

# Supporting Information

Young et al. 10.1073/pnas.0914826107

## SI Materials and Methods

**Subjects.** All subjects were native English speakers, had normal or corrected-to-normal vision, and gave written informed consent in accordance with the requirements of the Internal Review Boards at the Massachusetts Institute of Technology and Beth Israel Deaconess Medical Center. All subjects tolerated all TMS sessions without any complications or side effects.

Two of the 10 subjects in experiment 1 were excluded: one before any TMS session because of psychoactive medication use and the other following the first (control) TMS session because he judged attempted harms (3.7) as more permissible than accidental harms (2.5), unlike the pattern observed in our pilot study and in all other participants in the current study. In our pilot study, 11 subjects were run using a four-point scale (means were converted to a seven-point scale), and 11 subjects were run using a seven-point scale. Twenty-one of 22 subjects judged attempted harm (mean = 1.9, SD = 1.3) as less permissible than accidental harm (mean = 5.2, SD = 0.9). This pattern was replicated in the control TMS session of the current study, with the exception of 1 subject, who was a statistical outlier in this regard.

**Debriefing.** After each TMS session, subjects' cognitive and behavioral functions were assessed to ensure normal functioning using the Mini-Mental State Examination and a detailed neurological and medical examination as well as an explicit questionnaire for possible side effects of TMS (1). Subjects were debriefed after the second TMS session as to the nature of the experiment; one subject noted experiencing a subjective difference between sessions, thinking she made more outcome-based moral judgments in the RTPJ vs. control session but had no explanation for the difference.

## Scenarios

Scenarios are organized in the following order:

1. Background: information to set the scene (identical across all conditions), 6 s
2. Foreshadow: information indicating the outcome (neutral, negative), 6 s
3. Belief: the protagonist's belief about the situation (neutral, negative), 6 s
4. Experiment 1. Action: the protagonist's action and its outcome (neutral, negative)
5. Experiment 2. Action: the protagonist's action (without outcome information)

**Coffee.** Grace and her friend are taking a tour of a chemical plant. When Grace goes over to the coffee machine to pour some coffee, Grace's friend asks for some sugar in hers. There is white powder in a container by the coffee.

The white powder is just the regular sugar that the scientists use each day, and is therefore perfectly safe to have in coffee.

The white powder is a very toxic substance left behind by a scientist, and is therefore deadly when ingested in any form.

The container is labeled "sugar," so Grace believes that the white powder by the coffee is sugar left out by the kitchen staff.

The container is labeled "toxic," so Grace believes that the white powder is a toxic substance left behind by a scientist.

Grace puts the substance in her friend's coffee. Her friend drinks the coffee and is fine.

Grace puts the substance in her friend's coffee. Her friend drinks the coffee and dies.

Putting the substance in was:

**Laboratory.** Dan is giving a visitor a tour of a laboratory. Before visitors enter the testing room, all test tubes containing disease antigens must be contained in a chamber by flipping a switch. A repairman has just come to fix the switch, which had been broken.

The switch has been successfully repaired, so the test tubes are quite safely contained. Thus, anybody who enters the room will be safe and unexposed.

The switch is still broken, so the test tubes are out in the open. Thus, anybody who enters the room will contract a deadly disease and die.

Dan believes that the switch has been fixed after a conversation with the repairman, so he believes it is safe for the visitor to enter.

Dan believes that the switch is still broken after a conversation with the repairman, so he believes it is not safe for the visitor to enter.

Dan tells the visitor to enter the testing room. The visitor does not contract any disease and is fine.

Dan tells the visitor to enter the testing room. The visitor contracts a deadly infectious disease.

Telling the visitor to enter was:

**Jellyfish.** Janet and her neighbor are kayaking in a part of the ocean with lots of jellyfish. Janet's neighbor asks her if she should go for a swim.

It is perfectly safe to swim in the ocean, because the jellyfish do not sting and are totally harmless.

It is not safe to swim in the ocean, because the jellyfish sting and their stings are fatal.

Because Janet read information that said the ocean's jellyfish are harmless, she believes that it is quite safe to swim in the ocean.

Because Janet read information that said the ocean's jellyfish are deadly, she believes that it is not safe to swim in the ocean.

Janet tells her neighbor to go for a swim. Her neighbor does, enjoys the swim, and is just fine.

Janet tells her neighbor to go for a swim. Her neighbor does, gets stung by jellyfish, and dies.

Telling her neighbor to swim was:

**Bridge.** Ray and his girlfriend are hiking. They come across a long narrow bridge that spans a steep canyon.

The bridge happens to be extremely sturdy and can easily carry the weight of many people at once.

The bridge happens to be extremely unsteady and cannot carry the weight of even one very light person.

Ray believes that whoever walks on the bridge will cross the canyon quite safely, because the bridge is maintained by the national park.

Ray believes that whoever walks on the bridge will break the bridge and fall into the canyon, because the bridge looks unsteady and old.

Ray says nothing as his girlfriend starts walking across the bridge. His girlfriend reaches the other side safely.

