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Jan Osborn
Chapman University, josborn@chapman.edu

Bart J. Wilson
Chapman University, bjwilson@chapman.edu

Bradley R. Sherwood
Chapman University, sherw106@mail.chapman.edu

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Conduct in Narrativized Trust Games

Jan Osborn,* Bart J. Wilson,† and Bradley R. Sherwood‡

We "narrativize" a basic extensive form trust game by placing participants in a story that contextualizes the interaction with an unforeseeable future. In our narrative experiment, participants consider each decision as a character, advancing the story with their choices for salient payoffs. Our interest is in understanding how participants apply Adam Smith's rules of beneficent and just conduct in our narrativized games with epistemic conditions of an unknown future, conditions which aren't possible in extensive form. We invite our readers to participate in the story of the results, making meaning as participants in a narrative that unfolds with their choices.

JEL Classification: B12, C90, D03

Man has developed rules of conduct not because he knows but because he does not know what all the consequences of a particular action will be.

–F.A. Hayek

1. Introduction

An incessant buzz emanates from your pocket, interrupting your otherwise peaceful post-lecture lunch. You put your sandwich down and pull out your phone to see what the big deal is. "Oh yeah," you remember as you read the reminder, "I have one of those experiments today." You head over to the laboratory a little early, recalling that there is an "on-time bonus" for being punctual. After entering the building, you follow the signs to the lobby and take a seat in the sea of strangers all here for the same reason: to get paid in cash for doing an experiment. You scan the room and recognize a face or two, but for the most part, you know no one. The two people next to you seem to know each other, but they are hushed by the lab attendant almost immediately after they begin talking. Rolling their eyes, they switch their attention to their phones. You sit in silence for another minute or two before you see a line start to form in front of the attendant. You join the line, get your ID card scanned, and follow another monitor into the laboratory.

Shuffling into a room lined with computers in cubicles, you are directed to a computer terminal and get settled. "Wonder what this experiment is," you ponder, recalling the last time you participated. "Some sort of auction last time. It took me awhile to catch on but I made like twenty bucks." You begin to scan the instructions, reading about how you and another person will make joint decisions in a game tree that will determine your final payouts. It is only a few clicks through the simple instructions before you are told you are the first mover (while the other participant waits) and the experiment begins.

* Department of English, Chapman University, Orange, CA 92866, USA; E-mail: josborn@chapman.edu; corresponding author.
† Economic Science Institute, Chapman University, Orange, CA 92866, USA; E-mail: bartwilson@gmail.com.
‡ Chapman University, Orange, CA 92866, USA; E-mail: sherw106@mail.chapman.edu.
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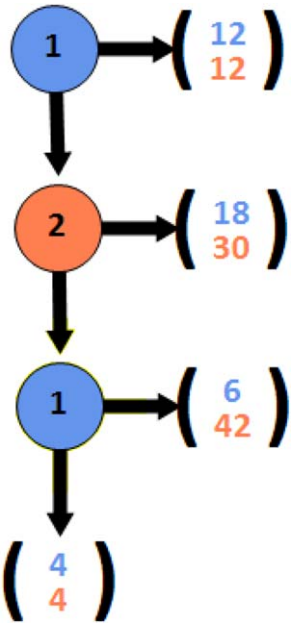

Figure 1. Game Tree. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

A diagram appears on your screen, a series of orange and blue circles, flashing arrows, and pairs of payouts in dollars (see Figure 1). "Wait," you think as you work your way through the tree of decisions and consequences on display in front of you. "This is it? So if I first click the down arrow, the other person can click right and give me $18 and himself $30. Not bad. Better than the $12 we each get if I just click right. But will he click down instead, going for the $42? Then I'm choosing between $6 or $4. That would suck. I hope it doesn't come to that. So, will he or won't he? Or is he a she? He's going to see me click down and that I could click down again. But will I click down again? Maybe I should just end it, take my $12, and be done with it. No, he knows why I'd first click down. I see 18 instead of 12 dollars. He got the good seat. I'd take the $30 if I were him. But is he thinking like me?" You take a moment. Click. The experiment ends, you collect your money and leave.

* * *

Many economists will recognize the extensive form game (EFG) above as a variant of a trust game (see Camerer 2003 and Smith 2008 for a summary of trust games). At the initial decision node, the first mover decides whether or not to trust the second mover to play right against her pecuniary interest of playing down, because playing down a second time is not in the monetary interest of the first mover. The primary question for the first mover boils down to whether the second mover is trustworthy. In this version of the trust game, the second mover also questions whether the first mover is spiteful, that is, willing at a personal cost of $2 to punish her for not choosing ($18, $30).

As a first approximation for understanding these human concepts of trust, trustworthiness, and spite, economists begin with the assumption that agents have complete symmetric information over all contingencies, which lends itself to tidy logic and, hence, full explanations. The everyday use of these concepts, however, is not limited to the concrete circumstances of this provisional assumption. We also trust someone not just when we know what the payoffs may be but as a general rule. That is what we mean when we say that we trust someone with our life. Likewise, we say that

someone is trustworthy, not only because he did not take advantage of us on a specific occasion, but because it is in his character to be trustworthy in unforeseeable circumstances, come what may. Often that is why we trusted him in the first place. But how is it that someone personally unknown to us comes to be trustworthy for the very first time? It depends on the circumstances of time and place. It depends on his character. It depends on the story that leads up to the encounter. Or does it?

2. Narrative and Human Conduct

Telling Stories

Even in the world of EFGs, a world where backward induction applies, where all possible payoffs are known, there are stories like those captured in the internal monolog of the opening, an assumption that the other person is also involved in a narrative: *No, he knows why I'd click down first. Does he? So, will he or won't he? Is he thinking like me? Or is he a she?* People try to imagine what story the other participant is telling as they look at the decision tree, but the causal structure is known in advance, with all possible outcomes and payoffs included. This study makes explicit the implied storytelling in an experiment that takes the basic structure of an EFG and narrativizes the decisions in an unfolding story, providing a narrative in which the players participate without recourse to backward induction.

So much of human conduct depends on narrative, on how we situate ourselves within the circumstances, within the story of our lives. Barthes (1975) explores the importance of narrative in the human experience, noting its ubiquity and variety of forms: "present at all times, in all places, in all societies. . .Like life itself, it is there, international, transhistorical, transcultural" (p. 237). Didion (2006) also situates the importance of narrative. "We tell ourselves stories," she writes, "in order to live" (p. 185). But it is Didion's explanation of the meaning-making choices inherent in human storytelling that is pertinent for our purposes (p. 185):

> We interpret what we see, select the most workable of the multiple choices. We live entirely. . .by the imposition of the narrative line upon disparate images, by the "ideas" with we have learned to freeze the shifting phantasmagoria which is our actual experience.

We interpret what we see, this interpretation becoming a narrative; we tell ourselves to make sense of our experiences.

Currie (2007), working with narrative and representation, establishes a causal link between story and our actual experiences, explaining an internal and external dimension to narrative, fictional or nonfictional. A narrative—whether one we tell ourselves or one we interact with as an audience—has both the internal aspect, which establishes the content of the narrative's representation, the characters, their actions, and so forth, and the "causal relatedness. . . of its events" (p. 50), a things-will-work-this-way-in-the-world-of-the-story; and the external aspect, which initiates our "judgements of probability" (p. 50), evoking factors external to the world established in the story. "The causal richness that the narrative form demands," Currie argues, "cannot all be provided explicitly, and must depend on massive imports from the real world" (p. 51). To create or consume stories, we must "import . . . assumptions about causation we make concerning the real world" (Currie, p. 54), factors not made explicit in the narrative. Currie refers to this as "external dependence" (p. 56), our assumptions about the world of the story based on how we believe the world works. In an EFG, these assumptions about causation are payoff, path-dependent assumptions, the story contained in a sterile frame of known results. In naturally occurring contexts, the "payoff" is often not revealed in this way. The narrative is open-ended, calling on much more "massive imports from the real world."

Barthes (1975) refers to the causal element of narrative as a "syntax of human behavior" (p. 252), tracing the "succession of 'choices' which this or that character inevitably has to face at various points in the story, and thus, to bring to light what could be called an energetic logic," a decision to do this or to do that (p. 252). It is the narrative we create that helps us negotiate the succession of choices in our lives. The "ifs," the "maybes"—even in an EFG experiment—involve a story we are telling ourselves. Our study shifts the decisions from a payoff perspective to a narrative perspective to explore Adam Smith's rules of beneficent and just conduct (1759). By narrativizing the decisions, we dispense with the simplifying assumption of complete knowledge on the precise consequences of every action and embed the choices in a more human context, a context of story in which nobody knows what all the consequences of a particular action will be.

Internal Narrative and Adam Smith's Rules of Conduct

In a rather intriguing precursor to Barthes, Didion, and Currie, Adam Smith (*The Theory of Moral Sentiments* 1759) invokes the importance of a form of narrative and a syntax of human conduct. Smith theorizes that moral judgment is based on sympathy, on a human being's ability to share feelings with other human beings. He explains that our imagination is central to this process (p. 9):

> As we have no immediate experience of what other men feel, we can form no idea of the manner in which they are affected, but by conceiving what we ourselves should feel in the like situation. . .By the imagination we place ourselves in his situation. . .

This is a kind of "external dependence" (Currie 2007, p. 56). Our assumptions about the experience of another based on our senses, our own experiences creating the narrative we tell ourselves to sympathize with another. This "imposition of the narrative line" (Didion 2006, p. 185) is central to Smith's theory of moral sentiments. "Fellow-feeling," as he calls it, involves narrativizing the situation at hand. Although not using the word "narrative," Smith is suggesting that our imagination evokes a pleasure or pain felt instantaneously when we imagine the story of the other.

