Strategic Guilt Induction*

Eric Cardella†

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Abstract

Guilt averse agents are motivated to meet the expectations of others, even at the expense of their own material payoff. Several experimental studies have found results supporting guilt aversion in games. However, strategic implications of guilt aversion arise, which can impact economic outcomes in important ways, that have yet to be explored. I introduce an experimental design that admits the possibility for agents to strategically induce guilt upon others in a manner consistent with psychological insights of Baumeister, Stillwell, and Heatherton (1994). This enables me to test whether agents attempt to influence the behavior of others by strategically inducing guilt. Subsequently, I test whether guilt induction is an effective mechanism for influencing the behavior of others. Lastly, the design enables me to test whether agents exhibit higher degrees of trust when they are given an opportunity to induce guilt. Furthermore, I appeal to the Battigalli and Dufwenberg (2007) model of simple guilt and derive conditions under which effective guilt induction can be supported as an equilibrium of the psychological game considered.

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†Department of Economics, University of Arizona, McClelland Hall 401, PO Box 210108, Tucson, AZ 85721-0108, Telephone: (858) 395-6999; Email: ecardell@email.arizona.edu.
1 Introduction

A growing body of experimental literature suggest that economic agents making strategic decisions may not be solely motivated to maximize their own material payoffs. Battigalli and Dufwenberg (2007) (B&D henceforth) develop a model of “simple” guilt where agents suffer disutility, in the form of guilt, from letting others down.\(^1\) Their model posits that agents who are averse to feeling guilty may be motivated to comply with the expectations of other agents, even at the expense of their own material payoff. Behavior consistent with guilt aversion has been documented in several experimental studies.\(^2\) In light of the results from these experimental studies, it is important to consider the richer set of interpersonal strategic implications that can arise if agents are motivated by guilt aversion.

The guilt aversion of one agent can influence the strategic behavior of other agents in important ways. In certain strategic settings, the possibility may arise for agents to behave opportunistically and exploit the guilt aversion of others in self-serving ways. Charness and Dufwenberg (2006), in their concluding remarks, point to such a possibility and raise the question, “do people manipulate the guilt aversion of others in self-serving ways?”\(^3\) Given the opportunity, and incentive, agents could attempt to influence the behavior of guilt averse others by strategically inducing guilty feelings upon them. Consequently, agents who are motivated by guilt aversion might be more motivated to respond in kind an meet the expectations of those who induce guilt upon them, thus alleviating the guilty feelings. These interpersonal implications of guilt aversion can impact strategic decision making, and consequently, economic outcomes in important ways that have yet to be explored.

The goal of this study is to experimentally investigate these interpersonal implications of guilt aversion in a strategic setting. Specifically, this paper investigates the following three research questions: First, do economic agents attempt to exploit the guilt aversion of other agents in self-serving ways by strategically inducing guilt upon

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\(^1\)Dufwenberg (2002) develops a model of guilt applied to a specific game, the “Marital Investment Game”, while B&D develop a model of guilt for a general class of games. B&D also model a second form of guilt, “guilt from blame”, however, in this paper I will only consider simple guilt; therefore, for the remainder of the paper when I refer to the guilt model of B&D, I am implicitly referring to the model of simple guilt. The B&D model is an application of the authors’ more general framework developed in Battigalli and Dufwenberg (2009), which extends the psychological game theory framework pioneered by Geanakoplos, Pearce, and Stacchetti (1989).


\(^3\)Rabin (1993) raises a similar question, albeit in a more general context and not specifically in reference to guilt, about whether players may be able to “force” emotions in a sequential move game.
those other agents? Second, is strategic guilt induction an effective mechanism for influencing the behavior of other agents, i.e., do agents respond in kind to strategic guilt induction? Third, do agents exhibit more trusting behavior in strategic settings that features an opportunity to induce guilt upon other agents?

Although previously unexplored in the economic literature, the interpersonal implications of guilt aversion have been recognized and documented in the psychology literature (Vangelisti, Daly, and Rudnick (1991), Baumeister, Stillwell, and Heatherington (1994, 1995) (BSH henceforth), Tangney and Fischer (1995)). In particular, BSH (1994) investigate the functions of guilt and argue that one of the primary functions of guilt is to motivate the behavior of others. People can invoke or induce guilty feelings in others as a means of motivating others to behave more pleasingly. In their study, BSH (1994) note that “we observed ample evidence of the hypothesized function of guilt as an interpersonal influence technique: People induced guilt to get another person to comply with their wishes” (p. 249). Vangelisti et al. (1991) convey a similar sentiment by arguing that people induce guilt “primarily to achieve their own end-to persuade their listeners to do or not to do something” (p. 33).

The previous psychology literature provides valuable insights regarding the interpersonal functions of guilt. However, these studies, including BSH (1994) and Vangelisti et al. (1991), focus on the functions of guilt in social relationships, and draw insights primarily from personal narratives; Subjects in these studies were asked to recall times when they induced guilt upon others, and/or had guilt induced upon them. These interpersonal functions of guilt may not be restricted to social relationships. Guilt can also function as an “interpersonal influence technique” in strategic settings that can have important economic implications. An incentivized experimental game provides a suitable platform for investigating these interpersonal implications of guilt aversion in economic settings with strategic interaction.

The following example illustrates an economic setting, perhaps familiar to some, where strategic guilt induction could be employed as a means of influencing the behavior of another in a self-serving way.

Example 1 You are a homeowner and you hire a private contractor to complete an addition on your home by a pre-specified date. Shortly thereafter, the contractor has an opportunity to take on another well-paying job. However, the new job must be completed in a timely manner, and in order for the contractor to complete the new job on time, he must delay the completion of your addition by several weeks. The contractor, however, is unaware that you had planned for your in-laws to come stay in the new addition shortly after the original agreed upon completion date. Hence, the contractor is unaware of how much you would suffer if the addition is not completed on time and your in-laws are not able to visit and stay in the new addition. Anticipating the guilt aversion of the contractor, you decide to inform the contractor that your in-laws are coming into town and how much you would suffer as a result of the addition
not being completed by the original agreed upon date. To avoid the guilt the contractor would feel by delaying the projects completion, the contractor decides to work nights and weekends to complete the addition on time. As a result of your strategic guilt induction, the addition is completed on time and you get to spend a few wonderful weeks with your in-laws!

The example highlights a setting where strategic guilt induction could be used to influence the behavior of a guilt averse other. Manipulating the guilt feelings of others can also have important behavioral implications and impact outcomes in other, more general, economic settings. In the workplace, managers could possibly mitigate employee shirking by conveying to employees how their sub-standard effort adversely affects other employees.\(^4\) In contracting environments with unobservable actions and/or nonenforceability, guilt induction may allow a disadvantaged party to influence the behavior of an advantaged counter-party. In particular, a contracted firm making specific investments could possibly thwart re-contracting and hold-up by conveying to the counter-party firm the loss in profits associated with such a hold-up. In academia, guilt induction could help an assistant professor receive a more timely review decision on a submitted paper. The assistant professor could possibly motivate a guilt averse editor into making a more prompt review decision by gently informing the editor, at the time of submission, that his/her tenure review is approaching and a lengthy review period could hinder his/her tenure prospects.\(^5\) Many economic settings, like those mentioned, permit the possibility to induce guilt upon others. A deeper understanding of the interpersonal behavioral inferences of guilt aversion is required to accurately predict how guilt aversion impacts outcomes in such strategic settings.

In order to experimentally investigate whether agents strategically induce guilt upon others, and the effectiveness of strategic guilt induction, it is crucial to first identify how agents attempt to induce guilt upon others. For this, I draw valuable insights from BSH (1994) who posit the following prescription for how people induce guilt in others: “If Person A wants Person B to do something, A may induce guilt in B by conveying how A suffers over B’s failure to act in the desired fashion” (p. 247). This method for inducing guilt implicitly requires that Person A be privately informed about his own well-being, and have the possibility to convey such private information to Person B. Therefore, the chosen strategic setting must feature both private payoff information and the ability to convey the private payoff information. However, the previous experimental studies that have investigated guilt aversion in strategic settings mostly consider variations of 2-player “trust” games that do not

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\(^4\)Sub-standard effort by employees is likely to result in lower profits for a firm. Assuming that bonuses are increasing in firm profits, then lower profits would lead to lower bonuses for all employees. Thus, shirking by one employee could adversely affect the well-being of other employees.

\(^5\)This example was inspired by an editor who revealed to me that some assistant professors do actually inform the editor, at the time of submission, about such an upcoming tenure review!
feature private payoff information or the possibility to convey the private payoff information. The previously implemented experimental games used to investigate guilt aversion lack a rich enough strategic structure to investigate the research questions of interest in this study, hence a new experimental game is warranted.

I propose an experimental design that uses a 2-player trust game featuring both private payoff information and the opportunity to convey the private information. In the game, the privately informed first-mover (Player A) is given an opportunity to convey to the second-mover (Player B) how low his/her payoff would be as a result of Player B choosing an action that is undesirable for Player A. This effectively allows Player A to convey to Person B how much Player A would “suffer” over Player B’s failure to act in the desired fashion, which is consistent with the BSH (1994) method for inducing guilt. The use of this game allows me to derive hypotheses to test whether Player A attempts to strategically induce guilt upon Player B, and whether Player B is susceptible to strategic guilt induction. The design also uses a second, related, trust game that does not feature an opportunity for Player A to induce guilt upon Player B. This second game provides a baseline trust measure for Player A’s, which then allows me to derive a hypothesis to test if Player A’s are more trusting when they have an opportunity to induce guilt.

