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Abstract

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Keywords

cultural beliefs, religion, Immanent justice, morality, fairness

Disciplines

Philosophy | Religion

What goes around comes around:

The evolutionary roots of the belief in immanent justice

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Abstract

The belief in immanent justice is the expectation that the universe is designed to ensure that evil is punished and virtue rewarded. What makes this belief so ‘natural’? Here, we suggest that this intuition of immanent justice derives from our evolved sense of fairness. In cases where a misdeed is followed by a misfortune, our sense of fairness construes the misfortune as a way to compensate for the misdeed. To test this hypothesis, we designed a set of studies in which we show that people who do not believe in immanent justice are nonetheless implicitly influenced by intuitions of immanent justice. Strikingly, this effect disappears when the misfortune is disproportionate compared to the misdeed: In this case, justice is not restored and participants lose the intuition of immanent justice. Following recent theories of religion, we suggest that this intuition contributes to the cultural success of beliefs in immanent justice.

Keywords: Immanent justice; Religion; Fairness; Morality; Cultural beliefs.

*“Tell the righteous that it shall be well with them, for they shall eat the fruits of their deeds.
Woe to the wicked! It shall be ill with him, for what his hands have done shall be done to him”*

Isaiah (3:10-11)

1. Introduction

Deep-rooted in many religious systems is the belief that the universe functions on a principle of inherent, ineluctable justice. Good fortune is a reward that the gods provide for abiding moral rules. Ill fortune is punishment imposed by the gods for violations of the rules (Murdock, 1980; Shweder, Much, Mahapatra, & Park, 1997). Far from being exclusive to traditional societies, these beliefs pervade large-scale modern societies. In the aftermath of September 11th, hundreds of immanent justice theories proliferated and spread the idea that terrorist attacks were a just punishment for America’s moral faults. Despite the fact that most contemporary religious orthodoxies state that misfortunes are punished only in the afterlife, many people are still tempted to explain misfortunes in terms of immanent justice (Callan, Ellard, & Nicol, 2006; Landrine & Klonoff, 1994). What is the origin of such a strong belief? Here, we suggest that this it is a direct consequence of the way our moral sense works.

Evolutionary theorists construe our moral sense as an adaptation to facilitate social life and cooperation (Alexander, 1987; Krebs, 1998; Trivers, 1971). In the ancestral environment, individuals were in competition to be recruited for the most fruitful cooperative ventures, and it was vital to share the benefits of cooperation in a mutually advantageous manner. If an individual took a bigger share of the benefits compared to what she had contributed to produce, her partners would leave her for better collaborators. If she took a smaller share, she would be exploited by her

partners who would receive more than what they had contributed to produce. This context is likely to have led to the selection of a ‘sense of fairness’: a cognitive device aiming to respect individual interests equally.

Being fair amounts to proportioning contributions and retributions and to finding the right balance between individual costs and benefits. This logic of fairness is evident in our everyday moral intuitions. People have the intuition that wages should be proportionate to work and they frown when a professional football player becomes a multimillionaire (Konow, 2003; Marshall, Swift, Routh, & Burgoyne, 1999). This result has received strong support from recent studies showing that when participants work together in a dictator game, the dictator distributes the stake according to each player’s individual contribution (Cappelen, Hole, Sorensen, & Tungodden, 2007; Frohlich, Oppenheimer, & Kurki, 2004; Konow, 2000). This same logic of fairness is at work when it comes to crimes and misdeeds. People want to make up for their misdeeds in order to restore mutually respectful interactions. And when they punish others, they want the punishment to fit the crime. By inflicting a cost proportionate to the cost she inflicted to the victim on the criminal, people try to restore a fair relationship between the wrongdoer and her victim (Carlsmith, Darley, & Robinson, 2002; Sunstein, Schkade, & Kahneman, 2000).

How does this sense of fairness relate to the belief in immanent justice? The sense of fairness takes (positive and negative) contributions and (negative and positive) retributions as inputs and ensures that they are proportionate. This is the ‘proper’ function of this module, the set of problems it was designed to solve. But when misdeeds and misfortunes are processed by the human mind, the sense of fairness treats them as ‘good enough’ inputs and checks whether the misfortune is proportionate to the misdeed. If it is, people have the intuition that the misfortune is a

fair retribution for the misdeed. Misdeeds and misfortunes, in this context, belong to the ‘actual’ domain of the sense of fairness: they satisfy the module’s input conditions although the module was not designed to process them (H. Barrett & Kurzban, 2006; Haidt & Joseph, 2007; Sperber, 1994).