Smith then builds on this idea to explain how we judge the merit or demerit of another's actions, arguing that when we imagine ourselves in the situation we make moral judgments. When the passions of the person involved are "in concord with the sympathetic emotions of the spectator" (Smith 1759, p. 16), we judge the actions as deserving reward. Whereas, when the passions of the person involved are not in concord with what we feel, they deserve punishment. It is the story we are telling ourselves about the situation that elicits the judgment. We impose our own narrative line onto the actions in question by achieving "some correspondence of sentiments between the spectator and the person principally concerned" (p. 21).

Once he has established this connection between the actor and the spectator, Smith connects this sense of merit and demerit to the concepts of reward and punishment. Smith posits that the judgment of merit or demerit depends on both the situation and the consequent action and that, as a result, reward or punishment depends on the beneficial or hurtful effects and the sentiments associated with the action. He argues that the sentiment most directly prompting reward is gratitude and that the sentiment most directly prompting punishment is resentment (Smith 1759, p. 68). Beneficent action, which comes from "proper" motives, results in the sentiment of gratitude, prompting reward; hurtful action, which comes from "improper" motives, results in the sentiment of resentment, prompting punishment. This "syntax of human behavior" (Barthes 1975) in a Smithian framework impacts the narrative, the story we tell ourselves in deciding on beneficence (Smith 1759, p. 95):

> What gratitude chiefly desires, is not only to make the benefactor feel pleasure in his turn, but to make him conscious that he meets with this reward on account of his past conduct, to make him pleased with that conduct, and to satisfy him that the person upon whom he bestowed his good offices, was not unworthy of them. . .We are delighted to find a person who values us as we value ourselves. . .

On the other side of this syntax is resentment, resulting in punishment: "What chiefly enrages us against the man who injures or insults us, is the little account which he seems to make of us, the unreasonable preference which he gives to himself above us" (p. 96). In making these determinations, we are evoking a story, imagining why the other chose to do this or that, basing our interpretation on the narrative we have created. Such narrativizing of our lives is central to any gratitude/reward, resentment/punishment scenario.

Narrative in Games

Dickey (2006) explains the link between narrative and problem solving in games, first connecting narrative to solving problems in general—"It is through narrative constructs that we frame and recount daily experiences in problem solving" (p. 245)—and then specifically exploring the use of narrative in adventure games, concluding, "Game designers are well versed in devices and techniques for constructing compelling and engaging narratives that allow for immersion and agency" (p. 245). Simon (2007) extends the importance of narrative to game theory, arguing that narratives "provide excellent platforms for thought experiments and simulations of 'models of behavior'" (Par 18). When Simon quotes Edward Branigan (2006, *Projecting a Camera: Language Games in Film Theory*), the problem-solving, meaning-making, human circle is complete (as quoted in Par 19):

> One of the purposes of seeing and perceiving narratively is to weigh how certain effects that are desired may be achieved, how desire is linked to possibilities for being, how events may proceed. In this way, perceiving narratively operates to draw the future into desires expressed in the present as well as demonstrates how the present was caused by the past and how the present may have effects in the future.

The importance of "perceiving narratively. . .to draw the future into desires expressed in the present" provides a framework for our narrativizing an EFG, a moving from a path-dependent payoff to a story where the paths unfold as the characters make choices. The story we are telling ourselves impacts conduct.

The environment established by the narrative in adventure games helps players make decisions and is an important element in role-playing games (RPGs) either table top or electronic, such as *Dungeons & Dragons* or *Final Fantasy*. Through a narrative story line, players "identify and construct causal patterns that integrate what is known . . . with that which is conjectural yet plausible within the context of the story" (Dickey 2006, p. 252).

There is also a form of RPGs made popular as a young adult book series: *Choose Your Own Adventure*. R. A. Montgomery, with roots in the design of interactive RPGs in the early 1970s, published an RPG in book form.[1] The genre allows the reader to imagine she is a character in the adventure and to make choices that impact the outcome of the story. The reader's choice, without any idea where it may lead, determines the path of the narrative. If the reader chooses one

[1] "History of Choose Your Own Adventure." <http://www.cyoa.com/pages/history-of-cyoa>. Accessed January 18, 2013.

scenario, she is directed to a specific page; for example, "Turn to page 15." If she chooses a different scenario, she is directed to a different page, the adventure determined by the reader imagining what would happen. This unfolding of the narrative is central to the design of our study.

—But what is the relevance of the above senses of a "game" to the economist's formal definition and use of a "game" in game theory? Are we not conflating the use of the word?—The common family resemblance of all senses of a game is this: People do not merely do a game; we play a game. And to play a game is to engage our imagination, to engage in a narrative governed by rules, whether it be the Green Bay Packers driving the football down the field, a lone teenager rescuing a princess in *King's Quest*, or a Walmart and a Target executive each privately setting their weekly prices for a three-pack of Hanes white t-shirts. Playing a game entails (i) imagining, via a narrative, what the future may hold and (ii) acting in accordance with the rules of the narrative, both formal and informal.

Game theory strips the "narrative" down to outcomes, which are "non-negotiable" (Simon, Par 25), and a causal structure of actions, which are known in advance (in normal or extensive form). Players in this game use strategies based on immediate or anticipated future benefit. In a head-to-head, zero sum interaction, reducing the problem to this "essence" predicts reasonably well, for the actions and consequent payoffs dominate the content of the narrative.[2] But in a positive sum world with the possibilities for trust, the narratives imposed by the mind are too rich to be distilled down to players, actions, and a mapping of actions into payoffs. Our human minds rely on rules of conduct to cope with these fickle circumstances, particularly when the precise consequences of our actions are unknown.

It is at the point between a non-negotiable, backward induction structure and a negotiable, narrative context for decision-making where this study begins. We compare how people conduct themselves in a sterile EFG environment to how they conduct themselves when they are, instead, acting as a participant in a narrative, making decisions as a character in a story. To explore this juncture, we create a narrative context for an extensive form trust game in Smith and Wilson (2013). They design several EFGs, one of which is central to our experiment, to test three of Adam Smith's propositions of moral conduct. Specifically, we construct our narrative to investigate two rules of conduct from the section entitled "Of Justice and Beneficence" in Part II entitled "Of Merit and Demerit" (p. 78):

> **Rule of Beneficent Conduct**: "Actions of a beneficent tendency, which proceed from proper motives, seem alone to require reward; because such alone are the approved objects of gratitude, or excite the sympathetic gratitude of the spectator."
>
> **Rule of Just Conduct**: "Actions of a hurtful tendency, which proceed from improper motives, seem alone to deserve punishment; because such alone are the approved objects of resentment, or excite the sympathetic resentment of the spectator."

With slightly different payoffs, Smith and Wilson (2013) replicate three other experiments on one-shot extensive form trust games (McCabe and Smith 2000, Cox and Deck 2005, and Gillies and Rigdon 2008). Approximately half of the first movers beneficently play down in both versions of the game in Figure 2, and two-thirds of the second movers reward those actions of a beneficent tendency by playing right. Thus, roughly one-third of the pairs achieve the ($18, $30) or ($15, $25)

[2] Vernon Smith (personal communication, 11 August 2013).

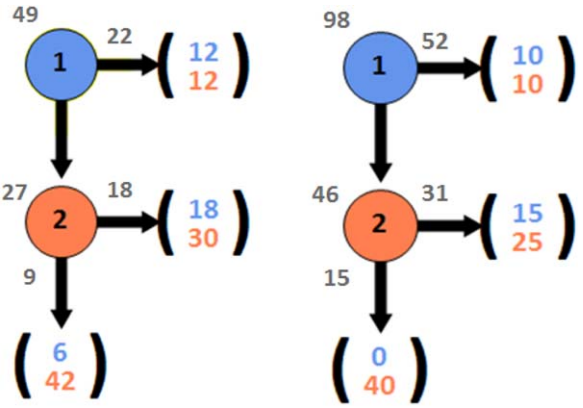

Figure 2. Trust Games with No Punishment. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

outcome as compared to approximately half of the pairs realizing the Pareto-dominated ($12, $12) or ($10, $10) outcome predicted by money maximization and subgame perfection.

To test the *Rule of Just Conduct*, Smith and Wilson add a third decision node to Figure 2 if the second mover plays down. At the third decision node (see Figure 3), the first mover can either play right yielding payoffs of ($6, $42) or play down yielding payoffs of ($4, $4). Only 7 of 25 first movers reach the third node and just 3 of them (42.9%) resent the second movers enough to punish them. We create a narrative for Figures 1 and 3 in which the readers as participants make decisions that further the plot. We then compare how our participants conduct themselves as compared to participants in traditional extensive form trust game experiments.

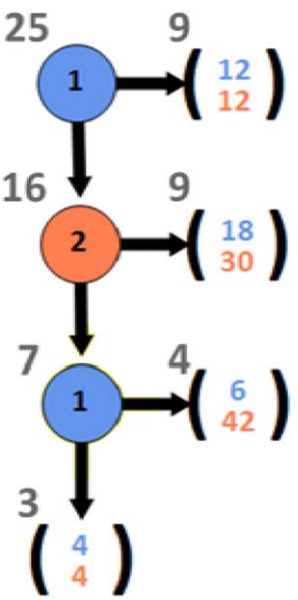

Figure 3. Trust Game with Punishment. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

3. Experimental Design and Procedures

Unlike an EFG in which participants see all potential outcomes and the paths to those outcomes, our narrative reveals only one decision node at a time, thus eliminating the opportunity for backward induction. The participants become characters in the world of a story that unfolds in front of them. When characters make a decision, they do not know that it may end the game or pass the next decision to the other character. All they know is that they are furthering the story as the three short pages of simple instructions inform them:

> Welcome (page 1)
>
> Today you will participate as a character in a story. The story will unfold as two characters make decisions. The decisions made by you and another person seated in this laboratory will determine how much money you will earn. Your earnings will be paid to you privately, in cash, at the end of your story.
>
> The Story (page 2)
>
> You and the other character will jointly determine the plot, resulting in a set of payoffs. When it is time to make a decision, two buttons will appear, each designating an action to take in the story.
>
> At the end of the story, you will be paid at the rate of US$1 per 1,000 story dollars. For example, if you end with $9,000 in the context of the story, you will be paid US$9.
>
> Your story may conclude before or after participants around you. When your story comes to an end, please wait quietly until you are called to the window to be paid.
>
> Ready to Begin (page 3)
>
> If you have any questions, please raise your hand, and a monitor will come by to answer them. If you are finished with the instructions, please click the START button. The instructions will remain on your screen until everyone has clicked the START button. We need everyone to click the START button before the story can begin.

