ECON 6110, Microeconomic Theory III	Section 12
TA: Ruqing Xu	April 18, 2025

1 Signaling Game

Consider the Spence's job-market signaling model with a discrete set of effort choices. The sender is a student, the receiver an employer. There are two types of students, defined by the value of their innate talent, $\theta \in \{2, 3\}$. Nature chooses θ with probability p that $\theta = 2$. The student chooses an effort level in college, $a_1 \in \{0, 1\}$. After observing a_1, the employer chooses a wage $a_2 \in [0, \infty)$. The student maximizes wage less cost of effort, the latter inversely related to talent:

$$v_1(a_1, a_2, \theta) = a_2 - \frac{ca_1}{\theta} \tag{1}$$

for some $c > 0$. The employer minimizes the expected squared difference between the wage and the student's innate talent.[1]

$$v_2(a_1, a_2, \theta) = -\mathbb{E}(a_2 - \theta)^2 \tag{2}$$

(a) Define a Bayesian extensive game with the information above. Specify the players, set of types, prior on types, player's actions, and utility functions. What are player's strategies and beliefs? Represent it with a graph.

(b) Does the above signaling game have a **separating PBE** where the low type chooses the low action and the high type chooses the high action?

(c) Does the above signaling game have a **separating PBE** where the low type chooses the high action and the high type chooses the low action?

(d) Does the above signaling game have a **pooling PBE** where both types chooses the low action?

(e) Does the above signaling game have a **pooling PBE** where both types chooses the high action?

(f) Does the above signaling game have a **semi-seperating PBE** where one type mixes?

[1] Note that the employer doesn't want to *underpay* the student either, perhaps because the student would then choose an alternative employer.