This implies that intuitions of immanent justice are hard-wired, and that even people who do not hold explicit beliefs about immanent justice (or even who explicitly deny them) can’t help but entertain the intuition that when someone does something bad and something bad happens to him, the misfortune is a compensation for the misdeed (Study 1). Similarly, when someone does something overly good and subsequently experiences some good fortune, people construe the latter as a compensation for the initial sacrifice (Study 2). The theory of the actual domain also implies that intuitions of immanent justice should display the signature of the sense of fairness. First, the intuition will disappear if the two events (misdeed/misfortune or good deed/good fortune) are not proportionate. The misfortune can work as a compensation only if it effectively compensates the misdeed. If the misfortune is too harsh compared to the misdeed or, on the contrary, if it is too mild, it will not be construed as a way to restore fairness (Study 3). Second, intuitions of immanent justice will only be triggered if there is a need to restore fairness. If people do more than what is required, the sense of fairness will process good fortune as a compensation for their generosity; if they do less than they should have, the sense of fairness will construe a misfortune as punishment. If, however, they only do what duty requires, no compensation (positive or negative) is needed: they did what they had to do, no more, no less (Study 4).

2. Study 1: Misfortunes are seen as compensations for misdeeds

2.1 Methods

We tested participants' intuition that when someone does something bad and something bad happens to him, the misfortune works as a compensation for the misdeed. Participants read a story describing an action (A) and a subsequent event (E) affecting the character who performed the initial action. Participants were then asked to say whether the action and the subsequent event were causally related. In the immanent justice scenario for instance, participants read the following story: *John is stingy. While walking in the street, a beggar asks him for money. John insults the beggar. While moving away, he steps on his shoelace and falls down.* [break] *John insulted the beggar.* [break] *That's why he fell down.* (see SI Materials and methods for more scenarios) We manipulated causality and justice in four different story types and measured participants' reaction times in response to the description of the final event, which remained rigorously identical across all four conditions (see Figure 1).

[FIGURE 1 ABOUT HERE]

We compared reaction times for correct answers in both non-causal conditions and predicted that justice scenarios would be processed more slowly than neutral scenarios. In justice scenarios, the proportionality between misfortunes and misdeeds meets the input condition of the sense of fairness, and the module construes misfortunes as compensations for misdeeds. However, since the two events are not *causally* related, participants will inhibit their initial moral intuition and answer 'no' to the question 'Is E caused by A?'. This inhibitory mechanism should slow down reaction times in the justice condition compared to the neutral condition.

Participants. We recruited 35 French science undergraduates at the Université Pierre-et-Marie Curie in Paris, among whom explicit belief in immanent justice or supernatural forces was supposed to be uncommon. Four participants were excluded from the analysis because they had responded at chance or because of experimenter error. The remaining 31 participants (21 Males; mean age = 20.5) were included in all further analysis.

Stories. Each participant read 20 stories equally distributed across the four experimental conditions. Four lists were created to control for potential content effects. Each story thus came in four different versions (Causal Justice and Causal Neutral, Non-causal Justice and Non-causal Neutral). Each list was created so that the story appeared in only one of its possible versions. For a given story, the Action and the Event were presented in the same position across all four conditions. All the stories were 4 sentences long and finished with the experimental segment (e.g., That's why he fell down). In order to neutralise any difference which may have impacted on reading times, the last segment was rigorously identical in all four conditions (see Figure 1). Ten filler stories (5 Causal, 5 Non-causal) were also included so as to obscure the goal of the experiment. The stories were presented using E-prime (white 18pt Times New Roman font on a black background).

Procedure. Participants were tested on campus, in a quiet room. The experimenter briefly explained the procedure to the participant and asked her to read detailed instructions on the computer screen. If the participant had no questions, she went on to the training phase (3 trials). The experimental phase started if the participant had no further questions. Each trial started with a screen presenting the story, another screen

showed the first part of the question (A) and, finally, the second part of the question (E) (see Figure 1). The experiment was self-paced: participants pressed the space bar to go from one screen to the next. When the final segment was presented, they had to press 'Yes' or 'No' on the keyboard ('e' and 'p', counterbalanced). The experiment lasted 10 to 15 minutes. At the end of the experiment, participants were debriefed.

