Between intuition and logic, the Monty Hall problem

Consider the following problem:

> Suppose you're on a game show, and you're given the choice of three doors: Behind one door
> is a car; behind the others, goats. You pick a door, say No. 1, and the host, who knows what's
> behind the doors, is obliged to open another door that has a goat, say No. 3. He then says to
> you, "Do you want to pick door No. 2?" Is it to your advantage to switch your choice?

This famous problem is known as the "Monty Hall" problem. Steve Selvin, an American statistician
invented and solved this problem in 1975. In 1990, Marilyn vos Savant popularized this problem by
publishing it as the above quote in the magazine *Parade*. (I changed the quote a little bit for clarity.)
What is your answer to this question? Most people would answer that it doesn't matter at all
whether you switch your choice or not. However, it can be shown with high school mathematics
(also known as "middle school mathematics" in South Korea) that the chance of winning the car is
higher if you switch your choice.

The answer may seem counterintuitive to most people. Indeed, many readers sent letters to *Parade*
claiming that Savant's answer (which is correct) to the problem was wrong. However, assuming that
you have a solid understanding of high school math, if you follow the solution to the Monty Hall
problem step by step, by adhering to the logic, you will agree with the solution. The readers, who
wrote letters to the magazine, either didn't have a solid understanding of high school math or even
if they did their wrong intuition was so strong that they were unable to correct it by logic. The
opinion and the judgment of the many readers who wrote to *Parade* are useless if they are wrong.

In 2008, there was a huge protest against importing beef from the US in South Korea. The protesters
were concerned about mad cow disease. However, I supported importing American beef, after
reading an advertisement by the Korean government in newspapers; mad cow disease had been
reported only in certain age groups and certain body parts of cows, and the Korean government
was saying that it would only import beef from the other age groups and the other body parts.
However, even after this advertisement appeared in the newspapers, the protesters didn't calm
down at all. I was deeply and deeply confused. Haven't they read the advertisement? Why are they
still protesting?

Only much later did I realize that they are like the readers who wrote the letters to *Parade*; their
wrong intuition is so strong that they are not able to correct it by logic. Maybe they had attained
the wrong intuition after watching footage of cows with mad cow disease. Or, maybe they hate
America because it often abuses its power in diplomacy. Then, they slandered the people who
supported importing American beef, claiming they betrayed their country by putting the American
commercial interest before the health of South Korean people. But in reality, the people who

supported the import didn't betray their country. Nor were they unconcerned by mad cow disease. Nor did they endorse the abuse of American power.

I used to think that most people would be convinced if they were provided with facts and evidence and persuaded by logic. Then, I thought, they would be able to make or support correct political decisions. After all, I thought that understanding that there would be no chance of getting mad cow disease by eating American beef if it is imported in the way the South Korean government did was not hard at all. No. I was naïve. It is hard. Many people are not able to accept the solution to the Monty Hall problem, because they have such a strong wrong intuition. However, some good people, even though they may provide a wrong solution to the Monty Hall problem at first, can correct their wrong intuition by logic and accept the solution to the Monty Hall problem.