Furthermore, I theoretically explore the connection between the psychological insights of BSH (1994) regarding the interpersonal implications of guilt and the B&D model of guilt. In doing so, I apply the B&D model of guilt to the proposed experimental trust game. I derive conditions on beliefs under which the method for guilt induction, as posited by BSH (1994), is consistent with B&D. That is, I derive conditions on beliefs for which the B&D model predicts that Person A can induce guilt in Person B by conveying how low his payoff would be as a result of Person B choosing an undesirable action. Subsequently, I show that effective guilt induction can be supported as a sequential equilibrium of the proposed game under the framework of B&D.

The experimental results of this study suggest that Player A’s do not attempt to induce guilt upon Player B’s. However, the results suggest that guilt induction would have been effective. That is, Player B’s appear to be susceptible to strategic guilt

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6Fong, Huang, and Offerman (2007) consider an experimental trust game with private information. However, the authors incorporate private information as a means of testing their model of guilt driven reciprocity. Additionally, their trust game features private information for the second mover, while I consider a trust game with private information for the first mover.

7I use the term “induce guilt” when referring to Person A’s strategic attempt to influence the behavior of Person B by conveying how low his payoff would be given a future undesirable action of Person B. I do this to remain consistent with the psychological intuition and terminology outlined by BSH (1994). However, in relation to the B&D model of guilt aversion, it is more pedagogical to think of this strategic behavior from Person A as induced “counterfactual” guilt. Essentially, Person A is trying to increase the amount of guilt that Person B would feel as a result of choosing an action that is undesirable for Person A. This makes the guilt counterfactual in the sense that Person B may never experience the guilt if he chooses an action that complies with Person A’s desires.
induction. Lastly, the results suggest that having an opportunity to induce guilt does fosters more trusting behavior by Player As. After playing the experimental game, subjects were additionally asked to fill out a short questionnaire. The data from the questionnaire indicates that Player As, despite not having attempted to induce guilt upon Player B in the game, recognized that guilt could have been induced upon Player B. The questionnaire data also indicates that Player Bs are susceptible to guilt induction by Player A, which is consistent with the experimental findings.

The paper proceeds by introducing the experimental games and developing the three main research hypotheses in Section 2. I theoretically explore the connection between the research hypotheses and the B&D model of guilt in Section 3. I outline the experimental design in Section 4. Section 5 presents the experimental results and Section 6 concludes with discussion.

2 Hypothesis Development

In this section, I first introduce the two experimental trust games from which the research hypotheses are developed. I refer to both games as trust games because they feature a payoff structure indicative of the broader class of trust games. Namely, a game where the first mover has an opportunity to choose an action that creates the possibility of mutual benefit, if the other person cooperates, but a risk of lower payoffs to oneself if the other person defects. Such an action taken by the first mover is referred to as a trusting action (Cox (2004)). Trust games, in general, allow for the possibility of guilty feelings, which make them a suitable platform for developing hypotheses to test the research questions of this study.

2.1 Trust Game with Uncertain Payoffs – \( \Gamma_{UP} \)

\( \Gamma_{UP} \) is a 2-player, sequential move game. \( \Gamma_{UP} \) begins with the first mover, Player A, choosing between \textit{In} or \textit{Out}. If Player A chooses \textit{Out}, then the game ends; Player A receives a payoff of 6, and Player B receives a payoff of 2. If Player A chooses \textit{In}, then Player B is called upon to move. Player B must then choose between \textit{Left} or \textit{Right}. If Player B chooses \textit{Right}, then the game ends; Player A receives a payoff of 10, and Player B receives a payoff of 4. If Player B chooses \textit{Left}, then the game ends; Player A receives a payoff of \( X \), and Player B receives a payoff of 6. \( X \) is a random variable where \( \text{prob}(X = 0) = 1/2 \) and the \( \text{prob}(X = 6) = 1/2 \). At the start of the game, the distribution of \( X \) is known to both players. The extensive form of \( \Gamma_{UP} \) is depicted below in Figure 1.
2.2 Trust Game with Private Payoffs – $\Gamma_{PP}$

$\Gamma_{PP}$ features a similar strategic structure and payoffs to those of $\Gamma_{UP}$, with two important differences. First, $\Gamma_{PP}$ features an opportunity for Player A to become privately informed about the value of $X$. Second, $\Gamma_{PP}$ features an additional stage where Player A has the opportunity to credibly convey his private information about the value of $X$ to Player B.

$\Gamma_{PP}$ begins analogously to $\Gamma_{UP}$ with Player A first choosing between In or Out. If Player A chooses Out, the game ends; Player A receives a payoff of 6, and Player B receiving a payoff of 2. If Player A choose In, Nature then decides whether Player A becomes privately informed about the value of $X$. With prob = $4/5$, Nature Reveals (Rev) the value of $X$ to Player A, and with prob = $1/5$, Nature does Not Reveal (Not Rev) the value of $X$ to Player A.

If the value of $X$ is revealed to Player A, then an additional stage arises where Player A must decide whether to credibly Convey (C) on Not Convey (NC) the value of $X$ to Player B before Player B gets the move. Upon getting the move, Player B must then decide between Left or Right. Analogous to $\Gamma_{UP}$, if Player B chooses Right, then the game ends; Player A receives a payoff of 10, and Player B receives a payoff of 4. If Player B chooses Left, the game ends; Player A receives a payoff of $X$, and Player B receives a payoff of 6, where $X$ is again a random variable with prob($X = 0$) = $1/2$ and the prob($X = 6$) = $1/2$. The extensive form of $\Gamma_{PP}$ is depicted below in Figure 2.
To simplify the extensive form, the two moves by Nature, determining the value of X and determining whether the value of X is revealed to Player A, have been combined into one move by Nature.

If players are “selfish”, i.e., act to maximize their own material payoff, then the unique equilibrium outcome in both $\Gamma_{UP}$ and $\Gamma_{PP}$ is Player A chooses $Out$. To see this, note that it is dominant for Player B to choose $Left$ in both $\Gamma_{UP}$ and $\Gamma_{PP}$. As a result, it is sequentially rational for a selfish Player A to choose $Out$ in both $\Gamma_{UP}$ and $\Gamma_{PP}$, and the unique equilibrium outcome is Player A chooses $Out$. The inclusion of private information and the additional conveyance stage for Player A in $\Gamma_{PP}$ has no impact on the equilibrium outcome assuming selfish players. However, it is exactly these two features of $\Gamma_{PP}$ that will allow me to derive testable hypotheses regarding whether agents attempt to induce guilt, and its subsequent effectiveness.

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8In $\Gamma_{PP}$, there is multiplicity of Perfect Baysian Equilibria for selfish players that depend on the specification of Player B’s beliefs at the information set where no information is conveyed regarding the value of X. However, regardless of Player B’s beliefs, it is rational for him to choose $Left$ and subsequently, it is sequentially rational for Player A to choose $Out$. Therefore, the unique equilibrium outcome of $\Gamma_{PP}$ is the game ending with Player A choosing $Out$. 

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Before I proceed, I first highlight two important features of $\Gamma_{PP}$ that will be relevant for the upcoming derivation of the research hypotheses and the application of the B&D model of guilt. First, Player A must choose between In or Out before possibly becoming informed about the value of $X$. This eliminates any possible signaling value regarding the value of $X$ inferred from Player A’s decision of In or Out. Additionally, the value of $X$ is revealed to Player A who choose In only with prob $= 4/5$. Therefore, if the value of $X$ is not conveyed to Player B, then Player B is unable to perfectly distinguish between whether the value of $X$ was not revealed to Player A, or the value of $X$ was revealed and Player A chose to Not Convey. As a result, if the value of $X$ is not conveyed to Player B, then Player B’s expectation of the value of $X$ will be strictly greater than zero and strictly less than six. More precisely, $\hat{m}_A \in [1, 5]$ where $\hat{m}_A$ denotes Player B’s expectation of $X$, conditional on the value of $X$ not being conveyed. The notational choice of $\hat{m}_A$ anticipates the upcoming application of the B&D model of guilt aversion.

### 2.3 Research Hypotheses

The first motivation of this study is to investigate whether agents attempt to strategically induce guilt upon others. Recall that BSH (1994) posit that a person can induce guilt upon another by conveying to that person how one suffers over that person’s failure to act in the desired fashion. Let us consider how this method of guilt induction relates to $\Gamma_{PP}$. Conditional on choosing In, a Player A would “desire” Player B to choose Right yielding him a payoff of 10 compared to a payoff of $X < 10$ if Player B were to choose Left. The extent to which Player A would “suffer” from Player B’s failure to choose Right depends on the value of $X$; the lower $X$ the lower Player A’s payoff and the more Player A would suffer. Given the opportunity, the BSH (1994) method for inducing guilt would posit that Player A could induce guilt upon Player B by “conveying” to Player B a low value of $X$, i.e., by conveying to Player B how much he would suffer if Player B were to choose Left.

