Supplementary Material

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Scenarios

Stories were presented in cumulative segments:
(1) Background (6 seconds)
(2) Action (4 seconds)
(3) Outcome (4 seconds)
(4) Intent (4 seconds): accidental versus intentional (both are presented here)

Harmful Acts - Physical

You are about to leave your friend's house when the carbon monoxide detector sounds. You check the back of the detector to see what might be going on.
You take a look, turn off the detector, and leave the house.
The detector detects dangerous levels of carbon monoxide in your friend's house.
From the back of the detector, you thought the detector just needed new batteries.
From the back of the detector, you knew that the detector was working properly.

You are house-sitting for a neighbor when pest control arrives. All people and pets must evacuate before fumigation begins, or else they will get very sick from the gases.
You leave and tell pest control they can begin fumigating.
The neighbor's dog is still in the house when the gases start getting pumped in.
From the sound of barking, you thought your neighbor's dog was safe in the backyard.
From the sound of barking, you knew your neighbor's dog was still inside the house.

You are teaching a kids' fire safety class. In the class, kids learn how to deal with real smoke in case of a fire. You decide who should participate.
You decide everyone must participate and begin to teach the class.
A boy in the class has asthma and cannot participate without risk of an asthma attack.
From the health forms, you did not realize this boy has asthma.
From the health forms, you fully realized that this boy has asthma.

You are a new employee at a sky diving company. A customer is looking to buy one of the store's parachutes. You consult with your manager first.
You sell the customer one of the parachutes. He plans to try it out tomorrow.
The chute failed in-house quality control and should have been tossed.
Based on what the manager said, you did not realize at all the chute was faulty.
Based on what the manager said, you definitely realized the chute was faulty.

You are traveling with your cousin. Your cousin is hot and wants to go swimming in the pond ahead. You look up information on the pond in your travel guide.
You tell your cousin it's safe to go swimming. He eagerly jumps in.
The pond actually contains chemical pollution and is not safe for swimming.
Because of what the guide book said, you did not realize the pond was unsafe.
Because of what the guide book said, you realized the pond was unsafe.

You are grocery shopping for your grandmother. Bagged spinach had recently been recalled for E. coli contamination, but some markets have begun carrying it again.
You buy spinach for your grandmother. You use it to make her a large salad.
The spinach is contaminated with E. coli and will make your grandmother very sick.

You had checked online and did not realize the spinach at your market was contaminated.
You had checked online, so you realized the spinach at your market was contaminated.

Your classmate wants to borrow your bike to go mountain biking. Your bike's brakes had not been working properly. Your bike has just come back from the repair shop.
You lend your classmate your bike, and he leaves the next day for a bike trip.
The brakes are still not working, and the bike is unsafe to ride.
After talking to the folks at the repair shop, you thought the brakes were fully fixed.
After talking to the folks at the repair shop, you knew the brakes were still broken.

You are at a Mexican restaurant. It is a slow day. There are no waiters nearby and only one other customer. This customer is sitting at the next table, and he starts coughing loudly.
You ignore the man's coughing and continue eating your meal.
He is actually choking on a piece of food and needs help.
Judging from the man's expression, you can't tell at all that he's choking on food.
Judging from the man's expression, you can absolutely tell he's choking on his food.

You and a friend are in a two person kayak in the ocean. The sun is beating down on you, and it would be cool and refreshing to take a swim in the surrounding water.
You tell your friend to jump in for a swim while you man the boat.
There are lots of jellyfish in the water that deliver painful stings to swimmers.
You looked and did not see any jellyfish in the water at any point along your ride.
You looked and actually saw jellyfish in the water at many points along your ride.

You and your friend are in the park roller-skating. You skate ahead and sit down behind a tree. You try to get comfortable, but there is a large stick in your way.
You toss the stick aside to make yourself comfortable, and it lands on the park path.
Your friend skates over the stick, and breaks his ankle.
You could not see that your friend was about to skate by, so you tossed the stick.
You saw that your friend was about to skate by, and you still tossed the stick.

You are at lunch during school. A classmate approaches you and asks you to show him some moves you learned recently in your martial arts class.
You tell him to stand back. You get ready and perform the martial arts kick.
Your classmate is standing too close, and you end up kicking him in the face.
You could not see that your classmate was standing too close, so you kicked.
You could see that your classmate was standing too close, but you kicked anyway.