Data analysis. Prior to data analysis, a filter excluded items for which either the Story, the first part of the question, or the final part of the question had not been read (the filter was set at 1500 ms, 500 ms and 500 ms, respectively). Trials that were 2 standard deviations away from the mean were considered outliers. Overall, 4.8% of trials were excluded. Statistical analyses were conducted on reaction times for the last segment of the story on trials where correct answers were given. Nonparametric tests were used because the distribution of the data was non-Gaussian. Comparisons between Story Types were made using nonparametric ANOVA (Friedman) as well as Wilcoxon signed-rank tests. All tests were evaluated against two-tailed probabilities. Effect sizes are reported using r as an effect size index (the standard values are $\text{abs}(r)$ 0.1, $\text{abs}(r)$ 0.3 and $\text{abs}(r)$ 0.5 for small, medium, and large sizes, respectively).

2.2 Results and discussion

Most of our participants answered 'no' to questions 'Is E caused by A?' in immanent justice scenarios ($M = 98.0\%$, $SD = 6.0$), and no difference in accuracy rates was found with matched Neutral scenarios ($M = 93.3\%$, $SD = 13.5$), $t(30) = 1.85$, $P = .07$, $r = 0.23$. Accuracy rates were also comparable in the control Causal conditions (Justice $M = 80.3\%$, $SD = 22.6$; Neutral $M = 83.3\%$, $SD = 13.11$), $t(30) = -0.78$, $P = .44$, $d = 0.14$.

This pattern indicates that the participants included in this study did not hold explicit beliefs in immanent justice. Yet a Friedman's ANOVA on reaction times revealed a significant effect of Story Type ($\chi^2 = 22.6$, $df = 3$, $n = 31$, $P < .0001$) (see additional information in Methods). In line with our predictions, participants' responses were slower for Justice (Mdn = 2.82 s) than Neutral scenarios (Mdn = 2.24 s) in the Non-causal condition, $Z = 2.27$, $P = .02$, $r = .41$, Wilcoxon Signed-ranks. In contrast, no difference was found between Justice (Mdn = 3.79 s) and Neutral (Mdn = 3.87 s) scenarios in the Causal condition, $Z = .86$, $P = .39$, $r = .15$, Wilcoxon Signed-ranks. Furthermore, when Causal and Non-causal scenarios were combined, Justice (Mdn = 3.54 s) and Neutral (Mdn = 3.41 s) scenarios were not different, $Z = 1.67$, $P = .10$, $r = .29$, Wilcoxon Signed-ranks (see Figure 2). Finally, establishing a causal link requires checking the whole chain of events, and participants were thus slower for Causal (Mdn = 3.88 s) than for Non-causal (Mdn = 2.46 s) scenarios, $Z = 3.94$, $P < .0001$, $r = .71$, Wilcoxon Signed-ranks (in Non-causal cases, one inconsistency is enough to detect a breakdown in the causal chain). To conclude, the intuitive link between misdeeds and misfortunes in immanent justice scenarios (Non-causal, Justice) interfered with causal attributions and slowed down performance compared to the matched Neutral condition.

[FIGURE 2 ABOUT HERE]

3. Study 2: Good fortunes are seen as compensations for good deeds

3.1 Method

We applied the same logic to good deeds and good fortune. In the immanent justice condition, for instance, participants read the following scenario: "*Mr. Martin works at*

the stock market and owns masterpiece paintings. One day he finds out that his neighbor is ruined and that he has no more money to live. To help him, Mr. Martin decides to give him a very expensive painting. On the following day, Mr. Martin's shares soar and he makes lots of money.[break] *Mr. Martin gave a masterpiece to his neighbor. [break] That's why he's made money.*" (see SI Materials and methods for more scenarios). The recruitment procedure was identical to Experiment 1. 40 science undergraduates were recruited in this experiment. Three were excluded for the same reasons as above. The final sample included 24 Males (mean age = 19.5).