After Player A has chosen In in $\Gamma_{PP}$, then either (1) $X = 0$ is revealed, (2) $X = 6$ is revealed, or (3) the value of $X$ in not revealed. If the value of $X$ in not revealed, then Player A has no more decisions to make. However, the value of $X$ is revealed, then Player A must decide whether or not to convey the value of $X$ to Player B. In the case where $X = 0$ is revealed, if Player A chooses to Convey $X = 0$, then Player B will know that if he chooses Left, Player A will receive a payoff of $X = 0$. Whereas,

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To see this, note that the largest expectation that Player B could hold regarding the value of $X$ is if he thinks that only a Player A who learned that $X = 6$ would choose to Not Convey. In this case, $\hat{m}_A$ is bounded above by $\frac{4}{5} \cdot E[X] + \frac{1}{5} \cdot 6 = \frac{4}{5} \cdot 3 + \frac{1}{5} \cdot 6 = 5$. Here, $\frac{4}{5}$ and $\frac{1}{5}$ represent the updated probabilities, via bayes rule, that Player A did not learn the value of $X$ and Player A learned that the value of $X = 6$, respectfully. By a similar argument, the smallest expectation that Player B could hold regarding the value of $X$ is if he thinks only a Player A who learned $X = 0$ would choose to Not Convey. In this case, $\hat{m}_A$ is bounded below by $\frac{1}{5} \cdot E[X] + \frac{4}{5} \cdot 0 = \frac{1}{5} \cdot 3 + \frac{4}{5} \cdot 0 = 1$. Therefore, $\hat{m}_A \in [1, 5]$. 

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if Player A chooses to Not Convey $X = 0$, then Player B will think that if he chooses Left, Player A will receive a payoff of $\hat{m}_A \in [1,5]$. Analogously, consider the case where the value of $X = 6$ is revealed. If Player A chooses to Convey $X = 6$, then Player B will know that if he chooses Left, Player A will receive a payoff of $X = 6$. Whereas, if Player A chooses to Not Convey $X = 6$, Player B will think that if he chooses Left, Player A will receive a payoff of $\hat{m}_A \in [1,5]$.

In $\Gamma_{PP}$, Player B will think that Player A suffers more from his choice of Left if $X = 0$ is conveyed, compared to if the value of $X$ is not conveyed. Similarly, Player B will think that Player A suffers more from his choice of Left if the value of $X$ is not conveyed, compared to if $X = 6$ is conveyed. Therefore, an opportunistic Player A who is attempting to strategically induce guilt upon Player B would Convey $X = 0$, and Not Convey $X = 6$. This leads to the first testable hypothesis:

**H1**: Conditional on choosing In and learning the true value of $X$, the proportion of Player As who Convey $X = 0$ in $\Gamma_{PP}$ is larger that the proportion of Player As who Convey $X = 6$.\textsuperscript{10}

In the subsequent section, I apply the B&D model of guilt to $\Gamma_{PP}$. I will show that, under certain conditions on beliefs of Player B, the B&D model posits that Player B will suffer more guilt from choosing Left if $X = 0$ is conveyed, compared to if the value of $X$ is not conveyed. Similarly, Player B will suffer more guilt from choosing Left if the value of $X$ is not conveyed, compared to if $X = 6$ is conveyed. This implies that the hypothesis that Player A can attempt to induce guilt upon Player B by choosing to Convey $X = 0$ and Not Convey $X = 6$ in $\Gamma_{PP}$, is consistent with the B&D model of guilt. I will further show that inducing guilt by choosing to Convey $X = 0$ and Not Convey $X = 6$ can be supported in an equilibrium of $\Gamma_{PP}$ if Player B is sufficiently averse to feeling guilty.

The second motivation of this study is to investigate whether guilt induction is effective. That is, are agents more motivated to respond in kind after guilt has been induced upon them? BSH (1995) posit that after Person A has induced guilt in Person B, “Person B finds the guilt aversive and, to escape from guilt, complies with A’s wishes” (pp. 247). It is also possible, however, that a guilt averse Player B will recognize that Player A is trying to manipulate his behavior by “guilting” him, which can result in Player B being more motivated to choose the unkind action of Left in response to Player A’s attempted guilt induction. BSH (1994) (1995) document this potential “cost” of guilt induction by arguing that target of guilt

\textsuperscript{10}BSH (1994) note that guilt results from hurting others, thus a person may suffer guilt from inducing guilt. The authors refer to this type of guilt from inducing guilt as “metaguilt”. It is possible that Player A could therefore suffer metaguilt from conveying $X = 0$ and not conveying $X = 6$. These metaguilty feelings could then motivate Player A to Not Convey $X = 0$ and to Convey $X = 6$. However, this potential metaguilt effect is in the opposite direction of [H1], which would not give rise to a possible confounding effect.
induction (Person B) might feel resentment and be motivated to respond negatively toward the guilt inducer (Person A).\textsuperscript{11} Hence, attempted guilt induction by Player A may be counterproductive as a means of motivating Player B to choose Right as it may foster more selfish behavior and motivate Player B to choose Left, contrary to Player A’s intended motivation.

In relation to $\Gamma_{PP}$, Player B complying with Player A’s wishes corresponds to Player B choosing Right. Therefore, if guilt induction by Player A is an effective influence mechanism, then Player B would be more motivated to choose Right after Player A induces guilt by choosing to Convey $X = 0$ and Not Convey $X = 6$. This leads to the second testable hypothesis:

**H2:** Conditional on Player A choosing In, the proportion of Player Bs choosing Right after $X = 0$ is conveyed in $\Gamma_{PP}$ is larger than when no the value of $X$ is not conveyed.\textsuperscript{12}

The third motivation of this study is to investigate whether having the opportunity to induce guilt fosters more trusting behavior. Comparing $\Gamma_{UP}$ and $\Gamma_{PP}$, we can see that the differences between $\Gamma_{UP}$ and $\Gamma_{PP}$ are the possibility for Player A to become privately informed about the value of $X$, and the ability to convey the learned value of $X$ to Player B prior to Player B’s move. As I have argued, it is these differences that provide the opportunity to Player A to induce guilt in Player B. When playing $\Gamma_{PP}$, compared to $\Gamma_{UP}$, Player A, after having chosen In, can attempt to induce guilt in Player B by choosing to Convey $X = 0$ and Not Convey $X = 6$. Therefore, if having an opportunity to induce guilt fosters more trusting behavior, then Player As would be more motivated to choose In in $\Gamma_{PP}$, compared to $\Gamma_{UP}$.\textsuperscript{13} This leads to the following testable hypothesis:

**H3:** The proportion of Player As who choose In when playing $\Gamma_{PP}$ In is larger than the proportion of Player As who choose In when playing $\Gamma_{UP}$.

\textsuperscript{11}Alternatively, this intuition could also be viewed as some kind of negative reciprocity. A guilt averse Person B may view Person A’s attempted guilt induction as an “unkind” action. As a result, Person B may be more motivated to reciprocate with the “unkind” action of choosing Left back toward Person A.

\textsuperscript{12}Note, I only consider the response of Player B after $X = 0$ is conveyed and when the value of $X$ is not conveyed. I do this because a Player A who learns that $X = 6$ and is trying to induce guilt, would Not Convey $X = 6$. Therefore, it is not meaningful to investigate the effectiveness of guilt induction by looking at Player B’s response after $X = 6$ is conveyed.

\textsuperscript{13}In both games Player A can guaranty himself a payoff of 4 by choosing Out. However, if Player A chooses In, then Player A will earn a payoff of 3 (on average) if Player B chooses Left and a payoff of 8 if Player B chooses Right. Thus, an In choice by Player A can be viewed as trusting behavior in the sense that Player A is trusting that Player B will not choose Left, which results in a lower payoff to Player A than what he could have earned by choosing Out. The interpretation is that Player A is trusting the Player B will choose Right. This notion of trust by Player A is inline with the definition of trust presented in Cox (2004).
I conclude this section by addressing a plausible, and widely known, alternative behavioral motivation for Player B – inequity aversion. The inequity aversion models (Fehr and Schmidt (1999) and Bolton and Ockenfels (2000)) posit that agents are averse to inequitable outcomes, both advantageous and disadvantageous. In many trust games, inequity aversion can motivate the second mover (Player B) to choose the more kind action (Right), as it generally results in a more equitable outcome. However, the experimental design anticipates and controls for possible inequity aversion of Player B's. Specifically, an inequity averse Player B playing $\Gamma_{PP}$ always prefers to choose Left, regardless of the value of $X$ and Player B's sensitivity to inequitable outcomes.\textsuperscript{14} It follows that Player A's conveyance decision regarding the value of $X$ in $\Gamma_{PP}$ cannot be explained by any strategic considerations regarding the inequity aversion of Player B.\textsuperscript{15}

\section{B&D Model of Guilt Applied to $\Gamma_{PP}$}

In this section, I explore the connection between the psychological insights of BSH (1994) regarding guilt induction and the B&D model of guilt. In doing so, I first provide a brief outline of the general B&D model of guilt, followed by its application to $\Gamma_{PP}$. I then derive conditions under which the BSH (1994) method of inducing guilt is consistent with predictions of the B&D model of guilt. I conclude the section by showing that guilt induction can be supported as an equilibrium in $\Gamma_{PP}$ under the framework of B&D.

\subsection{Outline of B&D Model of Guilt}

B&D formally model two types of guilt for a general class of extensive form games, simple guilt and guilt from blame. I only consider the former applied to $\Gamma_{PP}$, thus, I restrict my analysis to simple guilt.\textsuperscript{16} What follows is only a simplified outline of the

\textsuperscript{14}The intuition is relatively straightforward. When Player B chooses Left, his payoff increases and the outcome becomes less inequitable. Therefore, it is optimal for an inequity averse Player B to always choose Left. Take, for example, the Fehr and Schmidt (1999) model of inequity aversion. For an inequity averse Player B, the payoff vector $(X, 6)$ is always preferred to the payoff vector $(10, 4)$ $\forall X \in [0, 6]$. To see this note that for the extreme case where $X = 0$, we have that $6 - \beta(6 - 0) > 4 - \alpha(10 - 4) \forall \beta \in [0, 1]$ and $\alpha \geq \beta$, where the LHS represents an inequity averse Player B's utility from choosing Left and the RHS represents the utility from choosing Right. For the other extreme case where $X = 6$, we have that $6 > 4 - \alpha(10 - 4) \forall \alpha \geq 0$, where the LHS represents an inequity averse Player B's utility from choosing Left and the RHS represents the utility from choosing Right. The assumptions that $\beta \in [0, 1]$ and $\alpha \geq \beta$ are assumed apriori in the model.