Ray says nothing as his girlfriend starts walking across the bridge. His girlfriend breaks the bridge and falls to her death.

Saying nothing was:

**Pool.** Leah is walking by a neighbor's swimming pool when she sees a child about to dive in. The child is about to dive into the deep end and have fun swimming around and playing all day.

The child is about to dive into the shallow end and smack his head very hard on the concrete bottom of the pool.

Because of a label on the side of the pool, Leah believes that the child is about to dive safely into the deep end and swim around.

Because of a warning sign at the side of the pool, Leah believes that the child is about to dive into shallow water and break his neck.

Leah walks by, without saying anything to the child. The child dives in and is fine.

Leah walks by, without saying anything to the child. The child dives in and breaks his neck.

Walking by was:

**Mushrooms.** Lauren and an acquaintance are camping in the woods. Lauren spots some wild mushrooms growing along the campsite. Lauren studies the mushrooms and consults her plant life guide.

The mushrooms happen to be edible and delicious. They are the kind that one can buy in the supermarket and put in salad.

The mushrooms happen to be lethal and tasteless. They are the kind that result in painful convulsions and, ultimately, death.

Lauren sees a picture of an edible mushroom in her book that looks just like these mushrooms at the campsite, so she believes that the mushrooms are edible.

Lauren sees a picture of a lethal mushroom in her book that looks just like these mushrooms at the campsite, so she believes that the mushrooms are lethal.

Lauren offers the mushrooms to her acquaintance. Her acquaintance eats them and finds them very tasty.

Lauren offers the mushrooms to her acquaintance. Her acquaintance eats them and starts convulsing after 10 min.

Offering the mushrooms was:

**Latex.** Anne sees a patient for a routine check-up. Anne normally uses latex gloves to examine her patients.

This patient has been in contact with latex before and, like most people, does not have an allergy to latex.

This patient has a lethal allergy to latex and cannot be examined with latex without immediately going into shock.

Having read the information in the patient's records, Anne believes that the patient is not allergic to latex and using latex gloves to examine him poses no risk to his health.

Having read the information in the patient's records, Anne believes that the patient is highly allergic to latex and using latex gloves to examine him will result in his death.

Anne puts on latex gloves and examines her patient. The patient is fine.

Anne puts on latex gloves and examines her patient. The patient goes into shock.

Using latex gloves was:

**Motorboat.** George is driving his motorboat in the bay on his way home. He spots a swimmer in the far distance.

The swimmer is, in fact, fine and is waving at George for fun as he does with people in the bay.

The swimmer is, in fact, drowning and is waving frantically at George for help.

George sees the swimmer waving and believes that the swimmer is waving an enthusiastic "hello."

George sees the swimmer waving and believes that the swimmer is drowning and waving desperately for help because his arm motions are so emphatic.

George drives home, leaving the swimmer behind. The swimmer is fine.

George drives home, leaving the swimmer behind. The swimmer drowns.

Leaving the swimmer behind was:

**Asthma.** Erica is driving home when she sees a runner by the side of the road. The runner is bent over and has one hand on his chest. There is an empty asthma inhaler on the ground.

The runner is just short of breath and has stopped to rest for a moment before continuing his long jog.

The runner is having a serious asthma attack and needs to get to a hospital immediately before he goes into shock.

Because Erica does not see the inhaler, she believes that the runner has just stopped to catch his breath and will continue his jog shortly.

Because Erica sees the inhaler and the gasping runner, she believes that the runner is having an asthma attack and must get to a hospital immediately.

Erica continues to drive, leaving the runner. The runner catches his breath and is fine.

Erica continues to drive, leaving the runner. The runner collapses and dies.

Leaving the runner behind was:

**Vitamin.** Gil is instructed by a doctor to give his senile wife pills for her heart disease. The doctor says that she must not intake vitamin K within an hour to take the pills safely. One day, his wife tries a new kind of fruit.

The new kind of fruit does not have vitamin K, so it is safe for Gil's wife to take the pills right away.

The new kind of fruit is high in vitamin K, so it is deadly for Gil's wife to take the pills right away.

Gil does his research and believes that the new kind of fruit does not have vitamin K and that it is safe to give her the pills.

Gil does his research and believes that the new kind of fruit is high in vitamin K and that it is not safe to give her the pills.

Gil gives his wife the pills right away. His wife is just fine.

Gil gives his wife the pills right away. His wife dies of heart failure.

Giving the pills was:

**Sesame.** Kate is a waitress preparing to take a meal out to a customer's table. The customer is with his friends, and he orders a meal that calls for sesame seeds.

The customer happens to love sesame seeds and will have no problem at all if he eats the sesame seeds in his meal.

The customer happens to be highly allergic to sesame seeds and will most likely die if he eats them in his meal.

After overhearing part of the customer's conversation with his friends, Kate believes that the customer loves sesame seeds.

After overhearing part of the customer's conversation with his friends, Kate believes that the customer is highly allergic to sesame seeds.

Kate puts the sesame seeds in. The customer enjoys his meal and is fine.

Kate puts the sesame seeds in. The customer eats his meal and dies.

