

# Supplementary Material

## 1 Stimuli set

### 1.1 Experiment 1

We used 16 stimuli from Koenigs et al. (2007) from 4 conditions: non-moral (NM), impersonal (IM), low-conflict (LC) personal, and high-conflict (HC) personal. Although we selected moral dilemmas with higher mean emotionality ratings, we also considered prior exposure to them for the final set. In all problems, the choice was between taking an action and endorsing its omission. In NM and IM, the action is not categorized as either characteristically utilitarian or deontological (henceforth, D and U, respectively; see Greene, 2014 for the details on the use of utilitarianism). Barring two dilemmas from LC, the action was U in all personal dilemmas (LC and HC). Hence, the D alternative was always inaction in all moral dilemmas (LC, HC, IM) but the action was not necessarily U.

All the dilemmas used in Experiment 1 are listed below.

#### Non-moral

1. Standard Turnips\*

You are a farm worker driving a turnip-harvesting machine. You are approaching two diverging paths.

By choosing the path on the left you will harvest ten bushels of turnips. By choosing the path on the right you will harvest twenty bushels of turnips. If you do nothing your turnip-harvesting machine will turn to the left.

Would you turn your turnip-picking machine to the right in order to harvest twenty bushels of turnips instead of ten?

2. Generic Brand\*

You have a headache. You go to the pharmacy with the intention of buying a particular name-brand headache medicine. When you get there you discover that the pharmacy is out of the brand you were looking for.

The pharmacist, whom you've known for a long time and in whom you have a great deal of trust, tells you that he has in stock a generic product which is, in his words, "exactly the same" as the product you had originally intended to buy.

Would you purchase the generic brand instead of searching further for the name-brand product you were looking for?

3. Scheduling\*

You are in charge of scheduling appointments in a dentist's office. Two people, Mr. Morris and Mrs. Santiago have called to make appointments for next Monday. The only available times for next Monday are at 10:00 AM and at 3:00 PM.

Mr. Morris's schedule is rather flexible. He can have his appointment either at 10:00 AM or at 3:00 PM. Mrs. Santiago's schedule is less flexible. She can only have her appointment at 10:00 AM.

Would you schedule Mr. Morris for 3:00 PM so that both he and Mrs. Santiago can have their appointments next Monday?

\* indicates that the dilemma does not have a U action and/or D inaction. <sup>‡</sup> dilemma was altered slightly for relevance.

4. Scenic Route\*

An old friend has invited you to spend the weekend with him at his summer home some ways up the coast from where you are. You intend to travel there by car, and there are two routes that you can take: the highway and the coastal road.

The highway will get you to your friend's house in about three hours, but the scenery along the highway is very boring. The coastal route will get you to your friend's house in about three hours and fifteen minutes, and the scenery along the coastal road is breathtakingly beautiful.

Would you take the coastal route in order to observe the beautiful scenery as you drive?

High conflict (HC) personal dilemmas

5. Crying Baby\*

Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables.

Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death.

Would you smother your child in order to save yourself and the other townspeople?

6. Sophie's Choice\*

It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death. He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them. Would you bring one of your children to the laboratory in order to avoid having them both die?

7. Bomb 2\*

You are negotiating with a powerful and determined terrorist who is about to set off a bomb in a crowded area. Your one advantage is that you have his teenage son in your custody.

There is only one thing that you can do to stop him from detonating his bomb, which will kill thousands of people if detonated. To stop him, you must contact him over the satellite hook-up that he has established and, in front of the camera, break one of his son's arms and then threaten to break the other one if he does not give himself up.

Would you break the terrorist's son's arm in order to prevent the terrorist from killing thousands of people with his bomb?

8. Lifeboat 2\*

You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water—a few inches lower and it will sink.

The seas start to get rough, and the boat begins to fill with water. If nothing is done it

will sink before the rescue boats arrive and everyone on board will die. However, there is an injured person who will not survive in any case. If you throw that person overboard the boat will stay afloat and the remaining passengers will be saved. Would you throw this person overboard in order to save the lives of the remaining passengers?

### Low conflict (LC) personal dilemmas

#### 9. Plane Crash\*

Your plane has crashed in the Himalayas. The only survivors are yourself, another man, and a young boy. The three of you travel for days, battling extreme cold and wind. Your only chance at survival is to find your way to a small village on the other side of the mountain, several days away.

The boy has a broken leg and cannot move very quickly. His chances of surviving the journey are essentially zero. Without food, you and the other man will probably die as well. The other man suggests that you sacrifice the boy and eat his remains over the next few days.

Would you kill this boy so that you and the other man may survive your journey to safety?

#### 10. Hired Rapist\*

You have been dissatisfied with your marriage for several years. It is your distinct impression that your wife no longer appreciates you. You remember how she appreciated you years ago when you took care of her after she was mugged. You devise the following plan to regain your wife's affection.

You will hire a man to break into your house while you are away. This man will tie up your wife and rape her. You, upon hearing the horrible news, will return swiftly to her side, to take care of her and comfort her, and she will once again appreciate you.

Would you hire a man to rape your wife so that she will appreciate you as you comfort her?