\textsuperscript{15}It is possible that Player A may be motivated by his own inequity aversion. Although I do not consider this in the derivation of the hypotheses, I do address this possibility when I present and discuss the experimental results.

\textsuperscript{16}With simple guilt, an agent suffers disutility proportional to how much he/she lets down another agent. Whereas with guilt from blame, an agent suffer disutility proportional to how much the other agent blames him for being let down. Thus, the main difference between the two models is the
model; Interested readers should refer to B&D for the full, technical presentation of both models including illustrative examples. Informally, the model posits that agents suffer disutility, in the form of guilt, from failing to live up to others’ expectations. This is captured by modeling an agent’s utility as a function of his own material payoffs, and the extent to which he let other agents down.

Formally, simple guilt is modeled by specifying a utility function for player i given by:

\[ u_{SG}^i = m_i - \sum_{j \neq i} \theta_{ij} \cdot D_j \]  
(Simple Guilt Utility)

In this expression, \( m_i \) represents player i’s material payoff, and \( \sum_{j \neq i} \theta_{ij} \cdot D_j \) represents player i’s disutility from simple guilt. The latter component is composed of two pieces. The first, \( \theta_{ij} \), is an exogenously given constant that measures player i’s sensitivity toward feeling guilty. The second, \( D_j \), represents the amount by which player i lets player j down, as a result of player i’s strategy. \( D_j = E_j - m_j \) is expressed as the difference between the material payoff that player j was expecting, \( E_j \), and the material payoff that player j actually receives, \( m_j \).\(^{17}\) \( E_j \) itself is a function of player j’s strategy, and player j’s vector of “first-order” beliefs regarding the strategies of the other players. Note, player i does not actually observe \( D_j \), as it is a function of player j’s first-order beliefs. Therefore, it is assumed that player i maximizes the expected value of \( u_{SG}^i \), given player i’s first-order beliefs regarding player j’s strategy, and player i’s “second-order” belief regarding player i’s first-order beliefs.

### 3.2 Guilt Applied to \( \Gamma_{PP} \)

I proceed with the application of the B&D model of simple guilt to \( \Gamma_{PP} \).\(^{18}\) In particular, I derive the guilt that Player B would experience from choosing Left in \( \Gamma_{PP} \). When Player B is called upon to move, there are three possible histories that Player B could observe. The first is that \( X = 0 \) was conveyed, which I denote \( C^0 \). The second is that \( X = 6 \) was conveyed, which I denote \( C^6 \). The third is that the value of \( X \) was not conveyed, which I denote \( C^N \). Henceforth, I refer to these three possible histories.

\(^{17}\)More precisely, B&D model the utility from simple guilt as \( u_{SG}^i = m_i - \sum_{j \neq i} \theta_{ij} \cdot G_{ij} \). In this expression, \( G_{ij} = D_j - \min_{k \neq i} D_j \) measures the unavoidable amount by which player i lets down player j. However, in relation to \( \Gamma_{PP} \), \( G_{ij} \) is equivalent to \( D_j \) so I opt to use the more simple notation.

\(^{18}\)The guilt aversion model could be applied to \( \Gamma_{UP} \) as well. However, the hypotheses that I develop regarding attempted guilt induction and the effectiveness of guilt induction apply only to \( \Gamma_{PP} \). Therefore, I only consider the guilt aversion model applied to \( \Gamma_{PP} \). \( \Gamma_{UP} \) is included in the experimental design solely to investigate whether having an opportunity to induce guilt affects trusting behavior as described in the previous Section.
as the three possible conveyance states. A strategy for Player B can be represented as a probability distribution over Player B’s possible actions, \{Left, Right\}, at each of the three possible conveyance states.

In deriving the guilt that Player B would suffer from choosing Left, it is necessary to first derive Player A’s material expectation. Before Player A makes her initial In or Out decision, Player A forms an initial first-order belief regarding Player B’s strategy. WLOG, Player A’s initial first-order beliefs can be represented as the probabilities that Player B would choose Right at each of the three conveyance states, which I denote \(\alpha_A = (\Pr(Right|C^0), \Pr(Right|C^N), \Pr(Right|C^6))\). For a given strategy, Player A forms an expectation, weighted over \(\alpha_A\) and moves by Nature, of his material payoff. I denote Player A’s initial material expectation \(E_A\).

Player B experiences disutility from simple guilt when he fails to live up to Player A’s expectations i.e. chooses a strategy that yields a payoff to Player A that is lower than \(E_A\). However, when Player B is called upon to move, he does not observe \(E_A\). Player B must then form an expectation regarding \(E_A\), conditional on the conveyance state. This conditional expectation is a function of Player B’s conditional second-order beliefs regarding \(\alpha_A\), which I denote \(\beta_B\). I define \(E_B|h\) where \(h \in \{C^0, C^N, C^6\}\) as Player B’s expectation of \(E_A\), conditional on the conveyance state. The guilt that Player B would suffer from choosing Left is proportional to the difference between \(E_B|h\) and \(m_A\), where \(m_A\) the material payoff that Player A actually receives as a result of Player B’s Left decision. Let \(\theta_B \geq 0\) denote Player B’s sensitivity to feeling guilty. Below, I derive Player B’s utility, including simple guilt, from choosing Left at each of the three possible conveyance states.

**X = 0 was conveyed:** Because the conveyance is credible, Player B knows that if he chooses Left, Player A will receive a payoff of \(m_A = 0\). Player B’s expectation of Player A’s expectation is \(E_B|C^0\). By choosing Left, Player B will suffer disutility from guilt equal to \(\theta_B \cdot (E_B|C^0 - 0)\). Thus, Player B’s utility from choosing Left, after \(X = 0\) was conveyed, is equal to:

\[
6 - \theta_B \cdot (E_B|C^0 - 0)
\]

**X = 6 was conveyed:** Because the conveyance is credible, Player B knows that if he chooses Left, Player A will receive a payoff of \(m_A = 6\). Player B’s expectation of Player A’s expectation is \(E_B|C^6\). By choosing Left, Player B will suffer disutility from guilt equal to \(\theta_B \cdot (E_B|C^6 - 6)\). Thus, Player B’s utility from choosing Left, after \(X = 0\) was conveyed, is equal to:

\[
6 - \theta_B \cdot (E_B|C^6 - 6)
\]
Value of $X$ not conveyed If the value of $X$ is not conveyed, then Player B must think about the expected material payoff that Player A would receive if he chooses Left. Let $\hat{m}_A = E_B[m_A|C^N]$ denote this expectation. In calculating $\hat{m}_A$, Player B must think about the relative probability that (1) Player A learned $X = 0$ and chose Not Convey, (2) Player A learned $X = 6$ and chose Not Convey, and (3) Player A did not learn the value of $X$. Although these probabilities are unobservable to the researcher and, thus, the exact value of $\hat{m}_A$ is unobservable, it is possible to identify bounds on $\hat{m}_A$. Specifically, $\hat{m}_A \in [1, 5]$ as I previously shown. Player B’s expectation of Player A’s expectation is $E_B|C^N$. By choosing Left, Player B will suffer disutility from guilt equal to: $\theta \cdot (E_B|C^N - \hat{m}_A)$ where $\hat{m}_A \in [1, 5]$. Thus, Player B’s utility from choosing Left, after the value of $X$ was not conveyed, is equal to:

$$6 - \theta_B \cdot (E_B|C^N - \hat{m}_A) \text{ where } \hat{m}_A \in [1, 5]$$

### 3.3 Theoretical Consistency with BSH (1994)

BSH (1994) argue that guilt is induced by conveying to another how one suffers when the other fails to act in a desired fashion. In relation to $\Gamma_{PP}$, the BSH (1994) method of inducing guilt would correspond to Player A choosing to Convey $X = 0$, and choosing to Not Convey $X = 6$. Is the BSH (1994) method of guilt induction consistent with the B&D model of simple guilt? That is, does the B&D model predict that Player B would suffer more guilt from choosing Left when $X = 0$ was conveyed compared to when the value of $X$ was not conveyed? Similarly, does the model predict that Player B would suffer more guilt from choosing Left when the value of $X$ was not conveyed compared to when $X = 6$ was conveyed? These questions can both be conditionally answered in the affirmative. I proceed by deriving conditions under which the BSH (1994) method for inducing guilt is consistent with the prediction of the B&D model of simple guilt.