3.2 Results and discussion

Again, participants predominantly answered 'no' to questions about causality in Immanent Justice scenarios ($M = 93.3\%$, $SD = 11.7$) and did so at similar rates to the matched Neutral condition ($M = 89.7\%$, $SD = 16.1$, $t(36) = 1.07$, $P = .29$, $r = 0.18$). Accuracy rates were also comparable in the control Causal conditions (Justice $M = 65.1\%$, $SD = 22.9$; Neutral $M = 69.6\%$, $SD = 21.9$, $t(36) = -0.60$, $P = .55$, $r = 0.10$). Despite this absence of explicit belief in immanent justice, we found a significant effect of Story Type ($\chi^2 = 21.49$, $df = 3$, $n = 37$, $P < .0001$, Friedman's ANOVA). In line with our prediction, reaction times in the non-causal condition indicate that participants were slower when the good fortune could be seen as a compensation for the good deed (Mdn = 2.90 s) than in neutral scenarios (Mdn = 2.60 s, $Z = 2.09$, $P = .04$, $r = .35$, Wilcoxon Signed-ranks). By contrast, no difference was found between Justice (Mdn = 3.65 s) and Neutral (Mdn = 3.48 s) scenarios in the Causal condition ($Z = 0.43$, $P = .67$, $r = .07$, Wilcoxon Signed-ranks). Again, Justice (Mdn = 3.32 s) and Neutral (Mdn = 2.93 s) scenarios were not different overall ($Z = 1.06$, $P = .29$, $r = .17$, Wilcoxon Signed-ranks), and responses were slower in Causal (Mdn = 3.52 s) vs.

Non-causal (Mdn = 2.89 s) scenarios, ($Z = 3.63$, $P < .0005$, $r = .61$, Wilcoxon Signed-ranks).

What these first two experiments demonstrate is that intuitions of immanent justice are pervasive and interfere with people's causal judgments even when they do not explicitly express belief in supernatural forces. But how do we know that these intuitions are truly linked to the sense of fairness? In the previous two experiments, the sense of fairness was activated because the event (misfortune or good fortune) could be construed as a fair compensation for the action (misdeed or good deed). In other words, what activates the sense of fairness is 1) the proportionality of actions and events and 2) the need to compensate actions. This signature can be used to demonstrate that the intuition of immanent justice takes its roots in the very workings of the sense of fairness: If we manipulate the magnitude of the compensation and make it disproportionate to the event, or if we eliminate the need for compensation altogether, the sense of fairness will not be activated and people will lose their intuition of immanent justice.

4. Study 3: The intuition of compensation disappears when misfortunes are unfair

4.1 Methods

In Experiment 3, we used the same scenarios as in Experiment 1, but we changed the severity of the misfortune so that it could not work as a fair compensation for the misdeed (in half the stories, the misfortune was too harsh, in the other half the misfortune was not harsh enough). Returning to the scenario presented in Figure 1, participants would now read the following text in the immanent justice condition (see SI Materials and methods for more scenarios): "*John is stingy. While walking in the*

street, a beggar asks him for money. John insults the beggar. While moving away, he is hit by a car and dies in the accident. [break] John has insulted the beggar. [break] That's why he died." Here, the misfortune is too harsh and cannot be seen as a fair compensation for John's misdeed. The sense of fairness will thus not be activated and participants will not have to inhibit a moral intuition to provide their causal judgment. 39 science undergraduates were recruited in this experiment. The final sample included 24 Males (mean age = 20.2).

4.2 Results and discussion

Participants predominantly answered 'no' to Immanent Justice questions ($M = 96.4\%$, $SD = 11.3$) and did so at similar rates to the matched Neutral condition ($M = 95.9\%$, $SD = 8.2$, $t(38) = 0.20$, $P = .84$, $r = .03$). In the control Causal conditions, Accuracy rates were also comparable (Justice $M = 79.1\%$, $SD = 20.8$; Neutral $M = 74.6\%$, $SD = 23.0$, $t(38) = 0.82$, $P = .42$, $r = 0.13$). As previously, a Friedman's ANOVA on reaction times revealed a significant effect of Story Type ($\chi^2 = 20.51$, $df = 3$, $n = 39$, $P = .0001$). This time, however, participants were not slower for Justice (Mdn = 2.28 s) than Neutral scenarios (Mdn = 2.31 s) in the Non-causal condition, $Z = 0.64$, $P = .52$, $r = .10$, Wilcoxon Signed-ranks. The rest of the pattern remained identical to the first two experiments: No difference was found between Justice (Mdn = 2.85 s) and Neutral (Mdn = 2.94 s) scenarios in the Causal condition, $Z = 0.95$, $P = .34$, $r = .15$, Wilcoxon Signed-ranks. When Causal and Non-causal scenarios were combined, Justice (Mdn = 2.61 s) and Neutral (Mdn = 2.83 s) scenarios were not different, $Z = 0.11$, $P = .91$, $r = .02$, Wilcoxon Signed-ranks. Participants were slower for Causal (Mdn = 2.97 s) vs. Non-causal (Mdn = 2.42) scenarios, $Z = 4.30$, $P < .0001$, $r = .69$, Wilcoxon Signed-ranks. This suggests that when the action and the event are not

proportionate, the input conditions of the sense of fairness are not met and the intuition of immanent justice thus vanishes.

