

Supplementary materials – Texts (or descriptions) of the decision problems used in the studies included in the meta-analysis

Keysar et al. (2012, Psychological Science)

Asian Disease problem

Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made.

Gain frame version: If you choose Medicine A, 200,000 people will be saved. If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved. Which medicine do you choose?

Loss frame version: If you choose Medicine A, 400,000 people will die. If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 will die. Which medicine do you choose?

Loss Aversion problem

“We presented each participant with 18 equal-odds bets, all with positive expected value, either in Korean or in a foreign language, English. Half the bets had high stakes (e.g., lose ₩119,000 or win ₩170,000), and half had low stakes (e.g., lose ₩200 or win ₩500; ₩1,000 is roughly equal to \$1). People routinely show loss aversion in situations involving large amounts, but there is evidence that they are not loss averse in the case of insignificant amounts (Hanrinck, Van Dijk, van Beest, & Mersmann, 2007). Therefore, we expected the language in which the bets were presented to affect decisions mainly in the case of the larger bets” (p. 665).

Myopic Loss Aversion problem

Each participant received \$15 in cash. In each round, the participant removed one dollar bill from his or her remaining cash and decided whether to use it in a bet. For each bet, the experimenter flipped a coin in plain view while the participant called out “heads/cara” or “tails/cruz.” If the participant was correct, he or she kept the dollar and received an extra \$1.50. Otherwise, he or she lost the dollar. If the participant declined the bet, he or she kept the dollar and moved on to the next round. In each round, the expected value of taking the bet was \$1.25. Participants knew that they would keep the money they accrued (p. 666).

Costa et al. (2014, Cognition)

Asian Disease problem

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Loss frame version: If you choose Medicine A, 400,000 people will die. If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 will die. Which medicine do you choose?

Financial Crisis problem

Gain version: If you choose Action A, 200,000 euros will be saved. If you choose Action B, there is a 33.3% chance that 600,000 euros will be saved and a 66.6% chance that no money will be saved.

Which action do you choose?

Loss version: If you choose Action A, 400,000 euros will be lost. If you choose Action B, there is a 33.3% chance that no money will be lost and a 66.6% chance that 600,000 euros will be lost. Which action do you choose?

Ticket/Money Lost problem

Ticket lost: A woman has bought two tickets to go to the theatre. Each ticket costs 80 euros. When she arrives at the theatre, she opens her bag and discovers that she has lost the tickets. Do you think she will buy the tickets to enter the theatre?

Money lost: A woman goes to the theatre and wants to buy two tickets that cost 80 euros each. She arrives at the theatre, opens her bag, and discovers that she has lost the 160 euros with which she was going to buy the tickets. She could use her credit card. Do you think she will buy the tickets to enter the theatre?

Discount problem

Discount on 15 euros: Imagine that you want to buy a jacket for 125 euros and a calculator for 15 euros. The salesman tells you that the calculator you want to buy is on offer for 10 euros at their other shop, located 20 min drive away. Would you make the trip to the other shop?

Discount on 125 euros: Imagine that you want to buy a jacket for 15 euros and a calculator for 125 euros. The salesman tells you that the calculator you want to buy is on offer for 120 euros at their other shop, located 20 min drive away. Would you make the trip to the other shop?

Geipel et al. (2015, Plos One)

Footbridge dilemma

A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Is it appropriate for you to push the stranger on to the tracks in order to save the five workmen?

Trolley dilemma.

You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to save the lives of the five workmen?

Cipolletti et al. (2016, Philosophical Psychology)

Button dilemma.

An unoccupied runaway train is going down the tracks toward five innocent people. If the train continues on its present course, it will kill all of these people. You notice that there is a button nearby which will direct the train to a sidetrack. On the sidetrack, the train will kill only one innocent person instead of the five people on the original track. Morally speaking, should you push the button to direct the train to the sidetrack?

Footbridge dilemma.

An unoccupied runaway train is going down the tracks toward five innocent people. If the train continues on its present course, it will kill all of these people. You are on a bridge over the tracks, between the approaching train and the five people. The only way to save the lives of the five people is to push an innocent person that you do not know off of the bridge and onto the tracks. This person will die, but this will stop the train before it gets to the five people. Morally speaking, should you push this person onto the tracks below?

Switch dilemma

An unoccupied runaway train is going down the tracks toward five innocent people. If the train continues on its present course, it will kill all of these people. You notice a button nearby which will direct the train to a sidetrack. On the sidetrack, the train will not hit anything or harm anyone. Morally speaking, should you push the button to direct the train to the sidetrack?