The Design of the Story

In an EFG experiment, two strangers without a personal history interact in what they may or may not contextualize as a personal, social interaction. The first decision in narrativizing the game is choosing the setting for the story. We deliberated between either setting the scene as an interaction between explicit strangers or between two characters personally known to each other. Supposing that characters known to each other might be more likely to reach the ($18, $30) outcome than in EFG experiments, we set the scene with two characters who have a history with each other. Failing to observe more ($18, $30) outcomes in this context would be that much more informative.

We then place these two characters familiar with each other in a plotline that is readily relatable to undergraduate participants and ask the first mover to take one of two actions, one of which ends the story with the ($12, $12) outcome and the other which passes the decision-making to the other character. We do not assign a name to the participant reading the story; he or she is simply referred to as "you." Each participant's counterpart, however, is referred to as "Taylor," a name

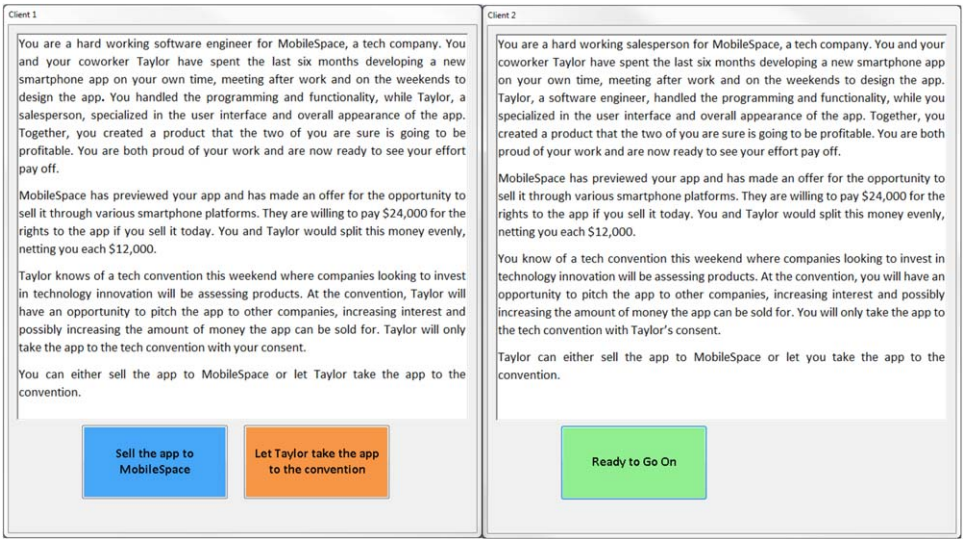

Figure 4. Narrative of First Mover's Decision Node. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

without gender specification. Figure 4 displays the story for the first decision node. The first mover's perspective is on the left and the second mover's on the right.

Unlike in an EFG where it is basically up to the participants whether to travel the tree with a notion of "we're in this together" or "I'm in this for myself," we embed the two characters as coworkers in a collaborative relationship. To further emphasize the collaboration, the two characters jointly develop an app on their own time outside of work. Each character participates equally in the development of the app, and each is responsible for a specific portion of the app. Thus, it is a joint effort that generates the total value of the app. Note that we purposefully state that the value of the app could possibly increase without providing any monetary specifics. In contrast to an EFG, the story only hints at the possibility of a better offer for the app. The characters must discover on the fly the total value of the app. In the EFG, it is public knowledge that the first mover may end up with a lower payoff by not initially ending the game. Thus, without being aware of such a possibility, we hypothesize that a greater proportion of first movers will "let Taylor take the app to the convention" than first movers play down in the extensive form trust game.

Action buttons, which always begin with a verb, express the characters' agency in the context of the story, much like the option to flip between pages in the *Choose Your Own Adventure Series*. For each pair of participants, the computer randomly determines the order in which the options to act are presented to the pair. The first (second) option is always presented as the left (right) button and we block the color of the left button, blue or orange, across all pairs. The character who does not have a decision to make must click on the green "Ready to Go On" button. Only after both participants have clicked a button does the story simultaneously advance for the pair.

We narrativize the two options of the second mover by having another company double the initial offer. The decision for the second mover is how to allocate who receives what portion of the new offer (see Figure 5). The participants can always click back to reread how they arrived at subsequent decision nodes.

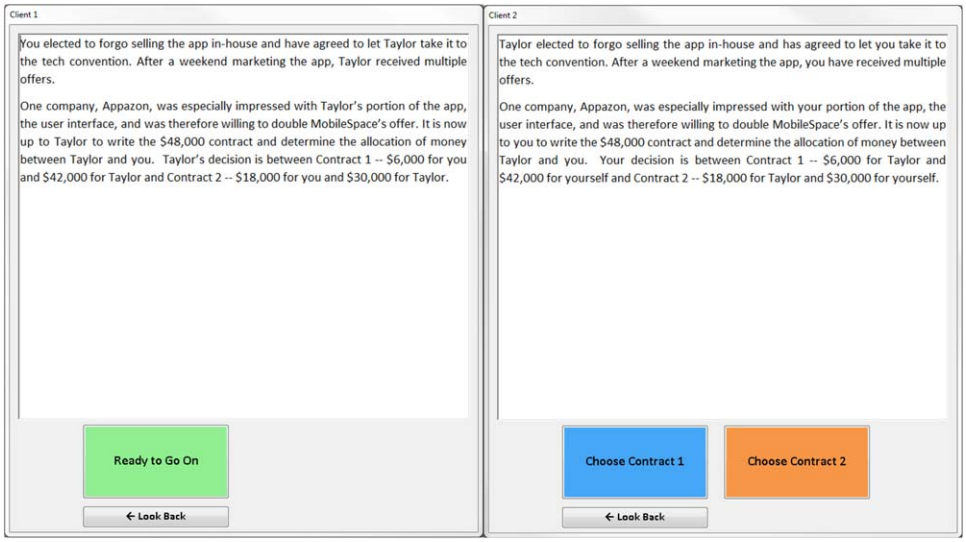

Figure 5. Narrative of Second Mover's Decision Node. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Notice that at this decision node, the paths and payoff outcomes are exactly the same as in the extensive form trust game without punishment (Figure 2). The first mover has foregone ($12, $12) and the second mover is deciding between ($18, $30) and ($6, $42). Smith and Wilson (2013) interpret the ($18, $30) outcome as rewarding the beneficence of the first mover because the second mover's payoff increases from $12 to either $30 or $42. But does the second mover recognize the first mover's act as one of beneficence? In our story, we complicate the recognition of beneficence by explicitly stating that the new offer is due to the second mover's distinct portion of the joint effort. Thus, our narrative, unlike an austere EFG, justifies why the second mover receives more money in the ($18, $30) outcome that rewards beneficence. But does it justify ($6, $42)? At this point in the extensive form trust game without punishment, both participants know that this decision is final. In contrast, in the extensive form trust game with punishment (Figure 3), both know that the first mover will have to sanction ($6, $42) by foregoing ($4, $4) at the next decision node. In the narrative, though, both participants know only that the second mover is choosing between ($18, $30) and ($6, $42) and that the story may or may not end with either decision. Does a rule of beneficent conduct apply for the second mover?

This is a realistic middle ground case that an EFG cannot readily accommodate. Sure, we could create a new unformalizable EFG experiment in which the second mover clicks on the ($6, $42) outcome and then a new decision node for the first mover suddenly appears in its stead. *Oops, you thought you had clicked on* (*$6, $42*) *but, no, now the first mover decides.* But how would we explain how the decision-making in the game tree works without deceiving the participants? Even supposing that we could find such delicate but not contorted statements to explain the story-free exercise, the subjects are going to be asking themselves, why and what (the heck) is going on? There is nothing for the participant to cleave to. In a narrative, we can preempt questions stemming from vertigo, thereby allowing the participants to focus on the decision of interest. The story grounds the participants. It is a basis on which to predicate their thinking. (Recall the inner monolog in the opening narrative.)

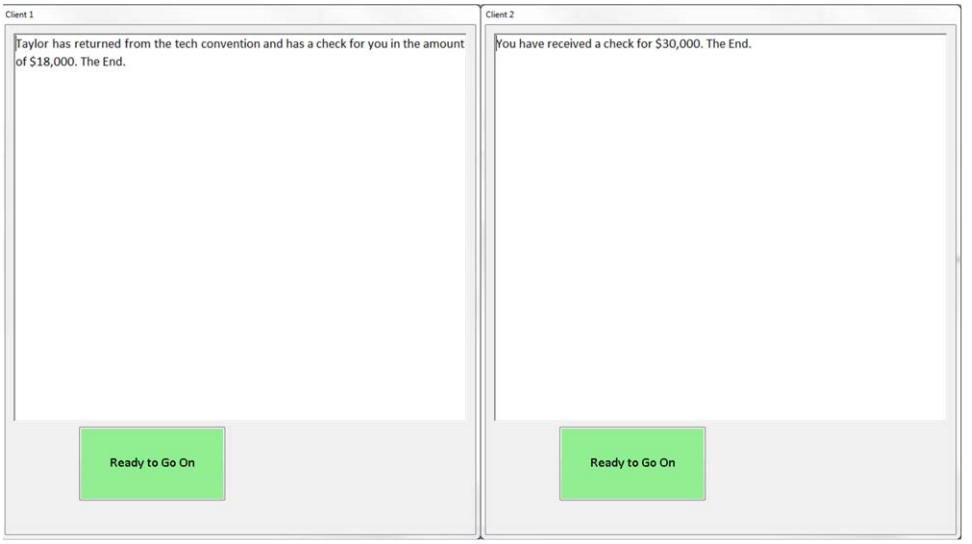

Figure 6. Story Ending for the ($18, $30) Outcome. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

If the second mover chooses ($18, $30), the characters receive a one sentence ending to the story (see Figure 6). Again the order of the two outcomes is randomly presented to the pair and the colors of the button blocked across half of the pairs.

