BEAUTIFUL ECONOMICS • BEHAVIORAL EXPERIMENTS

BEAUTY CONTEST

Guess what others will guess—
and think one step ahead.

THE STRATEGIC QUESTION

What number will win when everyone is thinking strategically?

0	25	50	75	100

A visual guide to strategic reasoning, expectations, and equilibrium

BEAUTIFUL ECONOMICS

01 / HOW TO PLAY

The rules are simple

The strategic challenge is not.

Imagine a group of players. Each person privately chooses a number between 0 and 100. The target is a fraction of the group's average choice. In the classic version, that fraction is two-thirds.

Winner: the player whose chosen number is closest to two-thirds of the average of all submitted numbers.

A quick example



Choices: 20, 40, 60, 80

Average = 50

Target = ⅔ × 50 ≈ 33.3

In this example, 40 is closest to the target (33.3), so the player who chose 40 wins.

Why is this not just a guessing game?

Your best choice depends on what you believe other people will choose. And their choices depend on what they believe you and everyone else will choose. This creates a chain of strategic reasoning.

02 / THINKING IN LEVELS

One step ahead

Your prediction about others changes your own number.

A simple reasoning ladder

LEVEL 0

Choose randomly or pick a salient number

Example: 50

LEVEL 1

Assume others choose around 50

⅔ × 50 ≈ 33

LEVEL 2

Assume others think at Level 1 and choose ~33

⅔ × 33 ≈ 22

LEVEL 3

Assume others think at Level 2 and choose ~22

⅔ × 22 ≈ 15

Key intuition: a player who thinks others are choosing lower numbers may also choose a lower number to stay close to the target.

The equilibrium prediction

Under common knowledge of rationality in the one-shot game, iterated reasoning drives choices toward 0: if everyone chooses 0, the average is 0 and the target is 0.

03 / WHAT THE GAME REVEALS

Rationality meets reality

The theoretical answer and observed choices need not coincide.

Equilibrium: 0 is the Nash equilibrium in the classic 0–100, two-thirds-average game. No player can get closer to the target by choosing a different number when everyone else chooses 0.

Limited reasoning Players may only think one or two steps ahead.

Why might people choose above zero?

Anchoring Numbers such as 50 may feel like a natural starting point.

Beliefs about others A player may expect others to be inexperienced or non-strategic.

Learning Choices can move downward across repeated rounds as players adapt.

Researcher's caution

The result depends on the exact rules: the target multiplier, choice range, group size,

Interpretation: the game is useful for studying strategic sophistication, beliefs about others, and learning—not simply intelligence.

04 / REFLECT & APPLY

Think like an economist

Explain the choice using beliefs and strategic steps.

Takeaway: in a beauty contest, your choice is strategic because the payoff depends on how your number compares with a target derived from everyone else's choices.

01 Why is 0 the equilibrium choice in the classic two-thirds-average game?

02 If you believe the average choice will be 45, what target number follows?

03 How could repeating the game change players' choices?

Further reading

• Nagel, R. (1995). Unraveling in guessing games: An experimental study. American Economic Review, 85(5), 1313–1326.

• Camerer, C. F. (2003). Behavioral Game Theory: Experiments in Strategic Interaction. Princeton University Press.