#### 11. Architect\*

You are a young architect visiting one of your construction sites with your boss. Your boss is a despicable individual who makes everyone around him miserable including you.

It occurs to you that if you were to push him off of the building you are inspecting he would fall to his death and everyone would think it was an accident.

Would you push your boss off of the building in order to get him out of your life?

#### 12. Transplant

You are a doctor. You have five patients, each of whom is about to die due to a failing organ of some kind. You have another patient who is healthy.

The only way that you can save the lives of the first five patients is to transplant five of this young man's organs (against his will) into the bodies of the other five patients.

If you do this, the young man will die, but the other five patients will live.

Would you perform this transplant in order to save five of your patients?

### Impersonal (IM) dilemmas

#### 13. Lost Wallet\*

You are walking down the street when you come across a wallet lying on the ground. You open the wallet and find that it contains several hundred dollars in cash as well as the owner's driver's license.

From the credit cards and other items in the wallet it's very clear that the wallet's owner is wealthy. You, on the other hand, have been hit by hard times recently and could really use some extra money. You consider sending the wallet back to the owner without the cash, keeping the cash for yourself.

Would you keep the money you found in the wallet in order to have more money for yourself?

14. Illegal Lunch\*

You are a lawyer working on a big case. The judge presiding over the trial happens to be someone you knew from law school. The two of you were rather friendly back then, but now, decades later, it seems that your old friend barely remembers you. You're quite sure that if you were to talk to him over lunch, you could jog his memory and he would begin to see you as an old buddy, which would be very good for your work in this case. It's illegal for judges and lawyers working on the same case to meet socially.

Would you meet with this judge socially in order to help you win your case?

15. Stock Tip\*

You are a management consultant working on a case for a large corporate client. You have access to confidential information that would be very useful to investors. You have a friend who plays the stock market. You owe this friend a sizable sum of money.

By providing her with certain confidential information you could help her make a lot of money, considerably more than you owe her. If you did this, she would insist on canceling your debt. Releasing information in this way is strictly forbidden by federal law.

Would you release this information to your friend so that she will cancel your debt?

16. Resume\*

You have been trying to find a job lately without much success. You figure that you would be more likely to get hired if you had a more impressive resume.

You could put some false information on your resume in order to make it more impressive. By doing this you might ultimately manage to get hired, beating out several candidates who are actually more qualified than you.

Would you put false information on your resume in order to help yourself find employment?

## 1.2 Experiment 2

Experiment 2 had three conditions with 3 problems in each condition viz., non-moral, conflict moral and non-conflict moral problems. We selected moral dilemmas from Bago and De Neys (2019) and non-moral (NM) problems from Koenigs et al. (2007) for Experiment 2. All moral problems were characteristically impersonal as the U action did not cause harm directly (see Greene, 2014 for the distinction between personal and impersonal implied here). Conflict moral dilemmas had a clear utilitarian action and a deontological omission of it. On the other hand, non-conflict dilemmas were constructed such that both utilitarian and deontological principles ostensibly converge on the same alternative (see congruent and incongruent distinction from Conway and Gawronski (2013)). Hence, non-conflict dilemmas do not have distinct alternatives with one of them being U action and D omission. For the convenience of discussion, we call the action within these dilemmas U (which is the supposedly convergent option for both utilitarian and deontological principles).

All dilemmas used in the study are listed below.

### Non-moral

1. Broken VCR<sup>\*‡</sup>

You have brought your broken headphones to the local repair shop. The woman working at the shop tells you that it will cost you about Rs. 2000 to have it fixed. You noticed in the paper that morning that the electronics shop next door is having a sale on headphones and that a certain new headphone which is slightly better than your old one is on sale for Rs. 2000.

Would you buy new headphones instead of repairing the old ones?

2. Choosing classes<sup>\*‡</sup>

You are beginning your final year of college. In order to fulfill your graduation requirements you need to take a history class and a science class by the end of the year.

During the odd semester the history class you want to take is scheduled at the same time as the science class you want to take. During the summer semester the same history class is offered, but the science class is not.

Would you take the history class during the odd semester in order to help you fulfill your graduation requirements?

3. Investment Offer<sup>\*</sup>

You are at home one day when the mail arrives. You receive a letter from a reputable corporation that provides financial services. They have invited you to invest in a mutual fund, beginning with an initial investment of twenty thousand rupees.

As it happens, you are familiar with this particular mutual fund. It has not performed very well over the past few years, and, based on what you know, there is no reason to think that it will perform any better in the future.

Would you invest a thousand dollars in this mutual fund in order to make money?

### Conflict moral dilemmas

4. Iceberg

You are a radar operator overseeing vessel movement near Greenland. Due to sudden ice movement a boat carrying 11 passengers is about to crash into an iceberg. If nothing is done, all passengers will die. The only way to save the 11 passengers is for you to order the captain to execute an emergency maneuver that will sharply alter the course of the boat.

However, the maneuver will cause the boat to overrun a life raft carrying 3 people that is floating next to the iceberg and out of sight of the captain. The 3 people on the life raft will be killed if you order the captain to execute the maneuver, but the 11 people on the boat will be saved.