If the second mover chooses ($6, $42), the story continues, and the first mover has another decision to make (see Figure 7). The key principle for the narrative design at this juncture in the story is to present a plausibly unforeseeable opportunity for the first mover to punish the second mover for not choosing ($18, $30). Notice that their employer has come forward in the meantime and is willing to represent the first mover. Taking the second mover to court is a deliberate and

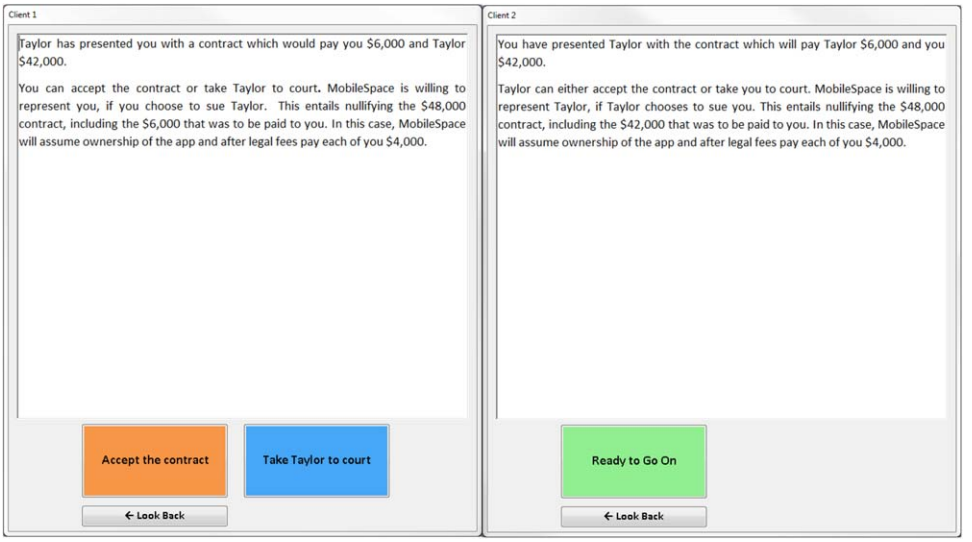

Figure 7. Narrative of First Mover at the Third Decision Node. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

explicitly meaningful action for carrying out resentment. The costs of suing and winning justify to the characters a loss of $40. As with the previous decision nodes, the order of the two actions is randomly presented to the pair and the colors of the button blocked across half of the pairs.

The outcomes of this decision node and the path to it are the same as those in the third and final decision node of the extensive form trust game with punishment. Smith and Wilson (2013) predict, based on Adam Smith's *Rule of Just Conduct*, that because the second mover is harming the first mover (giving a payoff less than $18 or $12) the second mover deserves punishment by the first mover. Smith and Wilson (2013), however, find that only 3 out of 7 first movers (42.9%) choose ($4, $4).

Their ex post facto speculation is that both participants know, even before the first mover plays down, that the second mover can also play down. Thus, when the decision reaches the second mover, she may be daring the first mover to choose ($4, $4). In other words, the second mover is not harming the first mover because the first mover knows from the get-go that the second mover may play down. In our narrative, this is not the case. The first mover does not know that the second mover will be presented with a choice to harm the first mover, and the second mover does not know that the first mover will have the opportunity to punish the second mover after having explicitly chosen ($6, $42). Notice also that in the EFG with punishment, the second mover literally chooses a branch in the tree, but in the narrative the second mover actually chooses a contract paying out ($6, $42). The question is, in the heat of the moment, will a greater proportion of first movers in the narrative resent a perceived harm and punish the second movers by choosing ($4, $4) over ($6, $42) than in the extensive form trust game with punishment? Obviously, there is a key difference that the story may go on and the EFG will not, but that difference is part and parcel of what we are exploring. Does a rule of just conduct apply for the first mover?

If the first mover takes Taylor to court, the first (second) mover reads the following conclusion to the story: "You (Taylor) sued Taylor (you). MobileSpace owns the app and you have received a check in the amount of $4,000. The End." And if the first mover accepts the contract, the story similarly ends this way: "You accepted the contract and have received a check in the amount of $6,000. The End." Correspondingly, the story concludes for the second mover with "Taylor accepted the contract, and you have received a check in the amount of $42,000. The End."

Before presenting our results in the next section, we anticipate hesitancies to engaging our project. Some readers may fear that by choosing a concrete narrative our findings are likely to be specific to this story and, thus, provide little insight, in general, into rules of conduct. This fear of that which appears to be less general is rooted in the fallacy that the particular case is somehow incomplete. The fact is, however, that "abstract rules of conduct determine particular actions *only together* with particular circumstances (Hayek 1973, pp. 105–6, emphasis added). That is how the mind works. In theorizing, we abstract from the totality of facts precisely because we cannot handle all the facts. Thus, the best we can hope to do as social scientists is to trace out the lower-dimensional projections of these super-conscious abstract rules of conduct (Wilson 2008).

Our project also runs counter to the tradition of administering detailed instructions, often accompanied with a quiz, to "ensure" that the participants "understand" the problem before them. As Vernon Smith points out, "this comes dangerously close to just trying to be sure that the [subjects] understand what the theorist-experimenter understands by the game—imposing our own narratives which implicitly assumes that is the right way to think about the games" (personal

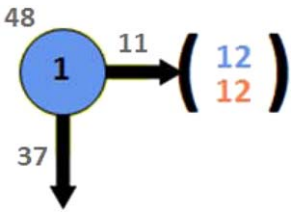

Figure 8. Narrative Results for First Decision. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

communication, 11 August 2013).[3] In contrast, we define the relationship between the participants via an explicit narrative, but make the outcomes open-ended so as to understand the decisions from the perspective of the participants.

Procedures

For a series of four equally sized sessions, we recruited 96 undergraduate participants, 50 male and 46 female, at Chapman University to participate in a one-hour experiment in the spring of 2013. For 16.7% of the participants, this was their first economic experiment, and the median number of experiments of prior experience was 4. Each subject received $7 for showing up on time and was seated in a computer laboratory with 24 visually isolated carrels. The participants read at their own pace the three pages of instructions reported above. All 12 pairs in a session began reading the story at the same time. The participants were privately paid their earnings plus their show-up payment after the last pair concluded their story. From the initial seating to the payment of the last participant, the experiment lasted approximately 30 minutes.

4. Results

We compare the participants' organic decisions growing out of the story with those from traditional EFG experiments in which the participants have nothing to cleave to except the bare structure of the game.[4] Figure 8 reports the results for the first decision in our narrative.

Finding: A smaller proportion of first movers choose (\$12, \$12) in our narrative experiment than they do in an extensive form trust game experiment.

Smith and Wilson (2013) find that their proportion of first movers who play right is statistically insignificant when compared to the three prior trust game experiments with slightly different payoffs (McCabe and Smith 2000; Cox and Deck 2005; Gillies and Rigdon 2008). Forming one metadata set from all four experiments, 74 of 147 first movers (50.3%) end the game in extensive form trust game experiments. We find that only 11 of 48 first movers (22.9%) choose to "Sell the app to MobileSpace," ending the game. Using a one-sided two-proportion z-test, we reject the null

[3] See also Smith (2002).

[4] We are not simply changing two articulable procedures in going from a traditional EFG design to our narrative design. We might be tempted to identify change 1 as "an unforeseeable future" and change 2 as a "the narrative." Because the future, foreseeable or not, and an explicit narrative, present or not, are each of different epistemological kinds, we cannot articulate all the differences internal to the mind of the participants in moving from one to the other. In a deep sense then, we are not simply making two changes. We are making uncountable changes of interest.

hypothesis of equal proportions ($z = 3.3$, p-value $= 0.0004$). As hypothesized, knowing that there is a possibility of greater joint value and without explicitly knowing that they could do worse than \$12, more first movers take the leap and let the second mover take the next action in our experiment. The narrative has established a relationship at this node, the two characters living within a world of shared participation in the development of the app, thus, furthering the trust, even in a situation where potential outcomes are unknown.

On seeing the remaining results of our experiment it is tempting to claim, "'Of course, it had to happen like that.' Whereas we ought to think: it may have happened like that – and also in many other ways" (Wittgenstein 1980, p. 37e). So in what follows we take the rather unconventional approach of using the reader's predictions about what our subjects do to synthesize the conclusions of the experiment. In other words, the readers choose their own adventure through our results, culminating in one of eight possible lessons learned from the experiment.