5. Study 4: The intuition of compensation disappears when one only does one's fair share

5.1 Methods

We used the same stories as in Experiment 2 but we changed the generosity of the positive action. In Experiment 2, the characters in the scenario did more than their duty, creating a need for compensation. In Experiment 4, they did only their duty—no more, no less. No compensation was required, and therefore there was no need to restore fairness. Returning to the scenario presented in Experiment 2, participants would now read the following story in the immanent justice condition (see SI Materials and methods for more scenarios): “*Mr. Martin works at the stock market and owns masterpiece paintings. One day his brother goes bankrupt and comes to him to ask him for some money. Being very rich, it is easy for Mr. Martin to lend a bit of money to his brother. On the following day, Mr. Martin's shares soar and he makes money. [break] Mr. Martin has lent money to his brother. [break] That's why he's made money.*” Here, Mr. Martin only does his duty (he's very rich, lending a bit of money is not very costly for him, and the needy person is his brother). The good fortune cannot be construed as a compensation for what he did and the sense of fairness will not be activated. 35 science undergraduates were recruited in this experiment. Two were excluded. The final sample included 15 Males (mean age = 20.7).

5.2 Results and discussion

Just as in all three prior experiments, participants answered ‘no’ to Immanent Justice questions ($M = 87.3\%$, $SD = 16.7$) although they did so slightly less than in the matched Neutral condition ($M = 93.4\%$, $SD = 10.8$, $t(32) = -2.24$, $P = .03$, $r = .37$). Similarly, in the Causal condition, participants performed slightly less well for Justice ($M = 60.9\%$, $SD = 21.5$) than for Neutral scenarios ($M = 69.5\%$, $SD = 21.3$), $t(32) = -2.61$, $P = .01$, $r = .41$). A Friedman’s ANOVA on reaction times revealed no significant effect of Story Type ($\chi^2 = 5.18$, $df = 3$, $n = 33$, $P = .16$). There was also no difference between Justice (Mdn = 3.05 s) and Neutral scenarios (Mdn = 3.06 s) in the Non-causal condition, $Z = 0.41$, $P = .67$, $r = .07$, Wilcoxon Signed-ranks. The rest of the pattern remained identical to the first three experiments: There was no difference between Justice (Mdn = 3.10 s) and Neutral (Mdn = 3.40 s) scenarios in the Causal condition, $Z = 1.06$, $P < .29$, $r = .18$, Wilcoxon Signed-ranks. When Causal and Non-causal scenarios were combined, Justice (Mdn = 3.52 s) and Neutral (Mdn = 3.47 s) scenarios were not different, $Z = 0.74$, $P = .46$, $r = .13$, Wilcoxon Signed-ranks. Participants were slower for Causal (Mdn = 3.36 s) vs. Non-causal (Mdn = 3.09 s) scenarios, $Z = 2.14$, $P = .03$, $r = .37$, Wilcoxon Signed-ranks. This suggests that when one only does one’s duty, a good fortune cannot be seen as a compensation and the intuition of immanent justice therefore disappears.

6. General Discussion

The intuition of immanent justice is usually regarded as irrational. Since Piaget (1932), it has been thought to arise from an inability to attribute causality. Here, we see that it is possible to have the intuition that misfortunes compensate misdeeds

whilst producing correct causal inferences. The intuition of immanent justice is just a normal consequence of the workings of an adapted sense of fairness.

How does this intuition relate to the existence of actual beliefs in immanent justice? It is worth noting that our participants did not think that there was a causal relationship between the misdeed and the misfortune. They only had the intuition that the misfortune and the misdeed were morally linked. Their intuition was moral, not causal. Thus, the phenomenon at stake cannot, in itself, explain the existence of explicit beliefs according to which misdeeds and misfortunes are thought to be *causally* related (through supernatural justice, punishing gods, vengeful ancestors, etc.).

Recent theories of religion (Boyer, 2001; Sperber, 1996) suggest that religious beliefs are indirect consequences of the structure of the human brain. Religious concepts are thought to ‘hack’ mental systems that are also used in non-religious contexts and ‘tweak’ their usual inferences. For instance, beliefs in the existence of supernatural agents catch on very easily because they activate a set of cognitive mechanisms specialized in face detection (Guthrie, 1993), agency detection (J. Barrett, 2000), and strategic interactions (Boyer, 2001). In a similar vein, the way our moral sense works could very well make the human brain receptive to cultural beliefs in immanent justice. In other words, the logic of fairness makes beliefs in supernatural justice or punishing gods easier to grasp and more likely to be accepted. When people hear that a misfortune is caused by a misdeed, they are likely to find this idea convincing because it fits with their intuition that the misfortune compensates the misdeed.