First recall that the disutility from guilt that Player B would suffer from choosing Left at each of the three possible conveyance states, as predicted by the B&D model, can be summarized as follows:

- $X = 0$ was conveyed: $\theta_B \cdot (E_B|C^0 - 0)$
- $X = 6$ was conveyed: $\theta_B \cdot (E_B|C^6 - 6)$
- Value of $X$ not conveyed: $\theta_B \cdot (E_B|C^N - \hat{m}_A)$ where $\hat{m}_A \in [1, 5]$
According to B&D, Player B would suffer more disutility from choosing \textit{Left} when $X = 0$ was conveyed, compared to when the value of $X$ was not conveyed, when:

$$\theta_B \cdot (E_B|C^0 - 0) \geq \theta_B \cdot (E_B|C^N - \hat{m}_A) \implies E_B|C^0 \geq E_B|C^N - \hat{m}_A \quad \text{(Condition \#1)}$$

Similarly, Player B would suffer more disutility from choosing \textit{Left} when the value of $X$ was not conveyed, compared to when $X = 6$ was conveyed, when:

$$\theta_B \cdot (E_B|C^N - \hat{m}_A) \geq \theta_B \cdot (E_B|C^6 - 6) \implies E_B|C^N - \hat{m}_A \geq E_B|C^6 - 6 \quad \text{(Condition \#2)}$$

Because $\hat{m}_A \in [1, 5]$, we can derive a set of necessary and sufficient conditions on $E_B|h$ under which guilt induction, as prescribed by BSH (1995), is consistent with B&D. The two conditions that are necessary for guilt induction by Player A upon Player B in $\Gamma_{PP}$ are:

$$E_B|C^0 \geq E_B|C^N - 5 \quad \text{(Necessary Condition \#1)}$$

$$E_B|C^N \geq E_B|C^6 - 5 \quad \text{(Necessary Condition \#2)}$$

The two conditions that are sufficient for guilt induction by Player A upon Player B in $\Gamma_{PP}$ are:

$$E_B|C^0 \geq E_B|C^N - 1 \quad \text{(Sufficient Condition \#1)}$$

$$E_B|C^N \geq E_B|C^6 - 1 \quad \text{(Sufficient Condition \#2)}$$

Essentially, Condition 1 states that Player B’s second-order belief of Player A’s expectation after $X = 0$ is conveyed, $E_B|C^0$, is not \textit{too} much lower than Player B’s second-order belief of Player A’s expectation after the value of $X$ is not conveyed, $E_B|C^N$. Similarly, Condition 2 states that Player B’s second-order belief of Player A’s expectation after the value of $X$ is not conveyed, $E_B|C^N$, is not \textit{too} much lower than Player B’s second-order belief of Player A’s expectation after $X = 6$ is conveyed, $E_B|C^6$. Conditions 1 and 2 would certainly be satisfied if we assumed that Player B does not update his belief of Player A’s expectation, i.e. $E_B|C^0 = E_B|C^N = E_B|C^6$. Such an assumption would be satisfied in an equilibrium as I will discuss in the subsequent section. However assuming that $E_B|C^0 = E_B|C^N = E_B|C^6$ is clearly stronger than is needed for Condition 1 and 2 to be satisfied.\textsuperscript{19}

If Conditions 1 and 2 are satisfied, then the B&D model predicts that Player B would feel more guilt from choosing \textit{Left} after $X = 0$ was conveyed and the value of $X$ was not conveyed, compared to when the value of $X$ was not conveyed and $X = 6$.

\textsuperscript{19}Conditions 1 an 2 are a function of both Player B’s updated second-order belief of Player A expectation, and Player B’s belief about the value of X when the value of X is not conveyed. Although these conditions can’t be empirically verified for each individual Player B, it is possible to verify these conditions on the aggregate level.
was conveyed, respectively. Therefore, if Condition 1 and 2 hold, then according to the B&D model, Player A can induce guilt upon Player B by choosing to Convey $X = 0$ and Not Convey $X = 6$, which is consistent with the BSH (1994) method for inducing guilt.

### 3.4 Guilt Induction as an Equilibrium of $\Gamma_{PP}$

The primary motivation of the study is to experimentally investigate whether agents strategically induce guilt upon others, and whether agents respond in kind to strategic guilt induction. These are questions related to behavioral motivations in games that are independent of any equilibrium supposition. Nevertheless, it is an important question whether such behavior can be supported as an equilibrium of $\Gamma_{PP}$ under the guilt framework of B&D. It is the case that guilt induction by Player A, and a kind response to guilt induction by Player B, can be supported as sequential equilibria of $\Gamma_{PP}$ (Battigalli and Dufwenberg (2009)).

The intuition behind this rests in the fact that in an equilibrium, an assessment (profile of behavioral strategies and conditional hierarchical beliefs), will be consistent. Battigalli and Dufwenberg show that in an equilibrium, “players never change their beliefs about the conditional beliefs that the opponents would hold at each h (history)” (pp. 16). Thus in an equilibrium, there is no belief updating. It follows that $E_B|C^0 = E_B|C^N = E_B|C^6$, which implies that Conditions 1 and 2 from above would be satisfied in an equilibrium.

As I have shown, guilt induction by Player A is characterized by the choice to Convey $X = 0$ and Not Convey $X = 6$. Therefore, the strategy (In, Convey $X = 0$, Not Convey $X = 6$) for Player A is consistent with attempted guilt induction. Effective guilt induction is characterized by Player B choosing Right as a response to the guilt induction by Player A. The following two strategies for Player B are consistent with responding in kind to Player A’s guilt induction: (Right|$C^0$, Right|$C^N$, Left|$C^6$), and (Right|$C^0$, Left|$C^N$, Left|$C^6$). Thus, the strategy profiles ((In, Convey $X = 0$, Not Convey $X = 6$), (Right|$C^0$, Right|$C^N$, Left|$C^6$)), and ((In, Convey $X = 0$, Not Convey $X = 6$), (Right|$C^0$, Left|$C^N$, Left|$C^6$)) are the candidate equilibrium profiles for effective guilt induction in $\Gamma_{PP}$. I proceed by showing that each can be supported as an equilibrium of $\Gamma_{PP}$.

**Claim 1** The strategy profile ((In, Convey $X = 0$, Not Convey $X = 6$), (Right|$C^0$, Right|$C^N$, Left|$C^6$)) can be supported as an equilibrium of $\Gamma_{PP}$ for $\theta_B \in [\frac{3}{5}, \frac{1}{2}]$

To verify that this strategy profile is an equilibrium, we need to check that neither player has a profitable deviation. For Player A, this is rather trivial. By following the equilibrium strategy, Player A earns a payoff of 10, which is the highest payoff of

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20I refer the reader to the original paper for a formal equilibrium analysis of dynamic psychological games. The authors extend the concept of sequential equilibrium by incorporating hierarchies of conditional beliefs.
the game. Therefore, Player A has no profitable deviations. For Player B, we need to consider deviations at each of the possible conveyance states. Given consistent beliefs in equilibrium, we have that $\alpha_A = \beta_B = (1, 1, 0)$, $E_A = E_B|h = 10 \forall h \in \{C^0, C^N, C^6\}$, and $\hat{m}_A = 5$. Player B will not deviate to $Right|C^6$ so long as: $6 - \theta_B \cdot [10 - 6] \geq 4 \iff \theta_B \leq \frac{2}{3}$. Player B will not deviate to $Left|C^N$ so long as: $4 \geq 6 - \theta_B \cdot [10 - 5] \iff \theta_B \geq \frac{5}{6}$. Similarly, Player B will not deviate to $Left|C^0$ so long as: $4 \geq 6 - \theta_B \cdot [10 - 0] \iff \theta_B \geq \frac{1}{5}$ which is satisfied if $\theta_B \geq \frac{2}{5}$.

Claim 2 The strategy profile $((In, Convey X = 0, Not Convey X = 6), (Right|C^0, Left|C^N, Left|C^6))$ can be supported as an equilibrium of $\Gamma_{PP}$ for $\theta_B \in [\frac{2}{5}, 1]$

Again, to verify that this strategy profile is an equilibrium, we need to check that neither player has a profitable deviation. For Player A, playing the equilibrium strategy yields an expected payoff of 6.75, therefore Player A cannot profitable deviate to $Out$. Player A would not deviate and $Not Convey X = 0$ which would result in a payoff of 0 compared to a payoff of 10 from following the equilibrium strategy to $Convey X = 0$. Player A is indifferent between $Convey X = 6$ and $Not Convey X = 6$. Therefore, Player A has no profitable deviations from the prescribed equilibrium strategy. For Player B, we need to consider deviations at each of the possible conveyance states. Given consistent beliefs in equilibrium, we have that $\alpha_A = \beta_B = (1, 0, 0)$, $E_A = E_B|h = 7 \forall h \in \{C^0, C^N, C^6\}$, and $\hat{m}_A = 5$. Player B will not deviate to $Right|C^6$ so long as: $6 - \theta_B \cdot [7 - 6] \geq 4 \iff \theta_B \leq 2$. Player B will not deviate to $Right|C^N$ so long as: $6 - \theta_B \cdot [7 - 5] \geq 4 \iff \theta_B \leq 1$. Similarly, Player B will not deviate to $Left|C^0$ so long as: $4 \geq 6 - \theta_B \cdot [7 - 0] \iff \theta_B \geq \frac{2}{7}$.

Claim 1 and 2 show that strategic guilt induction can be supported as an equilibrium of $\Gamma_{PP}$ under the formal guilt framework of B&D. I acknowledge that an equilibrium supposition, especially when a game features multiple equilibrium, is a rather strong notion. However, an equilibrium supposition is sufficient, and not necessary, for the research hypotheses of this study to be consistent with predictions of the B&D model of guilt.

4 Experimental Design and Procedure

I test the three research hypotheses of this paper (H1-H3) using the following two experimental treatments:

(1) UP Treatment Subjects played $\Gamma_{UP}$ one time as either Player A or Player B, where the payoffs from $\Gamma_{UP}$ corresponded 1:1 with the monetary payoffs in the experiment.
(2) **PP Treatment** Subjects played $\Gamma_{PP}$ one time as either Player A or Player B, where the payoffs from $\Gamma_{PP}$ corresponded 1:1 with the monetary payoffs in the experiment.