What do we learn from our experiment by presenting the results this way? If at this moment you cannot predict what you will learn from this experiment because you do not even know what outcomes are possible (why are eight possible?) nor the actions you will have to take to realize them, then the focal question becomes, what story are you telling yourself to pick the next page to turn to? How do you make the decision that you do with an unforeseeable future? How are you thinking about Adam Smith's rules of conduct? Not only will we learn from this experiment how Adam Smith's rules of beneficent and just conduct work or don't work for our participants, we will learn how to invert the very way we think about games in economics; that is, we are learning how Adam Smith would think about games. In this article, we begin with the process of thinking and feeling in narrative to which we then consider which rules of conduct apply. At this point, the reader who dwells on the actual results misses the point of the article and our presentation of it: What are the abstract rules of conduct for the narrative by which the participants in our experiment act with an unforeseeable future, and what are the abstract rules for the narrative by which the reader of economic science thinks about rules of conduct?

If the reader is with us and open to a new way of thinking about games and simultaneously analyzing and synthesizing an experiment, we recommend printing out the article if you haven't already done so. As readers of *Choose Your Own Adventure* books may recall, part of the experience is tactile, and fingering through the text is much easier (and more fun) with a physical copy than a digital one. On reaching the conclusion, we also invite the reader to return to this page and reread with at least one alternative path.

In the EFGs of Figure 2, both participants know the possibilities before the first mover either ends the game or sends the choice to the second mover. In the narrative, however, the characters only know that the options are selling the app in-house and taking (\$12, \$12) or letting the second mover take the app to the tech convention; they do not know that taking (\$12, \$12) will end the experiment, nor do they know what lies ahead should the first mover choose to "forgo selling the app." The second mover does know that when the decision is passed to her, the first mover has no knowledge of a specific higher payoff. She only knows that the first mover knows of a possible higher payoff (see Figure 4). Thus, narrative participants arriving at the second decision node are getting there for different reasons and under different epistemic conditions than EFG participants even though the payoff options for the second mover are identical to those in the EFG.

> If you think that 17 of the 37 second movers (45.9%) choose the (\$18, \$30) contract, go to page 576.
>
> If you think that 27 of the 37 second movers (73.0%) choose the (\$18, \$30) contract, go to page 579.

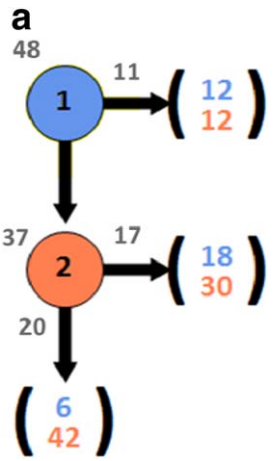

Figure 9. (a) Narrative Results for First Two Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 9a summarizes the number of decisions through the first two nodes. Even though we observe in Finding 1 that a greater proportion of first movers let the second mover take the next action than in an EFG, a smaller proportion of second movers, 45.9%, choose ($18, $30). In EFG experiments (Figure 2), 67.1% of second movers play right (49 out of 73). Using a two-sided two-proportion z-test, we reject the null hypothesis of equal proportions ($z = 2.1$, p-value $= 0.0322$). The net result is that nearly the same proportion of narrative and EFG pairs, 35.4% and 33.3% (49 out of 147), respectively, achieve a Pareto improvement over the first mover simply ending the story unwittingly or the EFG wittingly.

When the second movers in our narrative do not know that there is a possibility of a 50% increase in payoff for the first mover playing down, they conduct themselves differently than when the payoffs are laid out beforehand in the EFG. The first movers do not know what payoffs lie ahead if they decide not to sell right away, and when the second movers know that the first movers do not know what lies ahead, the second movers are less inclined to reward the first movers with the ($18, $30) contract when it becomes a possibility. In an EFG experiment, first movers play down because they see that the second mover can increase her own payoff by 50%, for we do not presume that the first mover wishes to lower her payoff by 50%. When the decision is passed to the second mover in the narrative, however, the second movers know the first movers did not know what might come of it and 21.2 percentage points fewer of them (67.1%–45.9%) feel no need to reward the first movers with the ($18, $30) contract. They take the ($6, $42) contract instead. For 54.1% of the second movers, the *Rule of Beneficent Conduct* does not appear to apply. This is, of course, complicated by the story line that another company is particularly impressed with the second mover's contribution to the app design and is, therefore, willing to double the offer. In accepting Contract 1, "$6,000 for Taylor and $42,000 for you" the *Rule of Beneficent Conduct* is broken, for now the first mover has less than the initial $12,000. How do the corresponding 20 first movers respond to the ($6, $42) contract? Is offering the ($6, $42) contract an action of a hurtful tendency?

If you think that 10 of the 20 first movers (50%) choose to sue resulting in the ($4, $4) outcome, go to page 577.

If you think that 4 of the 20 first movers (20%) choose to sue resulting in the ($4, $4) outcome, go to page 578.

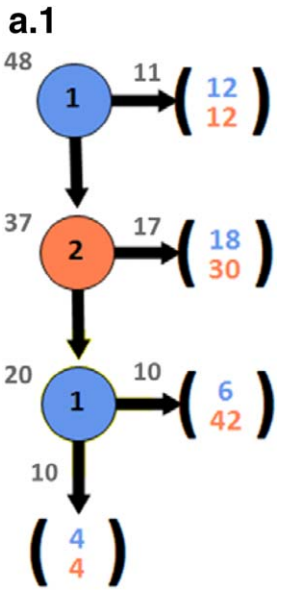

Figure 10. (a.1) Narrative Results for All Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

The complete results for the game are displayed in Figure 10a.1. The sample of seven pairs in Smith and Wilson (2013) at the third node of the EFG with punishment is too small to statistically compare sample proportions, but one would hardly be meaningful considering that we observe that 42.9% (3 of 7) of EFG first movers and 50% (10 of 20) of narrative first movers choose ($4, $4). First movers at the last decision node know that the second movers did not know that punishing via suing the second mover would be an option on receiving the contract for ($6, $42), and yet the contract for ($6, $42) does not excite resentment for a greater percentage of first movers. Hence, we find that first movers do not apply the *Rule of Just Conduct* any more than first movers in the EFG.

The major impact of the narrative is that a greater proportion of first movers let the second mover act and a smaller proportion of second movers apply the *Rule of Beneficent Conduct*. In other words, our narrative, relative to an EFG with the same payoffs, nontrivially affects the conduct of our participants in two of three decision nodes when the precise consequences of their actions are unknowable in advance.

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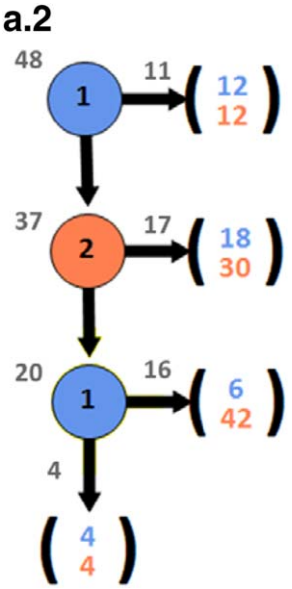

Figure 10. (a.2) Narrative Results for All Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

The complete results for the game are displayed in Figure 10a.2. The sample of seven pairs in Smith and Wilson (2013) at the third node of the EFG with punishment is too small to statistically compare sample proportions. Smith and Wilson (2013) find that 57% (4 of 7) of EFG first movers choose ($6, $42), and we find that 80% (16 of 20) of narrative first movers choose ($6, $42). The 95% confidence interval (asymptotic) for the proportion of first movers who do not sue is (0.6247, 0.9753).[5] First movers at the last decision node know that the second movers did not know that punishing via suing the second mover would be an option on receiving the contract for ($6, $42), and when the story presents the first movers with the option to punish, overwhelmingly they do not. If anything, we find that an even smaller proportion of first movers apply the *Rule of Just Conduct* in the narrative game than in the EFG. The proportion of pairs that end the story/game at ($6, $42) doubles from 16% (4 out of 25) in the EFG to 33.3% (16 out of 48) in our narrative.

The major impact of the narrative is that a greater proportion of first movers let the second mover act, a smaller proportion of second movers apply the *Rule of Beneficent Conduct*, and a large proportion of pairs realize ($6, $42). In other words, our narrative, relative to an EFG with the same payoffs, nontrivially affects the conduct of our participants when the precise consequences of their actions are unknowable in advance.

> Go to page 582 and either keep one finger on this page or remember that you have arrived there via **page 578**.

[5] For the next 13 pairs in an EFG experiment (for a total of 20) that would reach the third decision node, how many first movers will play right? For an over/under bet at 8.5, we'll take the under (9 + 4 = 13 and 13/20 = .65 > .6247).

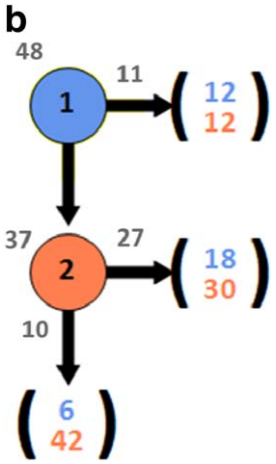

Figure 9. (b) Narrative Results for First Two Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 9b summarizes the number of decisions through the first two nodes. While we observe in Finding 1 that a greater proportion of first movers let the second mover take the next action than in an EFG, a comparable proportion of second movers, 73.0%, choose ($18, $30). In EFG experiments (Figure 2), 67.1% of second movers play right (49 out of 73). Using a two-sided two-proportion z-test, we fail to reject the null hypothesis of equal proportions ($z = 0.6$, p-value = 0.5283). The net result of more second movers applying the *Rule of Beneficent Conduct* is that a greater proportion of narrative pairs, 56.3% versus 33.3% (49 out of 147) in EFG pairs, achieve a Pareto improvement over the first mover simply ending the story unwittingly or the EFG wittingly.