Winksel et al. (2016, Journal of Cognitive Psychology)

Asian Disease problem

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Financial Crisis problem

Recently, a serious financial crisis has started. Without any action, the company you manage will lose 6,000,000 Baht. In order to save this money, two types of actions are possible.

Gain version: If you choose Action A, 2,000,000 Baht will be saved. If you choose Action B, there is a 33.3% chance that 6,000,000 Baht will be saved and a 66.6% chance that no money will be saved. Which action do you choose?

Loss version: If you choose Action A, 4,000,000 Baht will be lost. If you choose Action B, there is a 33.3% chance that no money will be lost and a 66.6% chance that 6,000,000 Baht will be lost. Which action do you choose?

Corey et al. (2017, Journal of Experimental Psychology: Learning, Memory, & Cognition)

Switch dilemma.

A train is going down a track very fast toward five people. The train has a problem and cannot be stopped. Five people will die if you stay on this track. There is another track that you can use to divert the train. At the end of this track there is one man that will die if you change the track. Would you change the track?

Footbridge dilemma.

A train is going down a track very fast toward five people. The train has a problem and cannot be stopped unless a heavy weight is dropped on the track. There is a very fat man next to you—your only way to stop the train is to push him onto the track, killing him to save five people. Would you push him?

Hospital dilemma

You are working in a hospital. There is a fire in the street, and there is smoke coming through the hospital's ventilation system. In one room of the hospital there are five patients. In another room there is only one patient. If you do nothing the smoke will go into the room with the five patients and they will die. There is a button that diverts the ventilation system. If you push the button, the smoke will go into the room with one patient and the patient will die, but the five patients in the other room will be safe. Would you push the button?

Terrorist dilemma

You are negotiating with terrorists to save a group of six tourists that have been captured. The leader of the terrorists gives you the choice: If you choose one tourist and shoot him, the other five tourists will be safe; if you decide not to kill anybody, the terrorist will kill five tourists and one will be safe. Would you kill one tourist?

Button dilemma

A train is going down a track very fast toward five people. The train has a problem and cannot be stopped, unless a heavy weight is dropped on the track. There is a very fat man next to the track - your only way to stop the train is to push a button that will make him fall onto the track, killing him to save five people. Would you push the button?

Disable Footbridge dilemma.

A train is going down a track very fast toward five people. The train has a problem and cannot be stopped, unless a heavy weight is dropped on the track. There is a very fat man next to you - your only way to stop the train is to push him onto the track. If you push the fat man, he will be disabled, unable to walk, for the rest of his life. Would you push him?

Injury Footbridge dilemma

A train is going down a track very fast toward five people. The train has a problem and cannot be stopped, unless a heavy weight is dropped on the track. There is a very fat man next to you - your only way to stop the train is to push the man onto the track, causing him serious injuries, to save these five people. Would you push him?

Cavar et al. (2018, Journal of Multilingual and Multicultural Development)

Footbridge dilemma.

In the path of a runaway train car are five (nineteen) railway workmen who will surely be killed unless you, a bystander, do something. You are standing on a pedestrian walkway that arches over the tracks next to a large stranger. Your body would be too light to stop the train, but if you push the stranger onto the tracks, killing him, his large body will stop the train. (You try to block out the terrible images of him falling and of his body being impacted by the train). In this situation, would you push him?

Hostage dilemma.

You are traveling with five (nineteen) other peace advocates in a war-torn country when your group is taken hostage by a group of terrorists. After a week, the terrorists' demands have not been met, and they offer you a choice: either they will kill all of you, or if you execute one of your fellow hostages, you and the others are free to go (You are handed a knife, and your fellow hostages scream in terror, pleading for their lives). In this situation, would you execute one of your fellow hostages?

Submarine dilemma

You are the captain of a small military submarine traveling underneath a large iceberg. An on-board explosion has dramatically decreased the oxygen supply and has injured a member of the crew. He may die from his injuries. The remaining oxygen is not sufficient for the entire six (twenty) – man crew to make it to the surface. If you shoot the injured crewmember, there will be just enough oxygen for everyone else to survive (As you load your gun, the injured man desperately pleads for you not to kill him). In this situation, would you shoot the crewmember?

Soldier dilemma.

You are leading a group of soldiers returning from a completed mission in enemy territory when one of your men steps in a trap. He is injured, and the trap is connected to a device that alerts the enemy to your presence. If the enemy finds your group, all six (twenty) of you will die. If you leave him behind, he will be killed, but the rest of the group will escape safely. (You hear him crying, desperately in need of help, begging you not to leave him there to be killed). In this situation, would you leave him behind?

Boat dilemma.