This distinction between *intuitions* and *beliefs* explains why people have only fragmented ideas about immanent justice. The way that supernatural justice is actually

implemented remains a mystery for believers (Boyer, 2001; Thomas, 1997): not much is said about how spirits come to find out about moral faults, how they manage to intervene in human life, or why not all moral faults are punished. What makes belief in immanent justice successful is not its causal plausibility (the actual mechanism by which the spirits do justice) but their moral intuitiveness (how it makes sense of misfortunes and rewards). A fragmentary belief can thus be successful as long as it relies on a moral intuition.

This distinction also explains why the causal aspects of such beliefs are so variable (punishing gods, vengeful ancestors, impersonal fate, etc.) while their moral content is so universal (proportionality between actions and compensations). This is because the sense of fairness vastly underdetermines the causal aspects of cultural beliefs, while strongly constraining their moral contents. In many religious systems, for instance, immanent justice does not take place during people's lifetime. In Hinduism, Sikhism and Buddhism, the belief in karma asserts that positive and negative actions are compiled over the individual's lifetime and are compensated by a good or bad fate in the soul's next life. In this case, misfortunes and good fortunes are explained in terms of past behavior in a previous life.

Since the belief in immanent justice clearly violates common assumptions of naive causal theories (Bloom, 2004; Spelke & Kinzler, 2007; Sperber, Premack, & Premack, 1996), it often needs to be backed by other forces such as trust in authorities, elders, experts, or traditions (Harris & Koenig, 2006; Sperber, 1975; Sperber, et al., 2010). It is also more likely to be transmitted and remembered if it fits with other accepted beliefs in the same culture. People belonging to cultures in which supernatural agents are moral or care about people's actions are more likely to accept the belief in immanent justice than people belonging to cultures in which supernatural

forces are morally neutral or in which there are alternative explanations for misfortunes (voodoo, witchcraft, malicious ancestors, etc.). Among the Vezo of Madagascar for instance, misfortunes are usually seen as the result of a breach of one of the many taboos that people inherit from their ancestors and ought to respect (do not point to whales with your finger, do not sell turtle meat, do not attend funerals) (Astuti, 2007). In this case, there is no need for further explanations in terms of immanent justice, and the belief in immanent justice is hence unlikely to be culturally successful. More generally, when beliefs in immanent justice are not supported by authorities, arguments, or other accepted beliefs, as in the case of our French science undergraduates, people do not hold the actual belief that misdeeds cause misfortunes. Nonetheless, they can't help having the sense that 'what goes around comes around'.

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References

- Alexander, R. (1987). *The biology of moral systems*. Hawthorne, N.Y.: A. de Gruyter.
- Astuti, R. (2007). La moralité des conventions : tabous ancestraux à Madagascar [The morality of conventions: Ancestral taboos in Madagascar]. *Terrain*, 48, 101-112.
- Barrett, H., & Kurzban, R. (2006). Modularity in cognition: Framing the debate. *Psychological Review*, 113(3), 628-647.
- Barrett, J. (2000). Exploring the natural foundations of religion. *Trends in Cognitive Sciences*, 4(1), 29-34.
- Bloom, P. (2004). *Descartes'baby: How the science of child development explains what makes us human*: Basic Books.
- Boyer, P. (2001). *And man creates God: Religion explained*. New York: Basic Books.
- Callan, M., Ellard, J., & Nicol, J. (2006). The belief in a just world and immanent justice reasoning in adults. *Personality and Social Psychology Bulletin*, 32(12), 1646.
- Cappelen, A. W., Hole, A. D., Sorensen, E. O., & Tungodden, B. (2007). The pluralism of fairness ideals: An experimental approach. *American Economic Review*, 97(3), 818-827.
- Carlsmith, K., Darley, J., & Robinson, P. (2002). Why Do We Punish? Deterrence and Just Deserts as Motives for Punishment. *Journal of Personality and Social Psychology*, 83(2), 284-299.