When the second movers in our narrative do not know that there is a possibility of a 50% increase in the payoff for the first mover playing down, they conduct themselves just as they do when the payoffs are laid out beforehand in the EFG. The first movers do not know what payoffs lie ahead if they decide not to sell right away, and when the second movers know that the first movers do not know what lies ahead, the second movers still reward the first movers with the ($18, $30) contract when it becomes a possibility. In an EFG experiment, first movers play down because they see that the second mover can increase her own payoff by 50% and the second mover's payoff by 250%, for we do not presume that the first mover plays down to lower her payoff by 50%. When the decision is passed to the second mover in the narrative, however, the second movers know the first movers did not know what might come of it and yet 73.0% of them reward the first movers with the ($18, $30) contract. They do not take the ($6, $42) contract. The *Rule of Beneficent Conduct* appears to apply for all but 27.0% of the second movers despite the complication in the story line that another company is particularly impressed with the second mover's contribution to the app design and is, therefore, willing to double the offer. How do the corresponding 10 first movers respond to ($6, $42) contract? Is offering the ($6, $42) contract an action of a hurtful tendency?

If you think that 5 of the 10 first movers (50%) choose to sue resulting in the ($4, $4) outcome, go to page 580.

If you think that 2 of the 10 first movers (20%) choose to sue resulting in the ($4, $4) outcome, go to page 581.

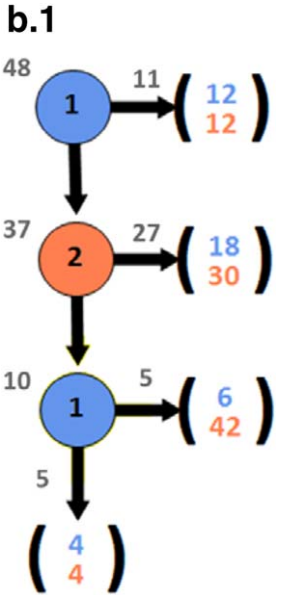

Figure 10. (b.1) Narrative Results for All Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

The complete results for the game are displayed in Figure 10b.1. The sample of seven pairs in Smith and Wilson (2013) at the third node of the EFG with punishment is too small to statistically compare sample proportions, but the comparison would hardly be meaningful considering that we observe that 42.9% (3 of 7) of EFG first movers and 50% (5 of 10) of narrative first movers choose ($4, $4). First movers at the last decision node know that the second movers did not know that punishing/suing the second mover would be an option on receiving the contract for ($6, $42), yet the contract for ($6, $42) does not excite resentment for a greater percentage of first movers. Hence, we find that first movers do not apply the *Rule of Just Conduct* any more than first movers in the EFG.

The major impact of the narrative is that a greater proportion of first movers let the second mover act, a greater proportion of pairs achieve ($18, $30) as second movers apply the *Rule of Beneficent Conduct* at the same rate, and the same proportion of first movers apply the *Rule of Just Conduct*. In other words, apart from vagueness of the prospect of letting the second mover make the next decision, the conduct of our participants is largely unaffected by our narrative, relative to an EFG with the same payoffs.

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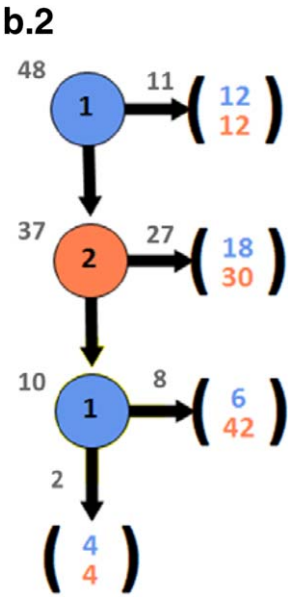

Figure 10. (b.2) Narrative Results for All Decisions. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

The complete results for the game are displayed in Figure 10b.2. The sample of seven pairs in Smith and Wilson (2013) at the third node of the EFG with punishment is too small to statistically compare sample proportions. Smith and Wilson (2013) find that 57% (4 of 7) of EFG first movers choose ($6, $42), and we find that 80% (8 of 10) of narrative first movers choose ($6, $42). First movers at the last decision node know that the second movers did not know that punishing/suing the second mover would be an option on receiving the contract for ($6, $42), and when the story presents the first movers with the option to punish, rather surprisingly the first movers do not. If anything, we find that an even smaller proportion of first movers apply the *Rule of Just Conduct* in the narrative game than in the EFG. The proportion of total pairs that end the story/game at ($4, $4) drops from 12% (3 out of 25) in the EFG to a mere 4.2% (2 out of 48) in our narrative.

The major impact of the narrative is that a greater proportion of first movers let the second mover act, a greater proportion of pairs achieve ($18, $30) when second movers apply the *Rule of Beneficent Conduct* at the same rate, and a minute proportion of pairs realize the poor outcome ($4, $4). In other words, our narrative, relative to an EFG with the same payoffs, nontrivially affects the conduct of our participants when the precise consequences of their actions are unknowable in advance.

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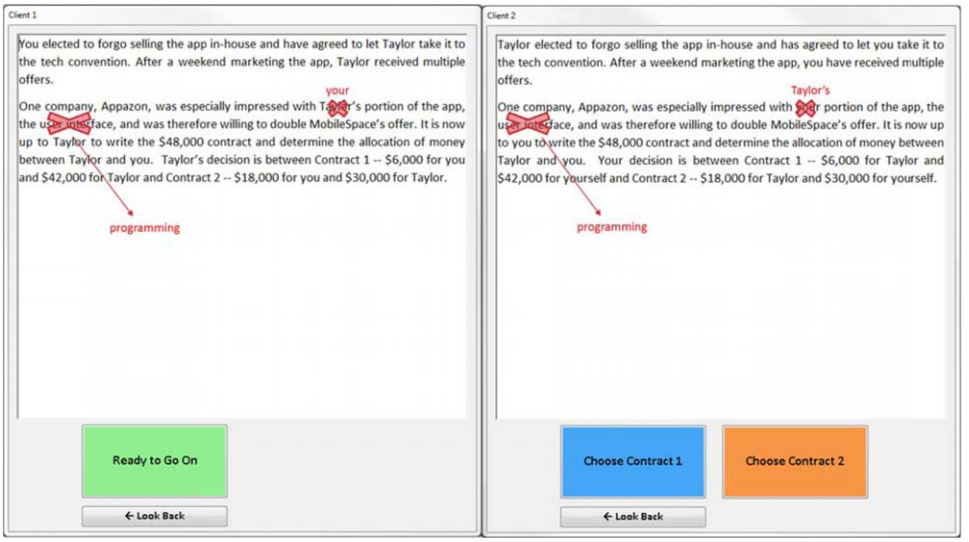

Figure 11. Illustration of the Change in Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

5. A Second Narrative Experiment

To simultaneously test the robustness of our results and whether a slight modification to our narrative alters the conduct of our participants, holding everything else constant, we replace just three words with two new ones at the second decision node only. Using the same story for the first decision node, we can assess the robustness of the decisions on the first page with another set of participants. Figure 11 illustrates the small change to the story. Our aim is, ceteris paribus, to differently draw the future into the desires expressed at the second decision node by crediting the first mover's efforts to the app as the reason for the doubled offer. We hypothesize that a greater proportion of second movers will choose the contract for ($18, $30), applying the *Rule of Beneficent Conduct*.

This treatment is central to the thesis of this article and should not be mistaken for a framing effect that economists often summarily dismiss. A framing effect is a pattern of judgment whereby people differently respond to different hypothetical situations that are logically equivalent.[6] Our change in the narrative is not a framing effect because the two narratives are not logically equivalent. The payoffs are identical and the possible actions are identical, but the newly discovered present as caused by the immediate past is decidedly not. The open research question is whether the *Rule of Beneficent Conduct* at the second decision node differently draws the future into the expression of the present actions.

Procedures

Two months after the first experiment we recruited another 96 undergraduate participants, 46 male and 50 female, for four equally sized sessions. None had previously participated in the first

[6] See, e.g., Tversky and Kahneman (1981).

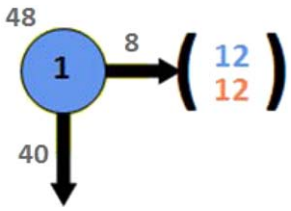

Figure 12. Results for First Decision Node in Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

narrative experiment. Similar to the first experiment, this was the first economic experiment for 17.7% of the participants. The median number of experiments of prior experience was 6. All other procedures were identical to the first experiment.

Results

In what follows, we compare the decisions across our two narratives. As a baseline, Figure 12 reports the results for the first decision node in our second narrative. We fail to reject the null hypothesis of equal proportions ($z = 0.8$, p-value $= 0.4424$) for our two narratives.

Finding: Statistically the same proportion of first movers choose ($12, $12) in our second narrative experiment as they do in the first.

If you came from page 577, go to page 584.

If you came from page 578, go to page 585.

If you came from page 580, go to page 586.

If you came from page 581, go to page 587.

If you think that 28 of the 40 second movers (70.0%) choose the ($18, $30) contract in Narrative 2, go to page 588.

If you think that 36 of the 40 second movers (90.0%) choose the ($18, $30) contract in Narrative 2, go to page 592.

If you think that 28 of the 40 second movers (70.0%) choose the ($18, $30) contract in Narrative 2, go to page 589.

If you think that 36 of the 40 second movers (90.0%) choose the ($18, $30) contract in Narrative 2, go to page 593.

If you think that 28 of the 40 second movers (70.0%) choose the ($18, $30) contract in Narrative 2, go to page 590.

If you think that 36 of the 40 second movers (90.0%) choose the ($18, $30) contract in Narrative 2, go to page 594.

If you think that 28 of the 40 second movers (70.0%) choose the ($18, $30) contract in Narrative 2, go to page 591.

If you think that 36 of the 40 second movers (90.0%) choose the ($18, $30) contract in Narrative 2, go to page 595.