Putting the sesame seeds in was:

**Bike.** Ginny's classmate wants to borrow her bike to go mountain biking. Ginny's bike has just come back from the repair shop. The brakes had not been working.

The brakes on Ginny's bike are working perfectly now, so the bike is safe to ride.

The brakes on Ginny's bike still are not working at all, so the bike is very dangerous to ride.

The people at the repair shop told Ginny that the brakes are fully fixed now and gave her a demonstration to explain how they were fixed, so she believes the bike is safe.

The people at the repair shop told Ginny that the brakes are still broken and gave her a demonstration to explain why they are not fixed, so she believes the bike is unsafe.

Ginny lends the bike to her classmate. Her classmate bikes up a mountain and has a wonderful time.

Ginny lends the bike to her classmate. Her classmate bikes off a cliff on the side of the mountain road because she cannot brake.

Lending the bike was:

**Iron.** Josephine and her little sister are in the bathroom doing makeovers by the sink. Josephine had straightened her hair earlier in the day using a straightening iron. The iron is still on the sink.

Josephine's mother had turned the button on the iron off 3 h ago, so it is no longer hot and is perfectly safe to touch.

Josephine's mother had just used the iron herself 5 min ago, so it is still extremely hot and could cause severe burns.

Because the cord on the iron was unplugged, Josephine believes that it is no longer hot and cannot burn her sister.

Because the cord on the iron is still in the socket, Josephine believes that it is still hot and could easily burn her sister.

Josephine lets her sister continue to play by the sink. Her sister's arm hits the iron, but it is okay because the iron is cold. They have fun continuing their makeovers.

Josephine lets her sister continue to play by the sink. Her sister's arm hits the iron, and she gets badly burned. She cries hysterically all the way to the emergency room.

Letting her sister continue to play by the sink was:

**Meatloaf.** Rebecca works at a day care program. For lunch, Rebecca plans to make meatloaf for all the children. She opens a package of ground beef to make the meatloaf.

The meat is actually completely fresh, because the package was tightly sealed while stored in the refrigerator; thus, the meat is safe to eat.

The meat has some invisible but very deadly bacteria on it because of a small tear in the seal; thus, the meat is not safe to eat.

Rebecca believes that the ground beef is perfectly safe to eat, because the expiration date on it is 2 weeks away from now.

Rebecca believes that the ground beef is not safe to eat, because the expiration date on it passed 2 weeks ago.

Rebecca makes meatloaf out of the ground beef and serves it to the children. The children eat the meal and find it delicious. They are quite full afterward.

Rebecca makes meatloaf out of the ground beef and serves it to the children. The children suffer from diarrhea and are hospitalized with severe food poisoning.

Giving the meatloaf to the children was:

**River.** Jacob and his friend are rafting down the Colorado River. Jacob's friend is a novice. They stop by the bank to have a swim. Jacob's friend starts to swim downstream.

The next segment of the river is very tame this year. It is very easy to swim through, and the scenery is particularly nice.

The next segment of the river is very rough and fast this year. It is full of gigantic boulders that make it very dangerous to swim through.

Because Jacob has rafted down this part of the Colorado River before, he believes the next segment is very tame and gentle. He thinks his friend will be able to enjoy the scenery.

Because Jacob has rafted down this part of the Colorado River before, he believes that the next segment is very rough and dangerous. He thinks that the current will be too strong for his friend.

Jacob silently watches as his friend swims downstream. He swims safely down the next segment of the river.

Jacob silently watches as his friend swims downstream. He gets thrown by the current and crashes into a gigantic boulder.

Silently watching as his friend starts swimming was:

**Logan Airport.** Andrew works at Logan Airport. He is in charge of ensuring that the runways are clear of debris that could damage

planes during takeoff. A plane is about to take off on a distant runway.

The distant runway has been completely cleared. It is ready for the plane to use for takeoff.

The distant runway has not yet been cleared. There is potentially damaging debris on it.

Andrew checks with his supervisor and believes that the runway has already been cleared of any debris. He thinks that it is safe for the plane to taxi.

Andrew checks with his supervisor and believes that the runway has not yet been cleared of debris. He thinks that it may be unsafe for the plane to taxi.

Andrew gives the "OK" for the takeoff. The plane takes off on time from the distant runway. The takeoff is safe and without incident.

Andrew gives the "OK" for the takeoff. The plane takes off and suffers serious damage from some debris. Three passengers are killed.

Not clearing the runway was:

**Tracks.** Tyler works for a company that builds railway tracks for passenger trains. One day, Tyler's job is to fasten the track rods with an extra spike at dangerous corners.

The night team working the previous night was very efficient, and they have already added extra spikes to all corners in the first segment of the track. The whole segment is entirely safe.

The night team working the previous night was running late, so they did not finish adding extra spikes to all corners in the first segment of track. In some places, the track is still dangerous.

Tyler checks the work logs of the night team and believes that they finished adding the spikes to the whole first segment of track, so that part of the track is safe.

Tyler checks the work logs of the night team and believes that they added spikes to only part of the first segment of track, so some corners are still unsafe.