- Frohlich, N., Oppenheimer, J., & Kurki, A. (2004). Modeling other-regarding preferences and an experimental test. *Public Choice*, 119(1), 91-117.
- Guthrie, S. (1993). *Faces in the Clouds: A New Theory of Religion*. New York: Oxford University Press.
- Haidt, J., & Joseph, C. (2007). The moral mind: How 5 sets of innate intuitions guide the development of many culture-specific virtues, and perhaps even modules. *The Innate Mind*, 3.
- Harris, P., & Koenig, M. (2006). Trust in Testimony: How Children Learn About Science and Religion. *Child Development*, 77(3), 505 - 524.
- Konow, J. (2000). Fair Shares: Accountability and Cognitive Dissonance in Allocation Decisions. *The American Economic Review*, 90(4), 1072-1091.
- Konow, J. (2003). Which Is the Fairest One of All? A Positive Analysis of Justice Theories. *Journal of Economic Literature*, XLI (December), 1188-1239.
- Krebs, D. (1998). The evolution of moral behaviors *Handbook of evolutionary psychology: Ideas, issues, and applications* (pp. 337–368).
- Landrine, H., & Klonoff, E. (1994). Cultural diversity in causal attributions for illness: The role of the supernatural. *Journal of Behavioral Medicine*, 17(2), 181-193.
- Marshall, G., Swift, A., Routh, D., & Burgoyne, C. (1999). What Is and What Ought to Be: Popular Beliefs about Distributive Justice in Thirteen Countries. *European Sociological Review*, 15(4), 349-367.

- Murdock, G. P. (1980). *Theories of illness: a world survey*. Pittsburgh: University of Pittsburgh Press.
- Piaget, J. (1932). *Le jugement moral chez l'enfant [The moral judgment of the child]*. Paris: Presses Universitaires de France.
- Shweder, R., Much, N., Mahapatra, M., & Park, L. (1997). Divinity) and the " Big Three" Explanations of Suffering. *Morality and health*, 119.
- Spelke, E. S., & Kinzler, K. D. (2007). Core knowledge. *Developmental Science*, 10(1), 89-96.
- Sperber, D. (1975). *Rethinking symbolism*. Cambridge ; New York: Cambridge University Press.
- Sperber, D. (1994). The modularity of thought and the epidemiology of representations. In S. Gelman & L. Hirschfeld (Eds.), *Mapping the mind: Domain specificity in cognition and culture* (pp. 39-67).
- Sperber, D. (1996). *Explaining culture : a naturalistic approach*. Oxford, UK ; Cambridge, Mass.: Blackwell.
- Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origi, G., et al. (2010). Epistemic vigilance. *Mind & Language*, 25(4), 359-393.
- Sperber, D., Premack, D., & Premack, A. (1996). *Causal cognition: A multidisciplinary debate*: Oxford University Press, USA.
- Sunstein, C., Schkade, D., & Kahneman, D. (2000). Do People Want Optimal Deterrence? *Journal of Legal Studies*, 29(1), 237-253.

Thomas, R. (1997). *Moral development theories--secular and religious: A comparative study*: Greenwood Publishing Group.

Trivers, R. (1971). Evolution of Reciprocal Altruism. *Quarterly Review of Biology*, 46, 35-57.