Would you order the maneuver to alter the course of the boat?

5. Gas explosion

You are the inspector of gas lines in a city. For some reason, the gas in a pipeline, which is running under a building, got on fire. If the fire reaches the building, it will explode, and will kill 12 people in it. You realize that the only way to stop the explosion of the building is to close the pipeline by pushing on a button, and divert the fire to a side-pipeline. If you do so, the 12 people will be saved.

However, above the side-line is another building with 4 people in it. If you push the button and divert the fire into the sideline, this building will explode and kill the 4

people in it, but the 12 in the building above the main line will be saved.

Would you push the button to divert the fire explosion?

6. Fumes

You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. The fumes are directly and quickly heading towards a room with 13 patients in it. If you do nothing the fumes will rise up into this room and cause their deaths. The only way to avoid the deaths of these patients is to hit a certain switch, which will cause the fumes to bypass the room and enter a second room instead.

However, you realize that 5 patients are in the second room. These 5 patients will be killed if you hit the switch and let the fumes bypass the first room, but the 13 patients in the first room will be saved.

Would you hit the switch to cause the fumes to be released?

### Non-conflict moral dilemmas

7. Submarine\*

You are responsible for the mission of a submarine, leading the operation from a control center on the beach. An onboard explosion has damaged the ship and collapsed the only access corridor between the upper and lower levels of the ship. As a result, water is quickly approaching the upper level of the ship. If nothing is done, 4 people in the upper level will be killed. You realize that the only way to save these people is to hit a switch in which case the path of the water to the upper level will be blocked and it will enter the lower level of the submarine instead.

However, you realize that 12 people are trapped in the lower level. If you hit the switch, these 12 people (who otherwise would survive) will die, but the 4 people in the upper level will be saved.

Would you hit the switch to divert the water to the lower level?

8. Mine\*

Due to an accident there are 3 miners stuck in one of the shafts of a copper mine. They are almost out of oxygen and will die if nothing is done. You are the leader of the rescue team. The only way for you to save them is to activate an emergency circuit that will transfer oxygen from a nearby shaft into the shaft where the 3 miners are stuck.

However, your team notices that 11 miners are trapped in the nearby shaft. If you activate the emergency circuit to transfer the oxygen, these 11 miners will be killed, but the 3 miners will be saved.

Would you activate the emergency circuit to divert the oxygen in the shaft?

9. Volcano\*

After a volcano eruption deadly hot lava is heading towards a nearby village. You are directing the rescue operations. There are 2 people standing on the roof of a house. If nothing is done, these 2 people will inevitably be killed by the lava stream. The only way to save these people is to order the construction of an emergency barrier that will divert the lava stream into an old river bed.

However, you suddenly receive the information that right along the old river bed 10 people are standing on the roof of a barn. If you order the construction of the emergency barrier and divert the lava to save the 2 people on the roof of the house, the 10 people on the roof of the barn will inevitably be killed.

Would you order the construction of the emergency barrier?

### 1.3 Experiment 3

Categorical syllogisms used in Experiment 3 were either single- or multiple-model.

Single-model syllogisms were of the form:

All A are B.

All B are C.

Therefore, all A are C. (valid)

**OR**

Therefore, all C are A. (invalid)

Multiple-model syllogisms were of the form:

Some A are B.

No B are C.

Therefore, some A are not C. (valid)

**OR**

No A are B.

Some B are C.

Therefore, some A are not C. (invalid)

In this experiment, participants were tasked with solving eight syllogistic reasoning problems.

We utilized a within-subject 2x2 design with two factors: validity (assessing whether the conclusion logically follows from the premises) and believability (evaluating whether the conclusion is believable). To manipulate the believability of the conclusions, we drew on materials from Robison and Unsworth (2017) and Evans et al. (1983).

All the stimuli used are listed below.

#### Valid-Believable

1. Lollipops  
All lollipops are candy.  
All candy is made out of sugar.  
Therefore all lollipops are made out of sugar.
2. Vicious dogs  
Some highly trained dogs are vicious.  
No vicious dogs are police dogs.  
Therefore some highly trained dogs are not police dogs.

#### Valid-Unbelievable

3. College professors  
All college professors are doctors.  
All doctors have medical degrees.  
Therefore all college professors have medical degrees.
4. Priests  
Some priests are young.  
No young people are religious people.  
Therefore some priests are not religious people.

### Invalid-believable

5. Sea creatures

All animals that spend the majority of their lives in the water are sea creatures.

All sea creatures are animals that are able to swim.

Therefore all animals that are able to swim spend the majority of their lives in the water.

6. Cigarettes

No addictive things are inexpensive.

Some inexpensive things are cigarettes.

Therefore some addictive things are not cigarettes.

### Invalid-unbelievable

7. Cubes

All objects with six sides are cubes.

All cubes are objects with sides of equal area.

Therefore all objects with sides of equal area are objects with six sides.

8. Deep sea divers

No deep sea divers are nutritionists.

Some nutritionists are good swimmers.

Therefore some deep sea divers are not good swimmers.

## **References**

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