelong endeavor! Every day you sit at the bridge table you will see something amazing! But it, indeed, humbling! And as ACBL LifeMaster Betty Davis once said, bridge "…is <u>not</u> for the faint hearted!"

**Appendix A**
**Illustrative Calculation of the Probability of**
**"Dropping" Missing Honor(s) by Leading Top Honors**

1. Let's say that your N/S Partnership (1) holds 10 of the 13
   total Trump cards, missing only Q,9,3.
2. Determine all the possible positions of the Q,9,3:

   |   | EAST | WEST |
   |---|------|------|
   | **1.** | **Q** | **9,3** |
   | **2.** | **9** | **Q,3** |
   | **3.** | **3** | **Q,9** |
   | **4.** | **Q,9** | **3** |
   | **5.** | **Q,3** | **9** |
   | **6.** | **9,3** | **Q** |
   | 7. | Q,9,3 | -- |
   | 8. | -- | Q,9,3 |

3. If you lead the Ace, followed by the King, you will "drop"
   the missing Queen in the **6** out **8** equally likely
   distributions of the 3 missing Trump cards, with these 6
   distributions being presented in **bold** above. 6 / 8 = ¾, or
   **75.0%**.
4. Of course, you also might capture the missing Queen by
   using a "finesse", which would slightly improve your odds
   of success. See among the "Esther Bridge Lessons": "**41. The
   Art of the Bridge Finesse**".