Your family is over for dinner. You're taking cooking classes and wish to show off your culinary skills.
For one of the dishes, adding peanuts will really bring out the flavor.
You grind up some peanuts, add them to that dish, and serve everyone.
Your cousin, one of your dinner guests, is severely allergic to peanuts.
You had absolutely no idea about your cousin's allergy when you added the peanuts.
You knew about your cousin's peanut allergy when you added the peanuts to the dish.

Harmful Acts - Psychological

You are at a dinner party with friends when there is a lull in the conversation. You just heard a joke about a boy and his puppy that could liven things up.
You have everyone's attention, so you proceed to tell the joke.

Your friend's puppy was just hit by a car, and she is very upset by your joke.
You did not hear your friend's puppy died until after you told the joke.
You had just heard your friend's puppy died before you told the joke.

You and another classmate are about to give a formal presentation to many important faculty members.
Your classmate is especially anxious about making a good impression.
The two of you take a deep breath and begin the presentation.
Someone in the audience points to your classmate's open fly, mortifying him.
You did not notice his open fly before that and could not have warned him.
You did notice his open fly before the presentation and could have warned him.

Your friend is a marine and was recently shipped to Iraq. You are watching the news when his name comes up as someone who has died in a recent bombing.
You rush over to your friend's parents to say you're sorry about their son's death.
The young man who died is not actually their son, just someone with the same name.
On the news, there had been no picture with the name, so you didn't realize it wasn't him.
On the news, there had been a picture with the name, so you realized it was not him.

Your sister is babysitting, and you go visit to go over to see what's up. When you get to the house, you find the baby but not your sister, who is in the basement fixing the fuse.
You take the baby home with you without telling your sister.
When your sister cannot find the baby, she panics and calls .
You thought your sister left, and you were doing her a favor by taking the baby.
You knew your sister had not left, and that she would panic if you took the baby.

You are sitting in math class on the first day of high school. As an introduction, the teacher asks everyone in class for an entertaining anecdote or a joke.
You decide to tell a joke. It is a joke about an elf and a midget.
A new student in your class happens to be a midget. He is hurt by your joke.
This student's sitting far behind you. You didn't realize he was in your class.
This student's sitting right in front of you. You realized he was in your class.

You are sitting in class without much to do. You notice a note of some kind sitting on the floor next to your desk.
You show the note to the girl behind you.
It is a poem written by your close friend about this girl, his secret crush.
The poem was not signed, so you really did not think your friend wrote it.
The poem is in your friend's writing, so you knew your friend wrote it.

You are taking a class on Shakespeare. On the very first day, the teacher asks for volunteers to deliver a monologue in front of the class.
You volunteer a classmate who is in the bathroom at the time.
When she returns, she has to perform for everyone. She is terrified of public speaking.
You just met this classmate and did not realize she has this fear.
You know this classmate from before and realized she has this fear.

You are in English class, prepping for the AP test at the end of the year. Your teacher passes out a sample essay that you are to discuss openly and honestly.
You suggest the essay must have been written by a third-grader.
The student who wrote the essay is in your class listening to your critique.

The essay was typed, so you completely didn't realize who had written it.
The essay was handwritten, so you realized right away who had written it.

You are at an ice skating rink with a large group of friends. One of your friends shows up in an ugly, frumpy looking sweater that his grandmother gave to him.
You make a joke about how his grandmother has terrible taste in sweaters.
His grandmother died very recently, and he is still very sad.
You hadn't heard anything about his grandmother passing away.
You had heard from someone that his grandmother passed away.

It's your little brother's birthday, and you are in charge of the surprise birthday party. You make your brother's party circus themed.
You dress up like a clown and jump out yelling 'Surprise' when he arrives.
Your little brother has an extreme phobia of clowns. He starts shaking.
You had never been to the circus with him and didn't know about his phobia.
You had been to the circus with him before, and so you knew about this phobia.

You are giving a PowerPoint presentation for your Psychology class. Your laptop is not compatible with the classroom equipment needed to display your presentation.
You announce that you're borrowing the laptop of a classmate who is in the bathroom.
When you hook it up, pornography pops up on his computer. The whole class sees.
You didn't see that a porn site was open because the browser was hidden.
You saw that a porn site was open because the browser was in front.

You receive an email from a distant acquaintance in your dorm. The email says she is committing suicide tomorrow. She says it is a secret.
You cannot bear this burden alone.
You forward her entire email out to everyone in your dorm.
You think you're forwarding her email to the school psychiatrist only.
You know that everyone in your dorm will read her private email.

