

GOD'S IMITATOR

Chapter 9: Three-Door Problem

Li Renshu thought seriously for a moment and said, "You mean you could see through the language trap that the designer buried in the rules, and then shoot yourself with all six shots?"

What everyone saw were the complete rules, which meant they knew that the real bullet was in the innocent person's pocket, not in the revolver's cylinder.

What the rules stated: [The revolver's cylinder has 6 chambers, with five empty chambers distributed in random positions in the cylinder.]

This was a pure language trap.

Anyone who knew this point could indeed clear the game without injury.

Wang Yongxin immediately objected, "But that's because we have God's perspective.

"Suppose we woke up knowing nothing, and were told these rules under life-threatening circumstances, the vast majority of people couldn't achieve the rational thinking you mentioned.

"Thinking you could notice such a trap is being overly confident in your own rationality."

Cai Zhiyuan shook his head, "No, I think even without noticing this trap, it wouldn't prevent clearing the game.

"Let's sort out the probability issues here.

"First, the total distance of the iron block mechanism from both sides of the player's head is 6cm, meaning an average of 3cm on each side. Shooting the innocent person once causes each side's iron block to move inward 1.29cm.

"This means the first two movements are harmless, and the third movement causes far less damage than the later ones.

"The fourth, fifth, and sixth movements would each cause increasingly severe head damage, with danger levels rising exponentially. By about the fifth movement, death would be certain.

"So when considering death risk, we must consider not only 'being hit by bullets' but also 'being crushed by the mechanism.'

"Assuming five mechanism movements would be fatal, we can roughly view each mechanism movement as accumulating $1/5$ of a death progress bar. Of course, the mechanism's death rate isn't evenly distributed but increases toward the end.

"Shooting yourself has a $1/6$ probability of death, no question about that. Shooting the other person has a $5/6$ probability of being blank, but the mechanism movement still brings $1/5$ of the death progress bar.

"The actual risk of shooting yourself versus shooting the other person is roughly the same.

"Since five movements could be fatal, we must choose at least two shots to shoot ourselves.

"Assuming there really is one real bullet in the gun, each shot has a $1/6$ probability of hitting. Which two shots we choose to shoot the other person doesn't actually affect the game's outcome.

"But psychologically, choosing the first two shots is definitely best.

"Because in actual operation, if the previous shot misses, the probability of the next shot increases accordingly, creating enormous psychological pressure.

"For example, if the first shot fires blank without your knowledge, then every subsequent shot's probability becomes $1/5$. If the second shot also fires blank, every subsequent shot becomes $1/4$, and so on.

"So regardless of whether you think each shot's probability is the same or different, the first two shots should prioritize shooting yourself.

"By the fourth shot, there's a new hint: the fifth shot is blank.

"This hint is incredibly merciful, isn't it just the classic three-door problem?"

"This means the fourth shot still has a $1/3$ probability of containing the real bullet, while the sixth shot's probability of containing the real bullet becomes $2/3$. If one can make rational decisions, the fourth shot should still be aimed at yourself.

"If you can grasp this point, then even if you choose to shoot the innocent person with the last shot, plus the one shot at the innocent person among the first three shots, the iron block mechanism would move at most twice.

"Distance-wise, there wouldn't even be superficial wounds.

"Moreover, from God's perspective we know there isn't a single bullet in the revolver, so the possibility of being shot to death simply doesn't exist."

Everyone fell into temporary silence.

Newspaper editor Jiang He frowned tightly and asked, "I roughly understood the first part, but didn't understand the last three shots. What is the three-door problem?"

Cai Zhiyuan was somewhat surprised, "You don't even know this?"

"Well then, let me explain briefly. This is actually a very classic probability problem.

"It originates from a foreign television show:

"Contestants face three closed doors, behind one door is a car that they can win if chosen, behind the other two doors there's nothing.

"The contestant selects one door but doesn't open it immediately.

"At this point, the host opens one of the other two doors, revealing nothing behind it, no car. Note that the host doesn't randomly open a door, because he's the host, so he knew from the start which door had the car behind it. The door he opened was one he knew beforehand was empty.

"Then the host asks the contestant: do you want to switch doors?"

"If you were the contestant, would you switch?"

Jiang He thought for a moment and said decisively, "I wouldn't switch. I trust my first instinct.

"Moreover, doesn't each door have a $1/3$ probability of having the car behind it? What difference would switching make?"

Cai Zhiyuan shook his head, "Then you'd be wrong.

"Because the original door's probability of having the car remains unchanged at $1/3$, but the other door's probability of having the car becomes $2/3$, so you should switch."

Jiang He was stunned, "Huh? Why?"

Cai Zhiyuan explained, "That's why the three-door problem became a classic probability problem. It seems simple but is very counter-intuitive.

"Your confusion is normal, because this problem sparked heated debate at the time, with many scientists and scholars opposing this conclusion.

"This problem is complex to prove, but I have a more understandable explanation:

"Suppose we now increase the number of doors to 10,000, with 1 door having a car behind it and the other 9,999 doors having nothing.

"You select one door, the host knows the car's location in advance, then he opens the other 9,998 empty doors, leaving only one remaining.

"Then the host asks you: do you want to switch doors?"

"Would you switch this time?"

Jiang He thought briefly, "Switch."

Cai Zhiyuan asked, "Then why did you decide to switch this time?"

Jiang He thought with her head down, "Ten thousand doors, accurately selecting the car right away is almost impossible, the probability is one in ten thousand.

"The door I originally selected definitely doesn't have the car.

"So the car can only be behind the other door."

Cai Zhiyuan nodded, "Exactly. When the number of doors increases, this problem becomes easy to understand.

"No matter how the host opens doors, the original door's probability remains unchanged because it was selected from the start, but the probability of other doors increases.

"So returning to the original three-door problem: the door selected by the contestant has a $\frac{1}{3}$ probability of having the car. We view the other two doors as a whole, with a $\frac{2}{3}$ probability of having the car behind them.

"After the host eliminates one door, the collective probability of the two doors becomes equivalent to the probability of the other door having the car.

"That door's probability changes from $1/3$ to $2/3$."

Fu Chen understood and nodded slightly, looking thoughtful.

"So when this game reaches the last three shots, the television updates the rules, essentially becoming the 'three-door problem.'

"The fourth shot about to be fired is the originally selected door; the fifth shot is the door eliminated by the host, and the sixth shot is the remaining door.

"The host asking whether to switch doors is equivalent to the player deciding whether to switch the fourth shot to the sixth shot.

"From these two shots, choose the one with lower probability to shoot yourself, and the one with higher probability to shoot the innocent person."

Cai Zhiyuan praised, "Exactly, you're very smart, that's exactly right."

Everyone fell into brief silence, digesting what Cai Zhiyuan had just said.

After serious consideration, Fu Chen said, "Then according to this analysis, 'Redemption Roulette' is actually a game testing 'text sensitivity' and 'probability'?"

"But could it receive an S rating for just this reason?"

Li Renshu seemed to realize something. She looked at Cao Haichuan:

"Officer Cao, if you were a player in this game, do you think you could survive it?"

Cao Haichuan nodded matter-of-factly, "Yes."

Li Renshu agreed, "I think so too, and it shouldn't be because of any probability issues."

Cao Haichuan seemed to have a nicotine craving and subconsciously wanted to reach for cigarettes, but ultimately restrained himself.

"Yes, I thought about it. I could survive, but there's nothing particularly special about the reason. After all, I don't understand probability.

"I simply couldn't bring myself to point the gun at an innocent person."