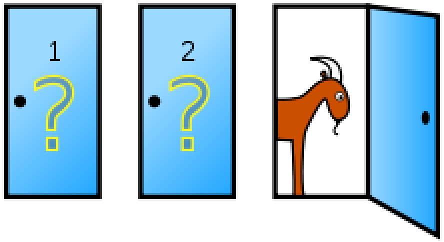
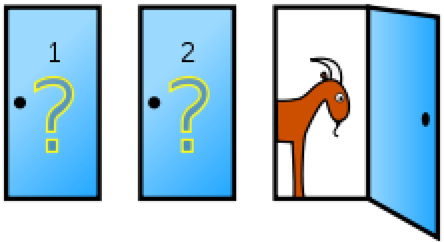
Restricted Choice ♥AK10xx
♥xxxx

and the Monty Hall Problem



Monty Hall Problem



In search of a new car, the player picks a door, say 1. The game host then opens one of the other doors, say 3, to reveal a goat. Monte offers to let the player pick door 2 instead of door 1.

Switch or Stay put?

Bridge Problem

Dummy: ♥AK10xx

Declarer: ♥xxxx

- You play the ace, and the queen falls to your right.
- You get back to your hand, lead a card, and LHO gives you a low card.

Do you finesse the 10, or play the king?

Solution to Monty Hall Problem/Three Cases

behind door 1	behind door 2	behind door 3	result if staying at door #1	result if switching to the door offered
				
				
				

Three equally likely possibilities. Assume you always pick Door 1.

The probability of winning by staying with the initial choice is 1/3, while the probability of winning by switching is 2/3

Reaction to Solution

- After the problem appeared in *Parade*, approximately 10,000 readers, including nearly 1,000 with PhDs, wrote to the magazine, most of them claiming it was wrong.

Solution to Monty Hall Problem/Two Cases

You observe that door 3 opened, not door 2, so throw the last case out. The car is behind door 1 or door 2. ***But these are not equal cases.***

- If the car is behind door 2, then this is one case. Monte has a ***restricted choice***. He won't show door 2

- If the car is behind door 1, Monty has a ***real choice*** whether to open door two or door three, not the restricted choice if it was behind door 2. So in this case, the appearance of the goat behind door 3 is only "half a case."
- Thus we have odds of 1:½, or 2/1 in favor of switching.

Solution to Bridge Problem/Three Cases

- **Case 1:**

♥AK10xx

♥xx ♥QJ

♥xxxx

- **Case 2:**

♥AK10xx

♥Jxx ♥Q

♥xxxx

- **Case 3:**

♥AK10xx

♥Qxx ♥J

♥xxxx

In two cases out of three you win by finessing the 10.

Solution to Bridge Problem/Two Cases

- One might argue that case 3, with the stiff jack, can be eliminated, since the queen appeared.
- But if RHO has only one card, he has no choice, and the stiff queen is one case. But if he has QJ stiff, he can play either one. So seeing the queen when RHO has QJ is in a sense, only "half a case", not one of equal likelihood.
- Again, it's 1:½, or 2/1 in favor of the finesse.

Restricted Choice of LHO

- The sense that you have a 50-50 shot either way can be traced to the assumption that the LHO plays randomly when declarer leads.
- But LHO has restricted choice of a different kind. If LHO started with Jxx, he’s necessarily going to play a low card on each of the first two rounds.

Restricted Choice Missing K & Q

- Dummy: ♦AJ10xx
- Declarer: ♦xxxx
- You finesse the 10 first round and RHO takes the trick with the king.
- You get back to your hand, lead low, LHO plays low.
- Finesse the Jack or play the Ace?
  - ***Odds strongly favor the finesse***

Solution to Missing K and Q

- Case 1:

	♦AJ10xx	
♦xx		♦KQ
	♦xxxx	

- Case 2:

	♦AJ10xx	
♦Kxx		♦Q
	♦xxxx	

- Case 3:

	♦AJ10xx	
♦Qxx		♦K
	♦xxxx	

In two cases out of three you win by finessing the jack on the second round.

Restricted Choice Missing A, K, 10

- Dummy: ♣QJ9
- Declarer: ♣xxx
- You play from hand, LHO plays low, and the queen fetches the ace from RHO.
- Back in hand, you play low, LHO plays low.
- Do you play the jack or finesse the 9?

Odds strongly favor playing the jack.

Solution to Missing A, K, 10

- Case 1:

♣QJ9

♣xxxx ♣AKx

♣xxx

- Case 2:

♣ QJ9

♣Kxxx ♣Axx

♣xxx

- Case 3:

♣ QJ9

♣Axxx ♣Kxx

♣xxx

Finessing the 9 on the second round is a 50% shot. But the jack wins 2 out of 3 times.

Summary Missing Two Touching Honors

- When one of the two honors shows up, it’s twice as likely the other opponent has the missing one.
- *You’ve learned no information from which of the two honors the RHO dropped.*

Extreme Example: Missing J, 10, 9

- Dummy: ♠AKQ8
- Declarer: ♠xxx

The Ace drops the 9 and the King drops the 10.
You lead low from your hand and LHO plays low.

Finesse the 8 or play the queen?

- **There are 4 cases for RHO:**

  ♠J109, ♠J10, ♠J9, ♠109.

- **In 3 out of four cases, the third-round finesse will be right!**

Defensive Strategies

Dummy: ♥AK10xx

Declarer: ♥xxxx

1. Mix it up with touching honors!

Don’t play reliably, either the highest or the lowest. If you regularly play the Q from QJ, this gives away the store. Similarly, don’t consistently play J from QJ.

This would be as if Monte Hall reliably opens door 3 if the car is behind door 1.

Defensive Strategies

Dummy: ♥AK10xx

Declarer: ♥xxxx

2. Don’t signal count!

If you have J43 on the left, don’t necessarily play the 3, then the 4.

If you have 43 only, don’t necessarily play the 4.

Historical Notes

- Marilyn von Savant answered the Monte Hall problem in 1990 in Parade Magazine.
- Terrence Reese and Alan Truscott dealt with the Restricted Choice problem in the early 1950's.