Tyler skips the whole first segment of track. The railway track is opened for commercial use, and passenger trains are able to pass on the tracks safely.

Tyler skips the whole first segment of track. The railway track is opened for commercial use, and a passenger train derails and crashes, killing 125 passengers.

Not fastening the corners on the first segment of track was:

**Harness.** Stacey and her friend are going rock climbing, and they are going to use harnesses to scale a gigantic cliff. Stacey's friend starts to put on the new harness.

The new harness is a top-of-the-line model, in fine working condition, and completely safe to use.

The clamp on the new harness is actually subtly flawed, so the whole harness is incredibly unsafe to use.

Because Stacey bought the harness from a quality sports store, Stacey believes that the harness is in prime functioning condition.

Because the clamp on the harness does not audibly click into place, Stacey believes that the harness is malfunctioning and not safe to use.

Stacey straps her friend into the harness. Her friend scales the cliff safely and enjoys the exhilarating experience.

Stacey straps her friend into the harness. Halfway up the cliff, the harness gives way and her friend plummets to her death.

Strapping her friend into the new harness was:

**Igloo.** Sarah built a huge play igloo out of snowballs yesterday. Her friend is over today, and she is totally intrigued by the igloo.

The igloo is sturdily built. The snowballs have frozen solid into strong walls, so it is fine for Sarah's friend to play inside all she wants.

The snowballs in the igloo walls are not properly balanced and will cave in at moderate movement, so it is not safe for Sarah's friend to go inside.

Because she has built igloos like this many times before, Sarah believes that the igloo has strong walls and ceilings and is safe to play in.

Because her mother warned her about playing in igloos like this, Sarah believes that the igloo could cave in and is not safe to play in.

Sarah tells her friend to go inside the igloo. Her friend plays around inside and has a great time pretending she is an Eskimo.

Sarah tells her friend to go inside the igloo. Her friend jumps because she is excited, and the icy snowballs crash in on her head.

Telling her friend to go inside the igloo was:

**Ham.** Noel and a friend are having lunch on Saturday. They are making sandwiches with stuff from Noel's refrigerator, when Noel's friend says she would prefer a ham sandwich.

The ham in the refrigerator is high quality and was purchased just a day ago. It is fresh and ready to be used in sandwiches.

The ham in the refrigerator was purchased a week ago and has since become slightly spoiled, so it is not safe to eat.

Because Noel's mom always shops for meats only on Fridays, Noel believes that the ham in the refrigerator is fresh and is safe to eat.

Because Noel's mom usually shops for meat only on Sundays, Noel believes that the ham in the refrigerator is very old and not safe to eat.

Noel makes a ham sandwich for her friend. Her friend enjoys the sandwich, and they go outside to play afterward.

Noel makes a ham sandwich for her friend. Her friend eats the sandwich and throws up all night from food poisoning.

Making the ham sandwich for her friend was:

**Popcorn.** Matt is babysitting at his cousin's house. They are eating popcorn. Suddenly, they hear a loud beeping noise coming from the kitchen. Matt's cousin gets up to investigate.

The beeping noise is from a smoke detector responding to leftover smoke coming from the microwave in which Matt and his cousin burned popcorn. The situation in the kitchen is not dangerous.

The beeping noise is from a carbon monoxide detector in the kitchen. Deadly carbon monoxide is escaping from the furnace under the kitchen. The kitchen is now dangerous.

Matt believes that the noise is the smoke detector, because they had just burned a bag of popcorn. He thinks going to the kitchen to turn off the beeping device is a very good idea.

Matt believes that the noise is a carbon monoxide detector because his carbon monoxide detector makes the same sound. He thinks going to the kitchen to turn off the beeping device could cause his cousin to pass out.

Matt watches quietly while his cousin goes into the kitchen. His cousin goes into the kitchen and returns laughing, saying that the burnt popcorn had made the smoke alarm go off.

Matt watches quietly while his cousin goes into the kitchen. His cousin goes into the kitchen and, while fidgeting with the device, passes out from carbon monoxide inhalation.

Just watching while his cousin went into the kitchen was:

**Veterinarian.** Zach is a student working at a veterinarian's office. His friend comes to visit him and sees cookies shaped like bones laying out in the worker's lounge. His friend asks if he can eat one.

One of Zach's coworkers had baked the cookies for her birthday and had put them out for others to enjoy. They are delicious and safe to eat.

One of Zach's coworkers had put the cookies in the lounge by accident. They are used to put dogs to sleep, so they are poisonous to eat.

Zach believes that the cookies are safe to eat because they are out in the workers' lounge, where people normally put food to share.

Zach believes that the cookies are poisonous because they are the shape of the cookies the veterinarian uses with special chemicals to put dogs to sleep.

Zach invites his friend to eat a dog bone-shaped cookie. His friend enjoys the cookie and asks for a second one.

Zach invites his friend to eat a dog bone-shaped cookie. His friend breaks into a sweat after several bites and stops breathing.