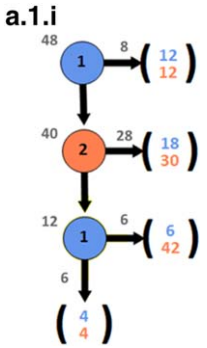

Figure 13. (a.1.i) Results for Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 13a.1.i reports the results for all three decision nodes in our second experiment. The small change in words has a large impact on the proportion of second movers who choose the ($18, $30) contract. In Narrative 1, only 45.9% of the second movers reward the beneficence of the first mover. *In Narrative 2, 70.0% of the second movers, that is, 24.1 percentage points more, reward the first movers' action of beneficent tendency.* We reject the null hypothesis of equal proportions ($z = 2.1$, p-value $= 0.0162$, one-tailed test). It clearly matters whose effort is responsible for doubling of the joint value of the app.[7]

The consummate consequentialist might be tempted to conclude because this version of the story restores the results of the observed proportion of second mover play in extensive form trust game experiments (67.1%) that the motive of the second movers in EFG trust games is to reward the first mover for her contribution to doubling the pie. That leap, which ignores the different epistemic conditions of the narrative and EFG games, cannot account for why 45.9% still choose the ($18, $30) contract in the first narrative. What our narrative experiments expose is the possibility that two individuals in an EFG might disagree on who is "responsible" for the pie doubling (Wilson 2010). Is it the first mover or the second mover? The silence of the tree is deafening.

In Narrative 1, 50% of the first movers at the third decision node do not punish the second movers for choosing the ($6, $42) contract. We find that even though a smaller proportion of the second movers choose the ($6, $42) contract, the same proportion (50%) punishes in Narrative 2.

Unlike the Narrative 1 treatment, Narrative 2 clearly establishes the groundwork for the *Rule of Beneficent Conduct* and the *Rule of Just Conduct* in the world of the story. When the first mover's contribution to the design of the app is that which results in a doubling of MobileSpace's offer, the second mover rewards the first mover's action of a beneficent tendency when she chooses ($18, $30) over ($6, $42). The gratitude toward the first mover results in the second mover choosing the highest payoff presented for the first mover. A hurtful tendency would be evidenced by reducing the first mover's payoff when it is her contribution that resulted in more money. And such an action as an approved object of resentment, Smith (1759) asserts, prompts punishment. The story, in this case, evokes the *Rule of Just Conduct* 50% of the time when first movers punish the second mover's decision to take the contract for ($6, $42).

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[7] It also indicates how closely the participants read the story. How many words were changed?

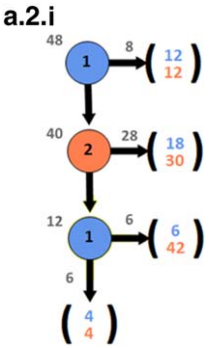

Figure 13. (a.2.i) Results for Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 13a.2.i reports the results for all three decision nodes in our second experiment. The small change in words has a large impact on the proportion of second movers who choose the ($18, $30) contract. In Narrative 1, only 45.9% of the second movers reward the beneficence of the first mover. *In Narrative 2, 70.0% of the second movers, that is, 24.1 percentage points more, reward the first movers' action of beneficent tendency.* We reject the null hypothesis of equal proportions ($z = 2.1$, p-value = 0.0162, one-tailed test). It clearly matters whose effort is responsible for doubling of the joint value of the app.[8]

The consummate consequentialist might be tempted to conclude because this version of the story restores the results of the observed proportion of second mover play in extensive form trust game experiments (67.1%) that the motive of the second movers in EFG trust games is to reward the first mover for her contribution to doubling the pie. That leap, which ignores the different epistemic conditions of the narrative and EFG games, cannot account for why 45.9% still choose the ($18, $30) contract in the first narrative. What our narrative experiments expose is the possibility that two individuals in an EFG might disagree on who is "responsible" for the pie doubling (Wilson 2010). Is it the first mover or the second mover? The silence of the tree is deafening.

In Narrative 1, only 4 out of 20 (20%) first movers at the third decision node punish the second movers for choosing the ($6, $42) contract. We find that when a smaller proportion of the second movers choose the ($6, $42) contract: a greater proportion 6 out of 12 (50%) punish the second mover in Narrative 2.[9] Unlike the Narrative 1 treatment, Narrative 2 clearly establishes the groundwork for the *Rule of Beneficent Conduct* and the *Rule of Just Conduct* in the world of the story. When the first mover's contribution to the design of the app is that which results in a doubling of MobileSpace's offer, the second mover rewards the first mover's action of a beneficent tendency when she chooses ($18, $30) over ($6, $42). The gratitude toward the first mover results in the second mover choosing the highest payoff presented for the first mover. A hurtful tendency would be evidenced by reducing the first mover's payoff when it is her contribution that resulted in more money. And such an action as an approved object of resentment, Smith (1759) asserts, prompts punishment. The story, in this case, evokes the *Rule of Just Conduct* 50% of the time when first movers punish the second mover's decision to take the contract for ($6, $42).

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[8] It also indicates how closely the participants read the story. How many words were changed?

[9] At the 90% level of confidence, we reject the null hypothesis of equal proportions ($z = 1.8$, p-value = 0.0763, two-tailed test).

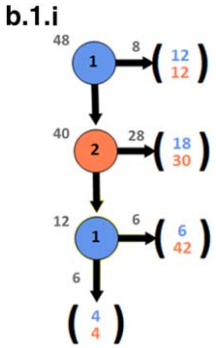

Figure 13. (b.1.i) Results for Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 13b.1.i reports the results for all three decision nodes in our second experiment. The small change in words has virtually no impact on the proportion of second movers who choose the ($18, $30) contract. In Narrative 1, 73.0% of the second movers reward the beneficence of the first mover. In Narrative 2, 70.0% of the second movers reward the first movers' action of beneficent tendency. We fail to reject the null hypothesis of equal proportions ($z = 0.3$, p-value = 0.8893, one-tailed test). It matters rather little whose effort is responsible for doubling the joint value of the app.

In Narrative 1, 50% of the first movers at the third decision node do not punish the second movers for choosing the ($6, $42) contract. We find the same proportion (50%) of first movers punish in Narrative 2. From the perspective of an observer, the expression of the *Rule of Just Conduct* is a consistent coin flip. In sum, apart from the first mover's decision to let the second mover act, there is no evidence of any difference between our narratives, nor between our narratives and the traditional EFG experiment.[10] Does this mean that narratives do not matter in trust games? The answer depends on whether (i) you believe that payoffs are all that matter and that it matters little that the future is unforeseeable or (ii) you simply conclude that this narrative does not matter for this game.

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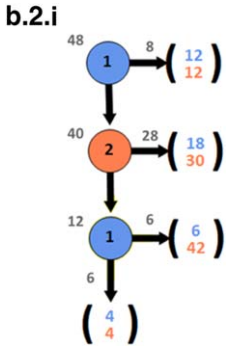
[10] The critic who expected that the change in Narrative 2 wouldn't matter might claim that it indicates how inattentively the participants read the story in both experiments. How many words were changed?



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In Narrative 1, only 2 out of 10 (20%) first movers at the third decision node punish the second movers for choosing the ($6, $42) contract. We find that when the same proportion of the second movers choose the ($6, $42) contract, a greater proportion 6 out of 12 (50%) punish the second mover in Narrative 2. Resentment appears to grow when the first mover's effort is responsible for increasing the joint value of the project, though because so many second movers choose the ($18, $30) contract our sample sizes at the third node are too small to appropriately conduct a z-test of sample proportions. In sum, apart from the first mover's decision to let the second mover act, there is little evidence of any difference between our narratives, nor between our narratives and the traditional EFG experiment.[11] Does this mean that narratives do not matter in trust games? The answer depends on whether (i) you believe that payoffs are all that matter and that it matters little that the future is unforeseeable or (ii) you simply conclude that this narrative does not matter for this game.

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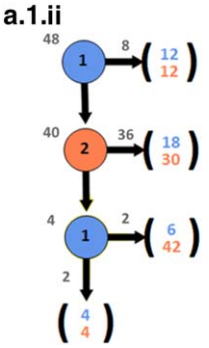

Figure 13. (a.1.ii) Results for Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 13a.1.ii reports the results for all three decision nodes in our second experiment. The small change in words has a tremendously large impact on the proportion of second movers who choose the ($18, $30) contract. In Narrative 1, only 45.9% of the second movers reward the beneficence of the first mover. In Narrative 2, 90.0% of the second movers, that is, 44.1 percentage points more, reward the first movers' action of beneficent tendency. We reject the null hypothesis of equal proportions ($z = 2.1$, p-value = 0.0162, one-tailed test). It matters dramatically whose effort is responsible for doubling of the joint value of the app.[12]

Four previous extensive form trust game experiments each find that 2/3 of second movers reward the beneficence of first movers. In Narrative 2, 90% of second movers apply the *Rule of Beneficent Conduct*.[13] Rare is the result in experimental economics in which 36 of 40 participants make the same decision when such a result is ex ante uncertain. Moreover, 75% (36 out of 48) of all pairs end up at the ($18, $30) outcome. How many pairs in extensive form trust games realize the equivalent of the ($18, $30) outcome? Merely one-third (47 out of 147). Our second narrative generates a conformity of welfare-improving conduct that EFG's do not and starkly suggests, in comparison to the first narrative, that the higher variance of outcomes in EFG experiments stems from a disagreement on who is "responsible" for the pie doubling (Wilson (2010)). Is it the first mover or the second mover? The silence of the tree is deafening.

In Narrative 1, 50% of the first movers at the third decision node do not punish the second movers for choosing the ($6, $42) contract. The flip side of the stark result at the second decision node is a dearth of data at the third node for Narrative 2. We find that even though only 4 second movers choose the ($6, $42) contract, the same proportion (50%) punishes.