Impure Acts

You are walking your dog in the local park, and you see someone walking a dog of the same breed. The two of you strike up a conversation about dog walking.
After the third date, you decide to go home and sleep together.
The two of you are related by blood. You are half siblings.
You do not discover this until the next date after you'd already slept together.
You discovered this on the second date before you'd actually slept together.

You are on vacation by yourself in a national park, hiking and camping. After a day or so, you run into someone who happens to be from the same city as you.
A day later, you decide to have sex in your tent, using two forms of birth control to be safe.
The person you have sex with in your tent is your first cousin.
You didn't realize you're first cousins, as you're from estranged parts of the family.
You came to realize you're first cousins, as soon as soon as you met and started talking.

You are on a singles' cruise. On the first day you decide you've met your soulmate. Luckily, this person agrees, and you decide to move in together after the cruise.
After the trip, the two of you finally consummate your relationship on a waterbed.

You and this person you say is your soulmate are long lost twins.
You didn't know this until after you had sex, in talking about family drama.
You knew about this well before you had sex, in talking about family drama.

You are at the library doing some research for work. You end up chatting with a younger, attractive person who happens to be reading the novel that you are reading.
A coffee date and two dinner dates later, you end up in bed with this person.
It turns out that this person is the child you gave up for adoption decades ago.
In conversation, after that night, you find out this person is your child.
In conversation, before that night, you found out this person is your child.

You recently started chatting with someone in an online chat community. You live on opposite coasts, but you have been chatting nightly for weeks now.
You engage in cyber sex. For this, both of you pleasure yourselves on the computer camera.
Your cyber sex partner is your older sibling.
The camera shots were of the body only, so you didn't know it was your sibling.
The camera shots were of the body and face, so you knew it was your sibling.

You and your co-workers are at a strip club. Some of the dancers are wearing masks. Your co-workers buy you a dance, where you and the dancer go to a private booth.
The dancer is about to get fully undressed. You are very aroused by the dancer.
The dancer is your own child from your former marriage.
The dancer was wearing a mask, so you could not see that it's your own child.
The dancer had taken off the mask, so you could see that it's your own child.

You are at a dorm party, and you have a good time with someone there. This person feels the same way about you, like you've known each other forever.
At the end of the night, you decide to have sex, using a condom and a dental dam.
You two are actually long lost siblings.
The next day, you discover that you're siblings when you talk about family.
Earlier that night, you discovered you're siblings in talking about family.

You were separated from your fraternal twin at birth. You two have never met each other. Years later, you are on a blind date. Your friends at work set you two up.
After a stimulating date, you have sex in the cab ride back.
This person is actually your fraternal twin.
You didn't talk about your shared past until after, so you didn't know.
You talked a lot about your shared past at dinner, so you definitely knew.

You were adopted at birth and have never met either of your parents. At your college reunion, you go to your school's football game and meet someone a bit older.
That night, you two end up sneaking back into the stadium and having sex on the field.
The person you have sex with is actually your biological parent.
You did not know this was your parent, because you had never met.
You knew this was your parent, because you kept a photo with you.

You are interested in getting some minor plastic surgery and go to a clinic your aunt suggested. The receptionist who greets you is extremely attractive.
You end up having sex with the receptionist in one of the medical exam rooms.
The person you have sex with is your aunt's child, your own cousin.

Your cousin has had multiple plastic surgeries, so you did not recognize your cousin.
Your cousin has had multiple plastic surgeries, but you still recognized your cousin.

You at a family reunion. You find many members of your family to be very boring, but then you meet someone you have never seen before. The two of you start talking.
That night, you two sleep together, making sure to use birth control.
The two of you live on different continents, but you are first cousins.
You couldn't tell this person's related to you, and not just a family friend.
You could tell this person's directly related to you, not just a family friend.

You have been out of touch with your brother for nearly twenty years and finally decide to reunite. You go to his house, but he's out. Someone else answers the door.
The two of you instantly hit it off and have sex in the kitchen before your brother returns.
This person happens to be your brother's adult child.
You thought that this person was just a house sitter, not related to you.
You knew this person was your brother's child, not just a house sitter.

You are at a friend's party. People are chatting outside on the patio where you left your drink. Later in the night, you find that you are extremely thirsty.
You go out to the patio, find your drink, and drink the whole thing.
Your drink contains a fair amount of someone's urine.
You did not realize that someone peed in your drink, so you finished it.
You realized that someone peed in your drink, but you finished it anyway.

You are in your garden planting when you decide to get a drink inside. Meanwhile, a dog wanders by where you were sitting. You go back outside to continue planting.
You scoop up a pile of dirt with your bare hands, getting some on your face.
The dirt pile is actually a pile of wet steaming poop left behind by the dog.
You didn't see the dog poop, so you continued without gloves.
You saw the dog poop, but you continued anyway without gloves.