Inviting his friend to eat the cookie was:

**Chairlift.** Zoe is on winter break. She is running a chairlift at a ski lodge. She has just taken over after lunch break and is starting her afternoon shift. The first passenger is a child.

This afternoon, the chairlift is functioning perfectly normally and can safely carry passengers of any size up the side of the ski slope.

This afternoon, a problem with the electricity is making the old chairs bounce violently, making the chairlift dangerous for small passengers.

Zoe believes that the chairlift is in good condition and is safe for anyone to ride, as usual. She saw her coworker send a group of children off on the chairlift before lunch.

Zoe believes that the chairlift is in bad condition and is unsafe for children in particular because her supervisor told her that it was malfunctioning before lunch.

Zoe starts the chairlift, and the child gets on. The child has a safe ride to the top of the ski slope, skis down the hill, and returns to the chairlift again and again.

Zoe starts the chairlift, and the child gets on. About half way through the ride the chairlift makes a massive jolt and sends the child falling 100 ft to her death.

Letting the child on the chairlift was:

**Safety Town.** Sam is babysitting a preschool boy. His job is to watch the boy at Safety Town, a class designed to help children know what to do in a fire. Today, the children will go into a fake house full of smoke.

The boy has very strong lungs and is also used to second-hand smoke, so he will be comfortable going into the Safety Town smoking house.

The boy has asthma, which makes his lungs close up around smoke, so he will not be able to breathe if he goes into the Safety Town smoking house.

Sam believes that the boy is familiar with smoky environments, because both of the boy's parents are smokers. So, Sam thinks the boy should be just fine participating at Safety Town.

Sam believes that the boy has a bad reaction to smoky environments, because the boy's parents told Sam that he has asthma. So, Sam thinks that it is dangerous for the boy to participate at Safety Town.

Sam watches the boy go into the Safety Town smoking house. The boy comes out smiling because he has learned what to do in case of a fire.

Sam watches the boy go into the Safety Town smoking house. The boy has a severe asthma attack inside and starts having a seizure.

Letting the boy go into the smoke was:

**Malaria Pond.** Peter is traveling in Africa with a friend. His friend sees a pond and wants to go wading in it because it is very hot. His friend begins to walk toward the pond.

The pond is a good place for tourists. It does not contain any disease-carrying organisms. The water is unusually clean, so it is safe to wade in.

Malarial mosquitoes actually live in the pond. A single bite is enough to create an infection, so the pond is unsafe to wade in.

Peter believes that it is safe to wade in the pond, because other tourists around them are doing it too and are obviously having fun.

Peter believes that it is unsafe to wade in the pond, because Africa is known for malarial mosquitoes, and mosquitoes congregate around water.

Peter encourages his friend to wade in the pond. His friend loves the cool water and has a great time splashing around.

Peter encourages his friend to wade in the pond. His friend is bitten by several mosquitoes and contracts malaria.

Encouraging his friend to wade in the pond was:

**Hunt.** Mike and his friend are hunting a stag in the woods on Mike's property. They see something brown moving ahead of them. Mike's friend raises his gun, about to shoot.

The thing moving ahead of them is the large wounded stag. It is already close to death. Shooting it would be the culmination of the hunt.

The thing moving ahead of them is a trespassing hunter on Mike's property who does not see them. One shot might kill the trespasser.

Because Mike is hunting on his own property and recognizes the shade of brown he sees, Mike believes that they are looking at the stag they have been chasing. He believes that one good shot will complete the hunt.

Because Mike had just seen a man in a brown coat pass by them, he suspects that the moving brown thing they are looking at is actually a person. He believes that if his friend shoots, he might injure the stranger.

Mike does not stop his friend from shooting. They walk over and bring home the stag they have just shot.

Mike does not stop his friend from shooting. They walk over and find that they have shot a man in the head.

Not stopping his friend from shooting was:

**Spinach.** Will is grocery shopping for his grandmother, who adores spinach. Recently, there had been incidents of *Escherichia coli* contamination of bagged spinach, leading to a recall of all bagged spinach.

Bagged spinach has been restocked at many markets. It is 100% safe to eat and no longer contaminated with *E. coli*.

Bagged spinach has been restocked at many markets. However, some inspections are not thorough, and contaminated batches are still being missed.

At the market, Will sees that bagged spinach is being carried again. He believes that it is perfectly safe now because of some official-looking information by the spinach.

At the market, Will sees that bagged spinach is being carried again. He believes that bagged spinach may still be contaminated because of an incident just that day in his town.

Will buys his grandmother bagged spinach. His grandmother cooks some for dinner that evening. The meal is healthy and delicious.

Will buys his grandmother bagged spinach. His grandmother cooks some for dinner that evening and ends up in the hospital, violently ill.

Buying his grandmother spinach was:

**Peanut Allergy.** Susan teaches first grade. She is reviewing the student health forms to see who has food allergies, so she can assign classrooms appropriately. One of the students is missing a form.

The student used to have a peanut allergy but has outgrown it. So, now, she is completely fine being around peanuts and even eating food that contains peanuts.