The Narrative 2 treatment clearly establishes the groundwork for the *Rule of Beneficent Conduct* in the world of the story. When the first mover's contribution to the design of the app is that which results in a doubling of MobileSpace's offer, the second mover rewards the first mover's action of a beneficent tendency when she chooses ($18, $30) over ($6, $42). The gratitude toward the first mover results in the second mover choosing the highest payoff presented for the first mover. A hurtful tendency would be evidenced by reducing the first mover's payoff when it is her contribution that resulted in more money. And such an action as an approved object of resentment, Smith (1759) asserts, prompts punishment. The story, in this case, evokes the *Rule of Just Conduct* 50% of the time when first movers punish the second mover's decision to take the contract for ($6, $42). Go to page 596.

[12] It also indicates how closely the participants read the story. How many words were changed?
[13] We reject the null hypothesis of equal proportions ($z = 2.7$, p-value = 0.0071, two-tailed test).

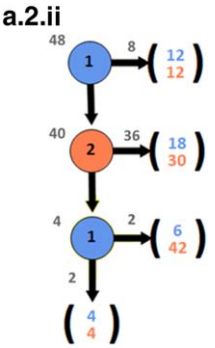

Figure 13. (a.2.ii) Results for Narrative 2. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Figure 13a.2.ii reports the results for all three decision nodes in our second experiment. The small change in words has a tremendous impact on the proportion of second movers who choose the ($18, $30) contract. In Narrative 1, only 45.9% of the second movers reward the beneficence of the first mover. In Narrative 2, 90.0% of the second movers, that is, 44.1 percentage points more, reward the first movers' action of beneficent tendency. We reject the null hypothesis of equal proportions ($z = 2.1$, p-value = 0.0162, one-tailed test). It matters dramatically whose effort is responsible for doubling the joint value of the app.[14]

Four previous extensive form trust game experiments each find that 2/3 of second movers reward the beneficence of first movers. In Narrative 2, 90% of second movers apply the *Rule of Beneficent Conduct*.[15] Rare is the result in experimental economics in which 36 of 40 participants make the same decision when such a result is ex ante uncertain. Moreover, 75% (36 out of 48) of all pairs end up at the ($18, $30) outcome. How many pairs in extensive form trust games realize the equivalent of the ($18, $30) outcome? Merely one-third (47 out of 147). Our second narrative generates a conformity of welfare-improving conduct that EFG's do not and starkly suggests, in comparison to the first narrative, that the higher variance of outcomes in EFG experiments stems from a disagreement on who is "responsible" for the pie doubling (Wilson (2010)). Is it the first mover or the second mover? The silence of the tree is deafening.

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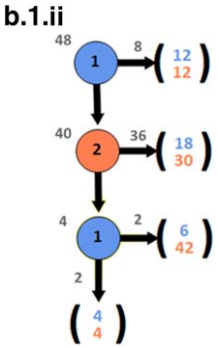
[14] It also indicates how closely the participants read the story. How many words were changed?
[15] We reject the null hypothesis of equal proportions ($z = 2.7$, p-value = 0.0071, two-tailed test).



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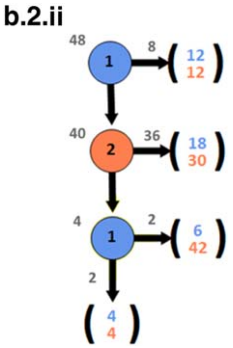
Four previous extensive form trust game experiments each find that 2/3 of second movers reward the beneficence of first movers. In Narrative 2, 90% of second movers apply the *Rule of Beneficent Conduct*.[17] Rare is the result in experimental economics in which 36 of 40 participants make the same decision when such a result is ex ante uncertain. Moreover, 75% (36 out of 48) of all pairs end up at the ($18, $30) outcome. How many pairs in extensive form trust games realize the equivalent of the ($18, $30) outcome? Merely one-third (47 out of 147). Our second narrative generates a conformity of welfare-improving conduct that EFG's do not and starkly suggests, in comparison to the first narrative, that the higher variance of outcomes in two-person EFG experiments stems from a disagreement on who is "responsible" for the pie doubling (Wilson (2010)). Is it the first mover or the second mover? The silence of the tree is deafening.

In Narrative 1, only 5 out of 10 (50%) first movers at the third decision node punish the second movers for choosing the ($6, $42) contract. The flip side of the stark result at the second decision node is a dearth of data at the third node for Narrative 2. We find that only 4 second movers choose the ($6, $42) contract, and 2 of them (50%) punish.

The Narrative 2 treatment clearly establishes the groundwork for the *Rule of Beneficent Conduct* in the world of the story. When the first mover's contribution to the design of the app is that which results in a doubling of MobileSpace's offer, the second mover rewards the first mover's action of a beneficent tendency when she chooses ($18, $30) over ($6, $42). The gratitude toward the first mover results in the second mover choosing the highest payoff presented for the first mover. A hurtful tendency would be evidenced by reducing the first mover's payoff when it is her contribution that resulted in more money. And such an action as an approved object of resentment, Smith (1759) asserts, prompts punishment. The story, in this case, evokes the *Rule of Just Conduct* 50% of the time when first movers punish the second mover's decision to take the contract for ($6, $42). Go to page 596.

[16] It also indicates how closely the participants read the story. How many words were changed?
[17] We reject the null hypothesis of equal proportions ($z = 2.7$, p-value $= 0.0071$, two-tailed test).



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Four previous extensive form trust game experiments each find that 2/3 of second movers reward the beneficence of first movers. In Narrative 2, 90% of second movers apply the *Rule of Beneficent Conduct*.[19] Rare is the result in experimental economics in which 36 of 40 participants make the same decision when such a result is ex ante uncertain. Moreover, 75% (36 out of 48) of all pairs end up at the ($18, $30) outcome. How many pairs in extensive form trust games realize the equivalent of the ($18, $30) outcome? Merely one-third (47 out of 147). Our second narrative generates a conformity of welfare-improving conduct that EFG's do not and starkly suggests, in comparison to the first narrative, that the higher variance of outcomes in two-person EFG experiments stems from a disagreement on who is "responsible" for the pie doubling (Wilson (2010)). Is it the first mover or the second mover? The silence of the tree is deafening.

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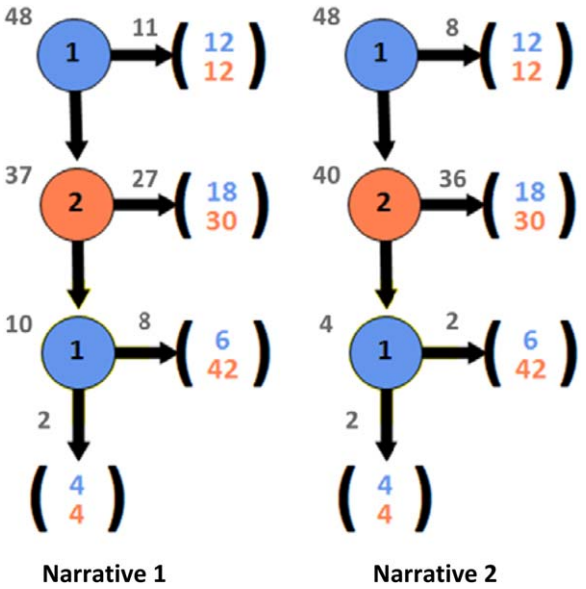

Figure 14. Actual Narrative Results. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

If you are arriving to this page from p. 595, then you have correctly anticipated the actual narrative of the results (via pp. 575, 579, 581–583, 587). Figure 14 summarizes the actual results for the two narrative treatments. The summary implications of our findings for the two treatments are discussed on pp. 581 and 595.

6. Conclusion

Life is indefinite and always in flux. As capable as humans are of kindness by advancing mutual good, they are equally capable of effecting and ready in designing mischief. To contend with the capriciousness of humans, rules of conduct arose in the small band or tribe, by experience and tradition, to regularize and order human interaction (Hayek 1973, 1988). In the face of an unknowable future, we rely on rules of conduct to guide us as the momentaneous present is revealed. Human beings do not simply express behavior; that is, act under specified conditions like amoral molecules in a flask. Rather, we *conduct* ourselves accordingly in relation to the circumstances in which we suddenly find ourselves. If by creating laboratory experiments our goal is to understand human conduct against this hurly-burly background of human action, then including that which is essentially human—the stories we tell ourselves to make meaning of our experience—is as much a part of economics as the science of pecuniary interests that currently pervades the discipline.

Moreover, economic scientists no more set aside their humanness when contemplating the conduct of experimental participants than the participants themselves do when they enter the laboratory. The results do not speak in their own voice to the readers; the readers themselves make meaning of the observations. Their own voices echo through the results. And that is the spirit in which we present our results to the reader. An economic experiment is ultimately about testing what we expect of it, our own way of interpreting the facts, our own assumptions about how we think the narrative of the world works. Thus, each unexpected fact that we encounter is an

opportunity to work on our own way of seeing things. Discovery is irreversible, whether it is by a participant in a laboratory experiment or by a reader of a laboratory experiment. A discovery changes the story; it changes what a person knows. There's no going back. But what doesn't change is the rule of conduct applicable to the particular circumstances of time and place. Strict logical performance in game theory, however, is reversible and thus antithetical for studying moments of discovery and our human conduct therein. Rules of the conduct are our footholds on the shores of unanticipated reality.

Acknowledgments

We thank Jeremiah Ludwinski, Anna Nelson, and Kovid Puria for their research assistance on designing the narrative, Jennifer Maraj for recruiting our experiment participants, Jeffrey Kirchner for his professional software programming, and Cary Deck, Erin Crockett, Laura Razzolini, Vernon Smith, and Sarah Skwire for constructive comments. We gratefully acknowledge financial support from the International Foundation for Research in Experimental Economics and the Summer Undergraduate Research Fellowship Program at Chapman University.

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