Having subjects play the game once ensures that the experimental results are not affected by any aggregate repeated game affects that can arise even with random re-matching. I acknowledge that a possible drawback of the one-shot design is that subjects may not reach an adequate understanding of the game. Specifically, subjects may not understand how guilt can be induced in $\Gamma_{PP}$. Although $\Gamma_{PP}$ is slightly more complex than previously studied trust games, the incorporation of private information and the opportunity to convey private information are necessary for guilt induction, as posited by BSH (1994). Additionally, attempting to induce guilt upon Player B simplifies down to the binary decision of Player A to *Convey* or *Not Convey* the value of $X$. Thus, from the perspective of Player A, attempting to induce guilt only requires Player A to understand that revealing a low value of $X$ conveys to Player B how much he will suffer if Player B chooses *Left*, which parallels the insights of BSH (1994).

The data was collected from experimental sessions that were conducted in the Economic Science Laboratory (ESL) at the University of Arizona in April 2011. All sessions were computerized and the software was programmed using Z-tree. The subject pool consisted of undergraduates who were recruited via an online database. A total of 14 sessions were conducted using a total of 312 subjects comprising 156 groups. Of the 156 groups, 111 were assigned to the PP treatment and the remaining 45 were assigned to the UP treatment. Each session lasted approximately 25 minutes and subjects earned an average of $9.54 USD (including a $5 show-up payment).

Subject were randomly assigned to their player role (either Player A or Player B), and then randomly and anonymously matched with a subject of the opposite player role. A copy of the experimental instruction are presented in the Appendix. Upon the completion of the game, the decisions of each player, the corresponding outcome, the profit to each player, and the value of $X$ were displayed to both players. All subjects were informed prior to play that the value of $X$ would be revealed to both players upon completion of the task, irrespective of the decisions made in the task. Revealing the value of $X$ to all players ensures that Player As were not motivated to choose *In* (or *Conveying* $X$) just so Player A (Player B) could learn the value of $X$. This design feature eliminates any curiosity biases that may arise from the uncertainty regarding the value of $X$, and the consequent payoffs to other player.

After the subjects finished the game, they were asked to fill out a short questionnaire. In both treatments, the questionnaire contained 8 general demographic questions. In the PP treatment, two additional questions were asked to both Player A and Player B, which related to guilt feelings in the game. The specific questions

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21I thank Urs Fischbacher (Fischbacher (2007)) for providing this software for research purposes.
that were asked to each Player, the corresponding responses, and a discussion of the possible insights that can be gleaned are presented in the results section.

5 Results

5.1 Experimental Data and Hypothesis Testing

H1 stated that a larger proportion of Player As will Convey $X = 0$ compared to $Convey X = 6$ in $\Gamma_{PP}$. To test this hypothesis, I consider Player As in the PP Treatment who chose In and compare the conveyance decisions after $X = 0$ was revealed with the conveyance decision after $X = 6$ was revealed. Table 1 – Panel A presents the aggregate Player A data from the PP Treatment. From Table 1 we can see that of the 111 Player As, 58/111 (52%) chose In. Of those 58 Player As, 16 had $X = 0$ revealed and 26 had $X = 6$ revealed. In terms of the conveyance decision, 7/16 (44%) Player As chose to Convey $X = 0$ and 11/26 (42%) Player As chose to $Convey X = 6$. The proportion of Player As who Convey $X = 0$ is not significantly larger than the proportion who Convey $X = 6$ using a 1-sided Fisher’s exact test ($p = 0.589$) or Pearson’s Chi-Squared test ($p = 0.927$). The conveyance data suggests that Player As are not attempting to strategically induce guilt upon Player Bs.

Although the data suggests that Player As are not attempting to induce guilt upon Players Bs, the data still allows me test H2, albeit counterfactually. We can think of H2 as testing whether strategic guilt induction by Player A would have been effective at motivating Player B to choose Right. To test H2, I compare the proportion of Player Bs choosing Right after $X = 0$ was conveyed compared to the proportion of Player Bs choosing Right after the value of $X$ was not conveyed in the PP Treatment. Table 1 – Panel B presents the aggregate Player B data from the PP Treatment. From Table 1, we can see that 3/7 (43%) of Player Bs chose Right after $X = 0$ was conveyed and 5/40 (13%) chose Right after the value of $X$ was not conveyed. The proportion of Player Bs choosing Right after $X = 0$ was conveyed is significantly higher than after the value of $X$ was not conveyed using a 1-sided Fisher’s Exact test ($p = 0.084$) and a Pearson’s Chi-Squared test ($p = 0.049$). Although the sample size is rather small (as a result of Player As not attempting to induce guilt by choosing to Convey $X = 0$), the data suggests that guilt induction by Player A would have been effective at motivating Player B to choose Right, i.e., Player Bs appear to be susceptible to strategic guilt induction.
### Table 1: Aggregate Results from PP and UP Treatment

**Panel A – Player A Data for PP Treatment (111 Subjects)**

<table>
<thead>
<tr>
<th>In Rate</th>
<th>Convey $X = 0$</th>
<th>Convey $X = 6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>58/111</td>
<td>7/16</td>
<td>11/26</td>
</tr>
<tr>
<td>(52%)</td>
<td>(44%)</td>
<td>(42%)</td>
</tr>
</tbody>
</table>

**Panel B – Player B Data for PP Treatment (58 Subjects)**

| Right $|X = 0$ | Right $|X$ Not Conveyed | Right $|X = 6$ |
|--------|---------|-----------------|---------|
| 3/7    | 5/40    | 0/11            |
| (43%)  | (13%)   | (00%)           |

**Panel C – UP Treatment (45 Pairs of Subjects)**

<table>
<thead>
<tr>
<th>In Rate</th>
<th>Right Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/45</td>
<td>2/17</td>
</tr>
<tr>
<td>(38%)</td>
<td>(12%)</td>
</tr>
</tbody>
</table>

An alternative interpretation of the experimental support of H2 is that Player Bs are motivated by guilt aversion. As I have shown, Player Bs who chooses *Left* will experience more guilt after $X = 0$ is conveyed compared to when the value of $X$ is not conveyed. Thus, the significantly higher proportion of Player Bs choosing *Right* after $X = 0$ was conveyed in the PP treatment can be viewed as experimental evidence consistent with Player B being motivated by guilt aversion. As a result, $\Gamma_{PP}$ provides a method of testing for guilt aversion without having to elicit beliefs. Whereas the previous experimental studies investigating guilt aversion implement designs requiring some form of belief elicitation c.f. Charness and Dufwenberg (Forthcoming) who are able to test for guilt-from-blame without belief elicitation.\(^{22}\) The ability to test for guilt aversion without eliciting beliefs is particularly relevant in light of the recent

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\(^{22}\)Specifically, Dufwenberg and Gneezy (2000), Charness and Dufwenberg (2006), Bacharach, Guerra, and Zizzo (2007), and Dufwenberg, Gächter, and Hennig-Schmidt (2008) elicited second order beliefs and test for a positive correlation between elicited second order expectations and actions. However, because these studies provide only a correlation between elicited second order beliefs and actions, anchoring and false consensus effects cannot be ruled out as possible explanations. Alternatively, Reuben, Sapienza, and Zingales (2009) and Ellingsen, Johannesson, Tjotta, and Torsvik (2010) elicit first-order expectations of subjects, convey those expectations to the subject’s partner,
studies by Reuben, Sapienza, and Zingales (2009) and Ellingsen, Johannesson, Tjotta, and Torsvik (2010). Both of these studies test for guilt aversion using a similar experimental design to one another that features belief elicitation, yet reach opposing conclusions regarding the presence of guilt aversion.\textsuperscript{23}

H3 stated that if having an opportunity to induce guilt fosters more trusting behavior, then more Player As would choose In when playing $\Gamma_{PP}$ compared to $\Gamma_{UP}$. To test this hypothesis, I compare the aggregate Player A In rate in the PP Treatment with the UP Treatment. From Table 1, we can see that 58/111 (52%) of Player As chose In in the PP Treatment and 17/45 (38%) of Player As chose In in the UP treatment. The In rate of Player As in the PP Treatment is significantly higher using a 1-sided Fisher’s Exact test ($p = 0.071$) and Pearson’s Chi-Squared test ($p = 0.100$). The data suggests that strategic settings that provide an opportunity for agents to induce guilt may foster more trusting behavior by those agents.

Although the motivation of this study was to test H1, H2, and H3, I conclude this section with a few speculative remarks regarding possible explanations of data inconsistent with H1. Specifically, I provide several possible explanations why Player A might be motivated to Not Convey $X = 0$ and Convey $X = 6$ in $\Gamma_{PP}$. First, Player As who are averse to being deceptive may be motivated to convey the value of $X$ if given the opportunity, regardless of the value. Second, some Player As are inequity averse and prefer the (6,6) outcome to the (10,4) outcome.\textsuperscript{24} If Player A prefers (6,6) to (10,4), then Player A would be motivated to Convey $X = 6$ in an attempt to motivate Player B to choose Left. Third, some Player As are guilt averse. Because Player B would suffer more guilt from choosing Left when $X = 0$, some Player As might feel guilty over inducing guilt upon Player B by choosing to Convey $X = 0$. BSH (1994) refer to this type of guilty feeling as “metaguilt”. In order to avoid such “metaguilt”, some Player As may have been motivated to Not Convey $X = 0$ and Convey $X = 6$. These are three plausible explanations regarding why some Player As were motivated not to induce guilt upon Player B, contrary to H1.

### 5.2 Questionnaire Results

In this section I present results from the post decision questionnaire. Specifically, I present the data from two questions, related to perceptions of guilty feelings, that and test for correlations between expectations and actions. However, the possibility of untruthful reporting of beliefs and skepticism of conveyed beliefs arise with this approach, as noted by Reuben, Sapienza, and Zingales.