The student did not use to have a peanut allergy but has developed a severe one. So, now, even when she is in a room in which someone is eating peanuts, she goes into shock.

Susan calls the student's home to find out whether she has any allergies and talks to the student's brother. Susan believes that the student is allergy-free.

Susan calls the student's home to find out whether she has any allergies and talks to the student's brother. Susan believes that the student is allergic to peanuts.

Susan puts the student in the classroom for people with no food allergies. The student sits next to someone eating a peanut butter sandwich and is totally fine.

Susan puts the student in the classroom for people with no food allergies. The student sits next to someone eating a peanut butter sandwich and soon is gasping for air.

Putting the student in that classroom was:

**Alarm.** Bill is house-sitting for some neighbors over the Columbus Day weekend. He is stepping out the door, late for a lunch meeting with a friend, when the fire alarm goes off.

The alarm is old and defective and goes off for no reason during the day but does turn off by itself after several minutes. The alarm needs to be replaced.

The alarm is very accurate and detects dangerous levels of heat. The alarm was purchased to prevent fires caused by overheating in the basement.

Bill remembers the neighbors' saying something about their alarm. He believes that the alarm is faulty and goes off randomly but will turn off by itself after 5–10 min.

Bill remembers the neighbors' saying something about their alarm. He believes that the alarm goes off when their old heating system in the basement dangerously overheats.

Bill leaves the house to meet his friend. While he is gone, the alarm turns itself off and does not act up again all weekend.

Bill leaves the house to meet his friend. While he is gone, the alarm keeps sounding and a fire starts in the basement of the house.

Leaving the house to meet his friend was:

**Safety Cord.** Kristin works at a rock-climbing shop. She is unpacking some equipment when a customer walks in, looking for a safety cord.

The safety cords from the new company are incredibly well made. They come with a lifetime guarantee and work very well for expert rock-climbers.

The safety cords from the new company are about to be recalled. They will not hold anyone who is rock-climbing for longer than 20 min.

Kristin sees that the equipment is from a new company that a rock-climbing friend of hers finds really reliable. So, Kristin believes that their safety cords are solid.

Kristin sees that the equipment is from a new company that a rock-climbing friend of hers finds really unreliable. So, Kristin believes that their safety cords are untrustworthy.

Kristin sells the customer one of the new safety cords. The safety cord serves the customer well on his next rock-climbing expedition. The customer is very pleased.

Kristin sells the customer one of the new safety cords. The safety cord snaps during the customer's next rock-climbing expedition. The customer falls 50 m.

Selling the customer the new safety cord was:

**Zoo.** Ryan is at the zoo with his nephew. They are watching the dolphin show when the nephew complains that his stomach hurts.

Ryan's nephew is really fine. His stomach sometimes hurts when he eats too much junk food, as on that day, but he usually feels a lot better after an hour or so.

Ryan's nephew is really sick. After his recent operation, his doctors had warned that stomach pain could indicate really serious complications.

Ryan believes that his nephew's stomach hurts because he ate too much cotton candy and fried dough that afternoon. Ryan thinks his nephew just needs to walk it off.

Ryan believes that his nephew's stomach hurts because of a major operation he had several weeks ago. Ryan thinks that his nephew needs medical attention immediately.

Ryan takes his nephew to see the monkeys next. His nephew starts feeling better in no time. They end up seeing nearly all the exhibits at the zoo.

Ryan takes his nephew to see the monkeys next. His nephew starts feeling worse and soon blacks out because of severe internal bleeding.

Not responding to his nephew's stomachache was:

**Bar.** Kevin is at a bar one night when he sees his sister sitting at the next table. His sister is laughing and drinking and seems to be having a good time.

Kevin's sister is drinking her first drink and does not plan to drink anything else that night so that she can drive herself home safely.

Kevin's sister is drinking her fifth drink and plans on driving herself home even though she is drunk and will be dangerous on the road.

Kevin's sister is very responsible, so Kevin believes that his sister will be sure to stay sober enough to drive herself home safely.

Kevin's sister loves to party hard, so Kevin believes that his sister is drunk, as usual, and will be in no shape at all to drive herself home.

Kevin pays his bill and leaves the bar without talking to his sister. His sister decides to leave soon after. She drives herself home safely and goes to right to bed.

Kevin pays his bill and leaves the bar without talking to his sister. His sister decides to leave soon after. She drives into a concrete divide and snaps her spine.

Leaving the bar without talking to his sister was:

**Sushi.** Mitch and his colleagues are at a new sushi restaurant close to their office. Mitch happens to know the owner of the restaurant through a mutual friend.

The restaurant owner takes great care to ensure the freshness of all the fish prepared sushi-style. Everything exceeds health standards. The tuna is a specialty.

The restaurant owner has purchased some of his fish at cheap but disreputable fish markets to save money. Some batches of fish, usually the tuna, have parasites.

Mitch believes the tuna is especially excellent, after hearing his friend rave about it. Mitch thinks anyone who likes tuna should order the tuna here.

Mitch believes that the tuna is not very fresh after hearing his friend complain about it. Mitch thinks everyone should avoid the tuna in case of parasites.

