Sidney Julian and Emily Kuntzsch
Economics 355: Game Theory, Project Cover Sheet

Topic: Interaction of Blue Suits

Players:
• Nature
• Player 1 of the game
• Player 2 of the game
o Natural picks if Player 1 is two of the following: Played before (P) with probability (p=1/4) or Never played (N) with probability (1-p=3/4), and Player 1 could be a Friend (q=1/2) or Enemy (1-q=1/2).
o Player 2 doesn't know either of Player 1's types or the probabilities associated with either of Player 1's types; if Player 1's played before or not (P or N), and if Player 1's a friend or an enemy (F or E)

Strategies/Actions:
•1: Nature: Nature decides if Player 1 has played the game therefore knows the game with probability (p=1/4) or if Player 1 has never played the game therefore doesn't know the game with probability (1-p=3/4)
• 2: Nature: Nature decides if Player 1 is a Friend (F) with probability (p=1/2) or if Player 1 is an Enemy (E) with probability (1-p=1/2)
•3: Player 1: Player 1 chooses to share information with Player 2 (S) share or not share (D) given Player 1's type, Friend (F) or not (N) and type, paired with either played the game before (P) or not played before (N)
•4: Player 2: Player 2 chooses a shape which is either the best shape (B) or the worst shape (W), after Player 1 either shares information (S) or doesn't share (D), Player 2 unknowing of Player 1's types

Signaling: giving advice
•Player 1: If Player 2 believes that Player 1 is a Friend (F) and values helping Player 2, then Player 2 believes that Player 1 always has good intentions when choosing to share(S) or not share(D)
•Player 1: If Player 2 believes that Player 1 is an Enemy (E) and values deceiving Player 2, then Player 2 would believe that Player 1 always has bad intentions when choosing to share (S) or not share (D)

Parameters:
•g: Value when Player 2 picks the best shape (B)
•r: Value when Player 1 is an enemy and is able to deceive Player 1.

Description of Payoffs:
• Player 1:
• The type of Player (PF or PE or NF or NE) determines if Player 1's will share or not share good information and how that will affect the payoffs of both players▪ A Friend who's played before (PF) prefers to share (S) because the friend gets (warm glow) from trying to help Player 2
▪ An enemy prefers to deceive which means no matter if Player 2 ends of choices the worst or best option they gain r
▪ A worker gets a benefit (B) for working their preferred effort level.
•Player 2: If Player 2 values winning the game and picks the best shape (B), Player 2 gains (g)
•Player 2: If Player 2 wins by choosing the best shape (B) and Player 1 who's a friend(F) shared, both players gain (+8)

•Player 2: If Player 1 is ever the enemy and decided to share, Player 1 gains r because they deceived and Player 2 loses an amount, even if they gain g because they have been deceived

▪ **Assumptions:**

•All friends want to help

•All enemies want to deceive

•Shapes are either the best or the worse and leads to winning or not winning

Highlights from Results/Analysis:

• If W is dominated for player 2, then $g \geq 7$, NE: {(1357, B)}

•If B is dominated for player 2, then $g \leq 7$, NE: {(1357, W)}