You are on a small ship, a fire breaks out, and the ship has to be abandoned. Because your tiny life raft is carrying more than its capacity, it is sitting dangerously low in the water. The seas get rough and the raft begins to fill with water. Unless you do something, all six (twenty) of you will drown. There is an injured person on-board who may die either way. If you throw him overboard, everyone else will be saved (Lying there almost helpless, he whimpers, knowing he will drown because he is unable to swim in his condition). In this situation, would you throw him overboard?

Surgeon dilemma.

You are a surgeon with a number of patients. Five (Nineteen) of them need organ transplants. Each of them needs a different organ or they will surely die. You have another patient who is healthy and would be an ideal organ donor for the others. If you transplant his organs (against his will) into the bodies of the other patients, they will live but he will die. (You approach him with anesthesia and a scalpel. He pleads with you not to take his life). In this situation, would you perform this transplant?

Brouwer (2019, Journal of Multilingual and Multicultural Development)

Footbridge dilemma

A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Is it appropriate for you to push the stranger on to the tracks in order to save the five workmen?

Crying Baby dilemma

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. Is it appropriate for you to smother your child in order to save yourself and the other townspeople?

Lost Wallet dilemma

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 euros in cash as well 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. Is it appropriate for you to keep the money you found in the wallet in order to have more money for yourself?

Switch dilemma

You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to save the lives of the five workmen?

Taxes dilemma

You are the owner of a small business trying to make ends meet. It occurs to you that you could lower your taxes by pretending that some of your personal expenses are business expenses. For example, you could pretend that the stereo in your bedroom is being used in the lounge at the office, or that your dinners out with your partner are dinners with clients. Is it appropriate for you to pretend that certain personal expenses are business expenses in order to lower your taxes?

Vitamins dilemma

You are the leader of a mountaineering expedition that is stranded in the wilderness. Your expedition includes a family of six that has a genetically caused vitamin deficiency. A few people's kidneys contain large amounts of this vitamin. There is one such person in your party. The only way to save the lives of the six members of this family is to remove one of this man's kidneys so that the necessary vitamins may be extracted from it. The man will not die if you do this, but his health will be compromised. The man is opposed to this plan, but you have the power to do as you see fit. Is it appropriate for you to forcibly remove this man's kidney in order to save the lives of the six vitamin-deficient people?

Hayakawa et al. (2019, Quarterly Journal of Experimental Psychology)

Taking a Bet problem (the text has been slightly adapted to make it more general).

Participants were endowed with an amount of money. Participants were informed that they would be playing 20 rounds of games with that money and that, at the end of the games, they kept any money that was earned or left. For each round, they made a choice between paying a coin (e.g., 1\$) and moving on to the next bet or flipping a coin for a 50/50 chance to either lose nothing or lose more than a coin. For each of the 20 identical bets, those in the "Good Gamble" conditions would lose more than a coin (e.g., 1.50\$) if they lost the coin toss. Those assigned to the "Bad Gamble" conditions stood to lose more (e.g., 2.50\$), if they lost the coin toss.

In each round, participants were asked whether they would like to pay or gamble. If they decided to pay, they

gave the experimenter the coin and moved on to the next round. If they decided to gamble, they called either "heads" or "tails" and flipped the coin. If they won the bet they moved on to the next round without paying anything. Otherwise, they paid depending on whether they were in the good or bad gamble group,

Brouwer (2020, Bilingualism: Language and Cognition)

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the tracks in order to save the five workmen?

Crying Baby dilemma. 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. Is it appropriate for you to smother your child in order to save yourself and the other townspeople?

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Switch (or Trolley) dilemma. You are at the wheel of a run- away trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single work- man. Is it appropriate for you to hit the switch in order to save the lives of the five workmen?

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Miozzo et al. (2020, Cognition)

Asian Disease problem

Gain frame: Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made. If you choose Medicine A, 200,000 people will be saved. If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved. Which medicine do you choose?

Loss frame: Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made. If you choose Medicine A, 400,000 people will die. If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 people will die. Which medicine do you choose?

Footbridge dilemma

An out-of-control trolley is moving toward five workers who will be killed if the trolley continues on its path. You are standing on a footbridge above the track, halfway between the oncoming trolley and the five workers. Standing beside you on the footbridge is a fat stranger. The only way to save the lives of the five workers is to push the person off the bridge. If the person falls onto the track, his fat body will stop the train. If you push him, this person will die, but the five workers will survive. Would you push this person off the bridge to save the five workers?

Texts of problems used by Costa et al. (2014, Plos One) and Muda et al. (2017, Journal of Experimental Psychology: Learning, Memory, & Cognition) were not available.