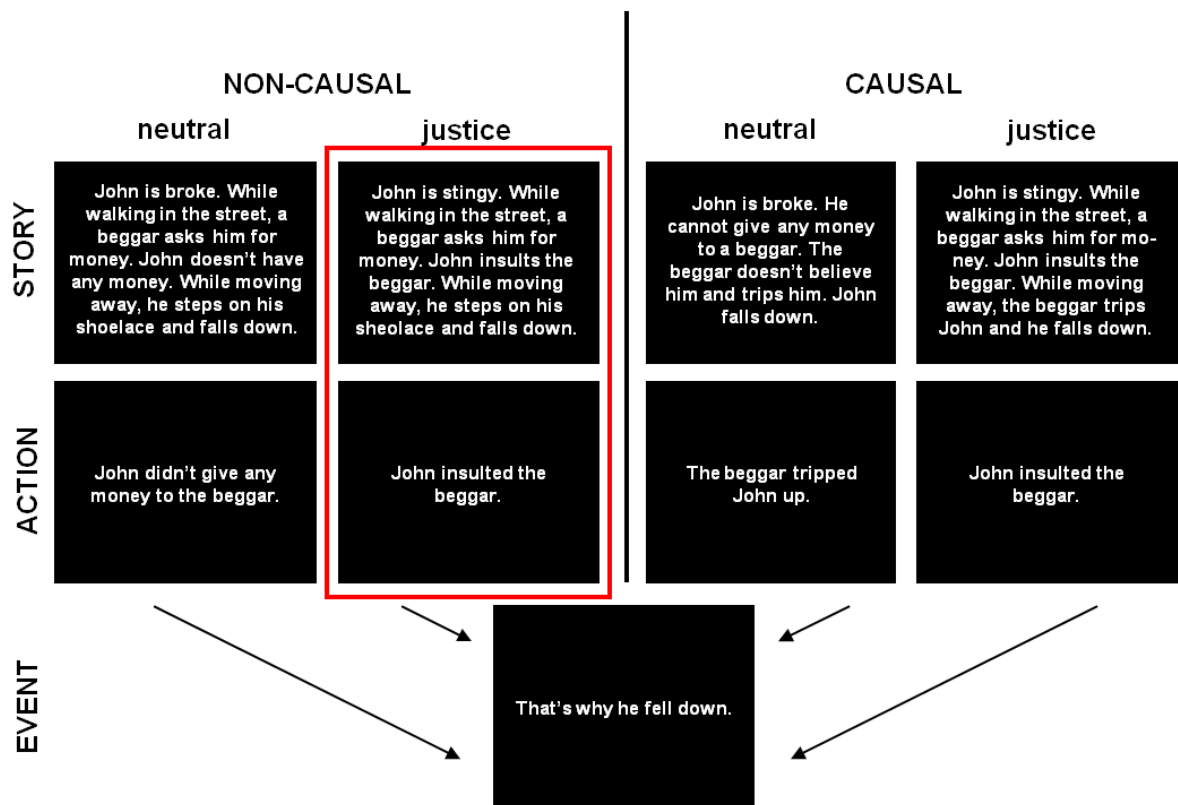


Figure 1. Schematic representation of the experimental design in Experiment 1.

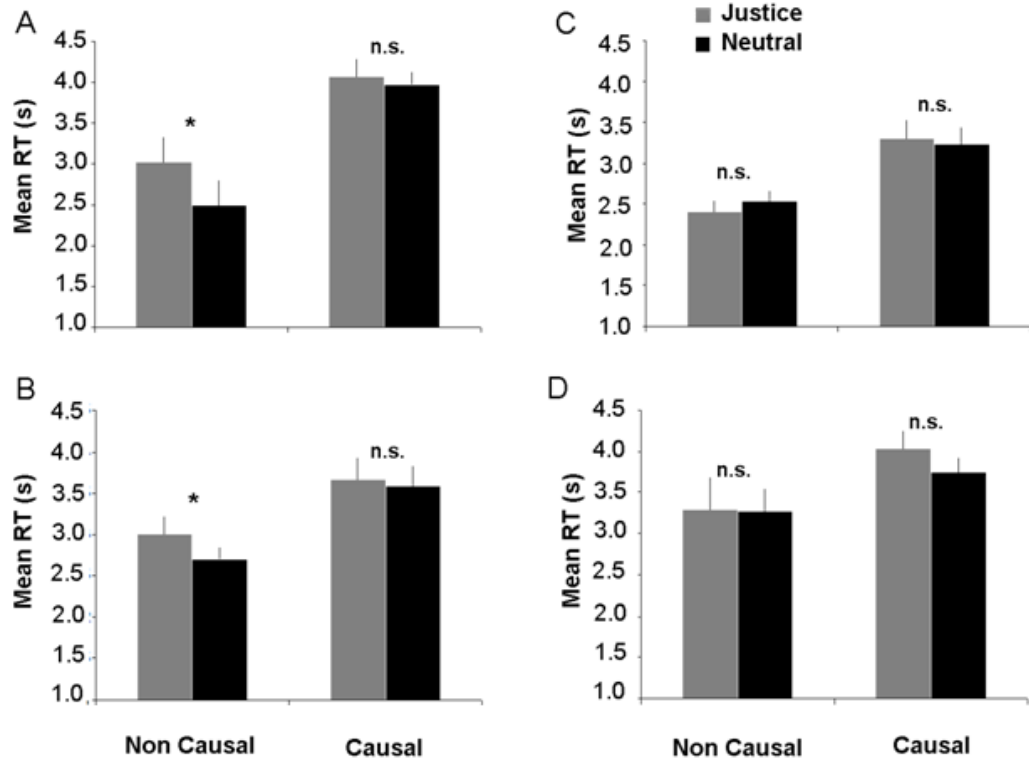


Figure 2. Mean reaction times and SEM for the final fragment in four Story types (e.g. “That’s why John fell down”). * indicates a significant difference at $P < 0.05$ or better on a Wilcoxon test.