Mitch recommends the tuna to his colleagues at the table. One of his colleagues orders the tuna and ends up finding it quite good.

Mitch recommends the tuna to his colleagues at the table. One of his colleagues orders the tuna and ends up getting a nasty strain of parasites.

Recommending the tuna to his colleagues was:

**Cayo.** Haley and her assistant are studying primate cognition on an island off Puerto Rico. The monkeys there roam around freely. The assistant is in charge of handling the monkeys.

The monkeys carry some diseases that can be transmitted to birds, but they do not carry any diseases that could be transmitted to humans.

The monkeys carry some rare and deadly diseases that can be transmitted to humans by bites or even minor scratches.

Haley talks to the knowledgeable natives on the island at length about the monkeys. She believes that the monkeys are free of diseases that may be dangerous to humans.

Haley talks to the knowledgeable natives on the island at length about the monkeys. She believes that the monkeys carry many diseases that may be dangerous to humans.

Haley tells her research assistant to not bother with protective gear. Her research assistant takes her advice. She leaves the island totally healthy and disease-free a month later.

Haley tells her research assistant to not bother with protective gear. Her research assistant takes her advice. She gets scratched by a monkey and contracts a deadly strain of herpes.

Telling her research assistant to not bother with protective gear was:

**Fumigation.** Brian is helping out his neighbor for the weekend. His neighbor is away, but her house is getting fumigated (with poisonous fumes) because of pests.

The neighbor's Great Aunt Sally is at her bridge partner's house. She will not be back until late afternoon of the following day when the house is free of noxious fumes.

The neighbor's Great Aunt Sally is upstairs in her attic room. She has fallen fast asleep and will not wake up easily, even when the fumigators start pumping in the fumes.

When Brian lets the fumigators in, he believes that his neighbor's Great Aunt Sally has gone to stay with her bridge partner, as she had planned on doing that earlier in the day.

When Brian lets the fumigators in, he believes that his neighbor's Great Aunt Sally is still upstairs in her attic room, taking a nap before going over to her bridge partner's.

Brian tells the fumigators to start their job. They fill the house with poisonous gas, which gets rid of the pests. The neighbor's Great Aunt Sally returns the next day to a pest- and fume-free house.

Brian tells the fumigators to start their job. They fill the house with poisonous gas, which gets rid of the pests. The neighbor's Great Aunt Sally dies inhaling poisonous fumes while sleeping.

Telling the fumigators to start their job was:

**Porridge.** Eva is babysitting her baby niece and 7-year-old nephew. The older boy likes playing tricks on people. The little girl is happy as long as she gets her porridge.

The porridge on the counter is fine and nutritious, and even tastes good. Eva's nephew is keeping himself busy in the yard. He is chasing the dog around in circles.

The porridge on the counter has some dishwashing detergent in it. Eva's nephew spilled a large amount of detergent into the container while he was playing.

Eva gets her niece's porridge from the counter. She believes it is the porridge, because there is a note next to it saying "porridge for baby Emily."

Eva gets her niece's porridge from the counter. She believes that there is something wrong with it because it has a strange and suspicious smell.

Eva spoon-feeds her niece the porridge. Her niece eats it up. Satisfied, she takes a long nap in the afternoon and wakes up wanting even more porridge.

Eva spoon-feeds her niece the porridge. Her niece eats it up. Soon after, she starts throwing up again and again and ends up in the emergency room.

Feeding her niece the porridge was:

**Bouncy Ball.** Nicole and her cousin are playing with a bouncy ball in front of Nicole's house. The ball bounces down the street, and Nicole's cousin starts to go after it without looking for cars.

The street is totally empty except for some other children playing, so it is fine for Nicole's cousin to go out and get the ball.

There are many cars coming around the corner and down the street fast, so it is unsafe for Nicole's cousin to go out and get the ball.

Because it is very early in the morning, Nicole believes no cars will be coming down the street, making it safe for her cousin to run and get the ball.

Because it is rush hour, Nicole believes many cars will be coming down the street, making it dangerous for her cousin to run and get the ball.

Nicole waves to her cousin to get the ball. Her cousin reclaims her ball, and they continue playing.

Nicole waves to her cousin to get the ball. Her cousin runs out to the street and gets hit by a speeding car.

Waving to her cousin to get the ball was:

**Parachutes.** Maggie is a new employee at a small sky diving company. Her first customer weighs 200 lb. She has just opened a new batch of parachutes.

The parachutes are very strong and well made. They will last a lifetime and can be used safely by anyone of any weight.

The parachutes are faulty and should be discarded immediately. They will not be able to support anyone heavier than 100 lb.

After receiving assurances from her supervisor, Maggie believes that the new parachutes are well made and can bring all her customers to a safe landing.

After receiving warnings from her supervisor, Maggie believes that the new parachutes are faulty and cannot bring anyone over 100 lb to a safe landing.

Maggie gives the 200-lb customer a new parachute. He uses the parachute, and it successfully slows his fall. He enjoys a perfect landing.