\textsuperscript{23}The results from Reuben, Sapienza, and Zingales (2009) generally support the guilt aversion hypothesis, while Ellingsen, Johannesson, Tjotta, and Torsvik (2010) find little experimental support for guilt aversion.

\textsuperscript{24}According to the Fehr and Schmidt (1999) model, Player A would prefer a payoff vector of (6,6) over (10,4) if $6 \geq 10 - \beta(10 - 4)$. Therefore, a Player A who is averse enough to inequity, ($\beta \geq 2/3$), would prefers the (6,6) to (10,4).
were asked to subjects in the PP Treatment. For the analysis of the questionnaire data, I compare the responses of the two questions using matched samples based on the player role and the players' decisions. This controls for scaling differences that could exist when comparing questionnaire data with an unmatched sample. The questionnaire was not incentivized and did not impact monetary earnings, therefore, the response data should be viewed with caution. Although the questionnaire was not incentivized, interesting insights can still gleaned from the questionnaire data regarding the players feelings and perceptions of feelings regarding guilt in $\Gamma_{PP}$.

Table 3: Average Player A’s Reported Player B Guilt

| Panel A – Player As who chose Out (49 Subjects) |  |
| $X = 0$ Known | $X = 0$ Unknown | $X = 6$ Known | $X = 6$ Unknown |
| 2.90*** | 2.03 | 1.60 | 2.05* |

| Panel B – Player As who chose In (52 Subjects) |  |
| $X = 0$ Known | $X = 0$ Unknown | $X = 6$ Known | $X = 6$ Unknown |
| 2.27** | 1.64 | 1.50 | 2.50*** |

Notes: The reported amounts of guilt were tested using a 1-sided Wilcoxon Signed-Rank test for a matched sample.
* denotes significance at the 10% level  ** denotes significance at the 5% level  *** denotes significance at the 1% level

The two questions relating to perceptions of guilt were specific to the player role and the decisions made in the game. For Player As, the first question asked how much guilt they thought Player B felt (would have felt) from choosing Left if Player B knew (would have known) the true value of $X$. The second question asked Player As how much guilt they thought Player B felt (would have felt) from choosing Left if Player did not know (would not have known) the true value of $X$. Because each questions corresponded to the actual decision(s) made by Player A in the game and actual value of $X$, at least one of the answers was a counterfactual estimate. Responses were ranked on a 5-point scale with 5 being a Very High amount and 1 being a Very Low amount. The data for these two questions is intended to provide information regarding Player A’s perceptions of Player B’s guilty feelings at the possible conveyance states. Table 3 presents the aggregate response data from the two questions for Player As.25

25Because the questionnaire was voluntary, subjects were not required to submit an answer for each question. A total of 10 of 111 Player As did not answer at least one of the questions related to
The Player A response data in Table 3 is divided into 2 panels corresponding to the In/Out decision made by Player A. Each of the panels is then further divided based on the value of X. From Panel A, we see that Player As who chose Out perceived that Player B would have felt more guilt from choosing Left if $X = 0$ was conveyed compared to if $X = 0$ was not conveyed ($p = 0.001$), and more guilt if $X = 6$ was not conveyed compared to if $X = 6$ was conveyed ($p = 0.082$). Similarly, from Panel B, we see that Player As who chose In perceived that Player B would have felt more guilt from choosing Left if $X = 0$ was conveyed compared to if $X = 0$ was not conveyed ($p = 0.017$), and more guilt if $X = 6$ was not conveyed compared to if $X = 6$ was conveyed ($p = 0.0002$).

The questionnaire response data reveals that Player As, regardless of their In/Out decision, perceived that Player Bs would suffer more guilt from choosing Left if $X = 0$ was conveyed compared to if the value of $X$ was not conveyed, and more guilt from choosing Left if the value of $X$ was not conveyed compared to if $X = 6$ was conveyed. This provides some evidence that Player As recognized that guilt could be induced in Player B by conveying $X = 0$ and not conveying $X = 6$, despite the fact that Player As did not attempt to do so.

For Player B, the first question asked Player B to rate the amount of guilt he/she felt (would have felt) from choosing Left (if he had chosen Left) if he/she did not know the value of $X$. The second question asked Player B to rate the amount of guilt he/she felt (would have felt) from choosing Left (if he had chosen Left) if he/she knew the value of $X$. Again, responses were ranked on a 5-point scale with 5 being a Very High amount and 1 being a Very Low amount. Similarly for Player B, depending on the decision(s) of Player A and Nature, at least one of the answers was a counterfactual estimate. The data from these questions is intended to provide information regarding Player B’s guilty feelings at the different conveyance states. Table 4 presents the aggregate response data from the two questions for Player Bs.

The Player B response data in Table 4 is divided into 2 panels that correspond to whether Player B actually made a decision, i.e., whether Player A chose In. From Panel A we see that Player Bs who did not make a decision responded that they would have felt more guilt from choosing Left if $X = 0$ was conveyed compared to if $X$ was not conveyed ($p = 0.0001$), and more guilt from choosing Left if $X$ was not conveyed compared to if $X = 6$ was conveyed ($p = 0.0001$). Similarly, the Player Bs who made a decision responded that they did (would have) felt more guilt from choosing Left if $X = 0$ was conveyed compared to if $X$ was not conveyed ($p = 0.003$), and more guilt from choosing Left if $X$ was not conveyed compared to if $X = 6$ was conveyed.

\footnote{The belief of Player Bs’ guilt feelings. Therefore, the aggregate data in Table 3 reflects the responses of 101 Player As who did answer both questions.}

\footnote{A total of 6 of 111 Player Bs did not answer at least one of the questions related to their guilt feelings. Therefore, the aggregate data in Table 4 reflects the responses of 105 Player Bs who did answer both questions.}
conveyed (p = 0.004).

Table 4: Average Player B’s Reported Guilt

<table>
<thead>
<tr>
<th>Panel A – Player Bs who did not make a decision (52 Subjects)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 0 Known  X = 0 Unknown</td>
<td></td>
</tr>
<tr>
<td>2.32***</td>
<td>1.55</td>
</tr>
<tr>
<td>X = 6 Known  X = 6 Unknown</td>
<td></td>
</tr>
<tr>
<td>1.57</td>
<td>2.29***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B – Player Bs who made a decision (53 Subjects)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 0 Known  X = 0 Unknown</td>
<td></td>
</tr>
<tr>
<td>2.22***</td>
<td>1.61</td>
</tr>
<tr>
<td>X = 6 Known  X = 6 Unknown</td>
<td></td>
</tr>
<tr>
<td>1.60</td>
<td>2.20***</td>
</tr>
</tbody>
</table>

Notes: The reported amounts of guilt were tested using a 1-sided Wilcoxon Signed-Rank test for a matched sample.
* denotes significance at the 10% level  ** denotes significance at the 5% level  *** denotes significance at the 1% level

The questionnaire response data from Player Bs reveals that Player Bs, irrespective of whether or not they made a decision, were susceptible to guilt induction by Player A. That is, Player Bs felt (would have felt) more guilt from choosing Left after Player A conveyed X = 0 compared to if Player A did not convey X. Similarly, Player Bs felt (would have felt) more guilt from choosing Left after Player A did not convey X compared to if Player A conveyed X = 6. The response data of Player Bs is consistent with observed Player B behavior.

6 Conclusion

Several recent studies have highlighted the importance of guilt aversion as a plausible behavioral motivation of economic agents. However, previous studies related to guilt aversion have not considered the richer set of interpersonal strategic implications that can arise when agents are guilt averse. The motivation of this study is to experimental investigate such interpersonal strategic implications from guilt aversion. To do so, I consider a design centered around an experimental trust game – \( \Gamma_{PP} \) which features a strategic structure rich enough to allow agents an opportunity to induce guilt in a manner consistent with psychological insights of BSH (1994). I additionally show that the BSH (1994) method for inducing guilt is consistent with the B&D model of simple guilt and can be supported as an equilibrium of \( \Gamma_{PP} \).
The experimental results do not support H1. Namely, there is little experimental evidence that first movers (Player As) attempt to induce guilt upon second movers (Player Bs). However, the data from the post decision questionnaire suggests that, although Player As do not attempt to induce guilt, they recognize that guilt could have been induced upon Player B. The experimental results do support H2. Namely, Player Bs appear to be susceptible to strategic guilt induction. Alternatively, guilt induction by Player A would have been an effective mechanism for influencing Player B to choose a kind action. This is also reinforced by the questionnaire responses by Player B. Specifically, Player Bs reported that they would feel more guilt from choosing the unkind action the more that action hurt Player A. The experimental results support H3. Namely, Player As exhibit more trusting behavior when the strategic setting features and opportunity to induce guilt upon Player B.

In addition to providing experimental evidence that agents are susceptible to being guilt induced in strategic settings, the results provide evidence consistent with the hypothesis that agents are motivated by guilt aversion. \( \Gamma_{PP} \) allowed me to identifying behavior that is consistent with guilt aversion without having to elicit beliefs. Therefore, the experimental design provided an alternative approach for investigating guilt aversion from those previously implemented, which does not require belief elicitation or conveying elicited beliefs; both of these present previously established limitations and somewhat inconclusive results regarding the presence of guilt aversion in games (Reuben, Sapienza, and Zingales (2009) c.f. Ellingsen, Johannesson, Tjotta, and Torsvik (2010)). This paper joins Charness and Dufwenberg (forthcoming), in its ability to test models of belief dependent utility without having to elicit beliefs.

There is a growing body of literature that investigates the importance of trust in social and economic settings, and how trust can be fostered (see Charness, Du, Yang (2011) for a review). Partnerships, principle-agent contracting, and employee-employer relationships, represent some of the many economic settings where trust is pivotal for successful and efficient relations. While these economic settings often provide an incentive to trust, this incentive is often offset by the vulnerability and exposure of the trusting agent to possible opportunistic behavior by the trusted agent. However, guilt induction by the trusting agent can serve as a mechanism for thwarting opportunistic behavior by the trusted agent, thus mitigating the vulnerability associated with trusting actions. Having an opportunity to induce guilt can then lead to more trusting behavior. While most of the previous literature focuses on reputation building as the primary mechanism for fostering trust, this study shows that having an opportunity to induce guilt can foster trust, even in a one-shot setting.\(^{27}\) This

\(^{27}\)That is, building a trustworthy reputation through prior trustworthy actions, that are observable to other agents, induces agents to trust you in the future. Many experimental studies have found evidence consistent with this “indirect reciprocity” including Bohnet and Huck (2004), Bolton, Katok, and Ockenfels (2005), Greiner and Levati (2005), Seinen and Schram (2006), Duffy, Lee, and Xie (2008), and Engelmann and Fischbacher (2009). Charness, Du, and Yang (2010) provide a thorough review of these papers as well as provide experimental evidence that a reputation of
might help explain why trust is so prevalent in society today, where guilt induction is often possible.

BSH(1994) note that “guilt may operate as an interpersonal influence technique that allows even a relatively powerless person to get his or her way” (pp. 247). The authors similarly note that "guilt does not depend on formal power or influence and may even work best in the absence of such power, because one induces guilt by depicting oneself as the helpless victim of another’s actions" (pp 247). This suggests that guilt induction could be particularly effective in economies with less developed legal systems. In such economies guilt induction could serve as an informal mechanism for enforcing contracts and mitigating corrupt behavior, that might otherwise transpire in the absence of formal prohibitive legislation (Lee (2010)). Guilt induction could prove to be effective at influencing behavior and impacting outcomes in credence goods markets (see Dulleck and Kerschbamer (2006), Dulleck, Kerschbamer, and Sutter (2009), and Beck, Kerschbamer, Qiu, and Sutter (2010)). In these credence goods markets, e.g. doctors and mechanics, the consumer is often the “helpless victim” of the experts actions. Guilt induction by the consumer could be implemented to thwart opportunistic behavior by the expert, especially in developing economies where the incentives for opportunistic behavior are likely to be much stronger.

Before I conclude, I speculate about two possible areas of future research that might prove valuable for better understanding the interpersonal implications of guilt aversion in strategic settings. The first involves investigating guilt induction in the absence of credible payoff conveyance between agents. The experimental game in this study only permits credible payoff conveyance between agents. However, in many economic setting with private payoff information, credible payoff conveyance may be costly or impossible, e.g., firms involved in relationship specific investment or partnerships. It remains to be investigated whether agents attempt to induce guilt, and whether induced guilt remains an effective behavior mechanism when credible payoff revelation is not possible.\(^\text{28}\) The second involves investigating guilt induction and its effectiveness in repeated games. Specifically, ex post guilt induction upon an agent who chose an unkind action in a previous period could thwart unkind actions by that agent in future periods.\(^\text{29}\) Many economic settings involve repeated interaction between agents and in these settings, guilt induction could be used to foster long lasting, trusting relationships.

I conclude by noting that the effectiveness of guilt induction as an influence mechanism in strategic settings may have limitations. In particular, repeated applications

\(^{27}\)The credible conveyance aspect of the design played a critical role in the application of the B&D model of guilt aversion. Applying their model, deriving Player B’s guilt, and showing that guilt induction can be supported as an equilibrium in a trust game with a “cheap talk” conveyance stage may prove to be non-trivial.

\(^{28}\)In this type of setting, an agent would actually be inducing guilt, and not counterfactual guilt like I have considered in this study.
of guilt induction may become less effective since the target of the guilt induction will likely become resentful or angered over its repeated application. This could ultimately lead to less kind responses to guilt induction, which is counter to its intended purpose. BSH (1995) recognize this and argue that “although guilt may often be an effective way of getting one’s way, it appears to be costly and to carry some stigma. This suggests that inducing guilt may be a technique that has to be used with caution and restraint” (p. 183). Perhaps guilt induction in strategic settings should be a mechanism that is reserved for instances when the risk from trusting in the highest.
References


7 Appendix

Sample Instructions – PP Treatment

Welcome and thank you for participating. Your participation is VOLUNTARY, and you may leave at any time. Feel free to raise your hand and ask questions at any time, and you may refer back to these instructions at any time during the session. Please remain seated and quiet for the remainder of the session. All decisions are to be completed individually and interaction with other participants is strictly PROHIBITED. Thank you for your cooperation.

Each person will receive a $5 show-up payment for participating. In addition, you can receive additional compensation based on the decision(s) that are made in the decision task described below. After the task is complete, you will be privately paid the amount of money you have earned. Upon completions of the decision task, please remain quietly seated in your carrel until you have been paid.

The Decision Task:

You will be participating in a 2-person decision task. Each person will be randomly and anonymously paired with another person in the lab. In each of the 2-person decision-making pairs, one person will be randomly assigned the role of PLAYER A and the other person will be randomly assigned the role of PLAYER B. You will remain in your assigned role for the entire session. The earnings of each Player will depend on the decision(s) he/she makes, and/or the decision(s) of the Player with whom they are paired. A brief outline of steps of the decision task will first be provided, followed by a detailed description of each step and the corresponding earnings for each Player.

- Step 1: PLAYER A begins by first choosing IN or OUT.
  - If PLAYER A chooses OUT, then the task ends.
  - If PLAYER A chooses IN, then the task proceeds to Step 2.

- Step 2: PLAYER A might privately learn some payoff information that was initially unknown to both players. If PLAYER A does learn the information, the PLAYER A will then have an opportunity to convey the information to PLAYER B. The task will then proceed to Step 3.

- Step 3: PLAYER B chooses between RIGHT or LEFT, and the task ends.
Step 1: PLAYER A first chooses between IN or OUT.

- If PLAYER A chooses OUT, then the decision task ends. PLAYER A will receive $6 and PLAYER B will receive $2.
- If PLAYER A chooses IN, then the task proceeds to Step (2) where PLAYER A might privately learn the unknown information, and then have an opportunity to convey that information to PLAYER B. After Step (2), the task will proceed to Step (3) where PLAYER B will then be asked to decide between RIGHT or LEFT.

Step 2: I postpone the details about the information that PLAYER A can possible learn, and convey to PLAYER B until after Step (3) is described. Describing Step (3) first will help clarify Step (2).

Step 3: If PLAYER A chooses IN, at Step (1), then PLAYER B must choose between RIGHT or LEFT.

- If PLAYER B chooses RIGHT, then the decision task ends. PLAYER A will receive $10 and PLAYER B will receive $4.
- If PLAYER B chooses LEFT, then the decision task ends and PLAYER A will receive $X and PLAYER B will receive $6. There is a 50% chance that $X = 0$ and a 50% chance that $X = 6$. That is, $X = 0$ and $X = 6$ are equally likely.

NOTE: When the decision task begins, neither PLAYER A nor PLAYER B knows the value of $X$. Therefore, PLAYER A does not know the value of $X$ when he/she decides between IN or OUT in Step (1). Now we proceed with the description of Step (2):

Step 2: If PLAYER A chooses IN, there is an 80% chance that PLAYER A will privately learn the value of $X$, and a 20% chance that PLAYER A will not privately learn the value of $X$.

- If PLAYER A does learn the value of $X$ (80% chance), then PLAYER A must then decide whether or not to convey the value of $X$ to PLAYER B before PLAYER B makes his/her decision in Step (3).
– If PLAYER A does convey the value of X, then PLAYER B will know the value of X before he/she decides between RIGHT or LEFT in Step (3).
– If PLAYER A does not convey the value of X, then PLAYER B will not know the value of X before he/she decides between RIGHT or LEFT in Step (3).

• If PLAYER A does not learn the value of X (20% chance), then PLAYER A will not have an opportunity to convey the value of X to PLAYER B. The task will proceed to step (3) where PLAYER B will then choose between RIGHT or LEFT without knowing the value of X.

**Payoff Table:**
The table below summarizes the earnings of each Player for each of the possible outcomes in the decision task:

<table>
<thead>
<tr>
<th>Decision Outcome</th>
<th>PLAYER A Earnings</th>
<th>PLAYER B Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAYER A chooses OUT</td>
<td>$6</td>
<td>$2</td>
</tr>
<tr>
<td>PLAYER A chooses IN and then:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLAYER B chooses RIGHT</td>
<td>$10</td>
<td>$4</td>
</tr>
<tr>
<td>PLAYER B chooses LEFT</td>
<td>$X</td>
<td>$6</td>
</tr>
</tbody>
</table>

There is a 50% chance \( X = 0 \) and a 50% chance \( X = 6 \)

Each person will participate in this decision making task ONE time. After the task has ended, the decision(s) of each Player and the corresponding earnings of each Player will be revealed to both Players. Additionally, the value of X will be revealed to both PLAYER A and PLAYER B regardless of the decisions made in the task. You will then be asked to fill out a short questionnaire that will take about 3 minutes to complete. Your answers to the questionnaire are confidential and will not be shared with any other participants. After completion of the questionnaire, an Experimenter will then come by and privately pay you your total experimental earning which equals your earnings from the decision task PLUS the $5 show-up payment. After you have been paid, you may quietly exit the lab.