Maggie gives the 200-lb customer a new parachute. He uses the parachute, and it cannot hold his weight. He hits the ground way too fast and dies.

Giving her customer a new parachute was:

**Rabies.** Chloe works at the pound. Several new dogs have just come in. A lady comes in, interested in taking one of the new dogs home with her.

The dogs are very healthy and active and will make great pets for anyone who loves dogs.

The dogs are very sick with rabies and will make their owners sick too by biting them.

Chloe talks with one of the other people at the pound. Chloe believes that the new dogs have been through a thorough health inspection and will make good pets.

Chloe talks with one of the other people at the pound. Chloe believes that the new dogs all failed their health inspection and are infected with rabies.

Chloe gives the lady one of the new dogs. It is in perfect health, and the lady bonds immediately with her new pet.

Chloe gives the lady one of the new dogs. It is infected with rabies and bites the lady on the neck on the very first day.

Selling the dog was:

**Fraternity.** Charles is at a fraternity party, where people are drinking lots of beer. He is having fun mingling when he notices a friend on a couch with his eyes closed.

Charles's friend did not drink but had felt exhausted during the party. He is taking a quick nap on the couch now.

Charles' friend had just failed his examinations and was drinking heavily to take his mind off them. He has passed out now.

Charles believes that his friend is asleep because he had needed some rest after studying hard for his midterm examinations.

Charles believes that his friend drank too much and is now in a coma because he had failed too many of his midterm examinations.

Charles does not try to wake his friend. His friend wakes up after 15 min and rejoins the party, refreshed.

Charles does not try to wake his friend. His friend enters into a coma and has to be taken to the hospital, where he never wakes up. Not waking his friend was:

**Tree House.** Joshua finds an abandoned tree house in the woods. He takes a younger buddy there to show him his great discovery.

The tree house is new and has been built with thick heavy wood, so it makes a very safe and fun hangout spot for boys.

The tree house is old and built with now rotting wood, so it is incredibly dangerous to even set foot in.

Because of its newly built appearance, Joshua believes that the tree house is sturdy and that it will be a safe place for them to play.

Because of its old dingy appearance, Joshua believes that the tree house is weak and that it will be an unsafe place for them to play.

Joshua invites his buddy to climb into the tree house. His buddy jumps around and has a great time up in the air.

Joshua invites his buddy to climb into the tree house. His buddy breaks both his legs after falling through broken floorboards.

Inviting his buddy to climb into the tree house was:

**Spring Break.** Janelle is on spring break in Hawaii with her boyfriend. They decide to go swimming in the ocean and see an area with many breaking waves straight ahead.

The breaking waves are caused by a sandbar. The sandbar results in calm shallow water safe and fun for swimming.

The breaking waves are caused by dangerous currents. The currents result in a large undertow that has killed many strong swimmers.

Remembering the waves at a sandbar by her cottage, Janelle believes that the breaking waves indicate a sandbar and that it would be an enjoyable place to swim.

Remembering the recent warnings of her scuba instructor, Janelle believes that the breaking waves indicate an undertow and that it would be a dangerous place to swim.

Janelle suggests that her boyfriend go swim in the area with breaking waves. Her boyfriend swims out and has a great time.

Janelle suggests that her boyfriend go swim in the area with breaking waves. Her boyfriend swims out and drowns in the undertow.

Suggesting that her boyfriend go for a swim was:

**CPR.** Steven is at a restaurant that just opened in his neighborhood. He sees another customer at the table next to his begin to cough. The customer is sitting alone, and there are no wait staff nearby.

The customer has just eaten a very hot chili pepper in his taco. He will be fine after drinking something to wash down the spice.

The customer did not chew his meat carefully enough and is choking on it. He needs someone to perform the Heimlich maneuver on him.

Because they are at a Mexican restaurant, Steven believes that the customer just ate something very spicy and needs to drink some water.

Because he has just finished CPR training, Steven believes that the customer is choking on a piece of food and needs help immediately.

Steven sits quietly and continues eating his meal. The customer chokes to death at the table.

Steven sits quietly and continues eating his meal. The customer has a glass of water and is fine.

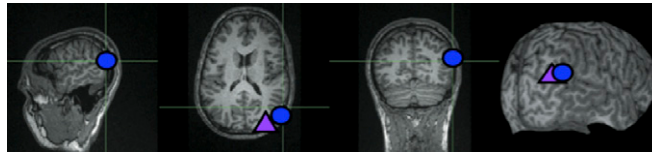
Sitting quietly and continuing to eat his own meal was:

**Mother.** Bob is reading the newspaper on his front porch. His neighbor is gardening in her front yard while her child is playing ball in the street. A car is driving up the street.

Bob's neighbor has an eye on her child. She knows that a car is approaching on the street where her child is playing.







**Fig. S2.** Results from a single subject on the functional localizer task. The subject-specific functional RTPJ (blue circle) and the active control region 5-cm posterior (purple triangle) are displayed on structural MRI in the three radiological planes. (*Right*) 3D reconstruction was also used for easier visualization, but information from the three radiological planes was used for more accurate targeting and monitoring.