You are at your neighbors' house with a glass of tomato juice when their vampire-obsessed -year-old daughter enters the kitchen. She starts talking about vampires.
You take your tomato juice to drink and finish it in a few gulps.
What you drank was half juice half human blood that this girl poured in.
You weren't looking when she poured the blood, so you drank your juice.
You were looking when she poured in the blood, but you drank it anyway.

You're preparing dinner for yourself, and decide to make rice pilaf. The last time you put the rice in the cupboard nearly a month ago, you left the container open.
You scoop up a large cup of rice, cook it, and eat all of it for dinner.
Your rice is infested with maggots, which you end up cooking and eating.
You didn't see the maggots when you scooped up the rice, so you had it for dinner.
You saw the maggots when you scooped up the rice but decided not to waste food.

You are having a picnic at the beach with friends. One of your friends is already very sunburnt and has been compulsively peeling flakes of skin off his body all day.
You and your friends decide to go swim for a while. When you come back, you eat your food.
While you were swimming, a breeze blew all the skin flakes onto your potato salad.
You didn't realize your potato salad was covered in skin flakes, so you ate it.

You realized your potato salad was covered in skin flakes, but you ate it anyway.

You are working at a free health care clinic. While you are sitting, somebody walking by spills iced coffee on your head. You look for something to wipe off your face and neck.
You find a cloth on the table and wipe off your entire face and neck.
The cloth is actually a used bandage covered in dried body fluids.
You did not know that the cloth was a used bandage, so you used it.
You knew that the cloth was a used bandage, but you used it anyway.

You are eating lunch at a new fast food restaurant. You decide to try the new 'super burger' on the menu.
You're starving by the time the burger is in your hands.
You scarf down the whole burger along with your soda and fries.
The burger actually contains the tail of a tiny dead mouse that got cooked into your burger.
You did not see the tiny mouse tail at any point, so you finished your meal.
You saw a tiny mouse tail halfway through your meal but continued eating.

A car just killed your beloved dog. You had your dog for many years. Later, to cheer yourself up, you decide to cook dinner for yourself and your quirky housemate.
You take meat out of the freezer, chop it into smaller cubes and make stew for dinner.
The meat was from your dead dog. Your housemate had prepared and frozen it before it spoiled.
The meat was labeled 'beef' so you did not realize you were eating your dog.
The meat was labeled 'dog', so you did realize that you were eating your dog.

You are waiting to brush your teeth while your friend is in the bathroom. When she leaves, you go in.
There's an opened pregnancy test on the counter by the sink.
You finish brushing your teeth and use a cup on the counter to rinse out your mouth.
Your friend just peed in that cup for her pregnancy test.
Your friend forgot to tell you she peed in that cup, so you thought it was just mouthwash.
Your friend told you she peed in that cup, so you knew it was urine, and not mouthwash.

Your roommate recently had liposuction around her stomach. She is now one week post operation. She is resting in the living room, when you return from the gym.
You go to take a shower. You've just run out of your favorite body wash, so you decide to use soap.
The soap you used to clean your body was made from your roommate's stomach fat.
The soap was labeled 'Dove', so you had no idea it was actually stomach fat soap.
The soap was labeled 'Fat', so you knew it was your roommate's stomach fat soap.

Your grandpa is in bed with a terrible cough. You decide to bring over a large container of soup for the two of you. You go to the kitchen to get two bowls and silverware.
You divide the soup up into two bowls and finish all of your serving.
When you were in the kitchen, your grandpa tipped a container of his phlegm into the soup.
You had no idea your grandpa spilled his phlegm because he didn't say anything.
You knew your grandpa spilled his phlegm because the container had tipped over.

You are at your uncle's house. Your uncle is somewhat mentally unstable. He collects many strange small objects. You decide to make yourself some coffee and go to the kitchen.
You grind some coffee beans from a container, and brew some coffee.
The container contained your uncle's toenail clippings that you ground up with the beans.
The clippings were at the bottom, so you did not see anything wrong with the coffee.
The clippings were at the top, so you saw that something was wrong with the coffee.

Neutral Acts

You are taking a walk by the woods near your house when you run into a neighbor of yours, walking one big dog and one small dog. Your neighbor stops to say hi.
You say hi and bend down to pet your neighbor's dogs.
The big dog starts wagging its tail, but the small dog bears its teeth.
You didn't see that the big dog was friendlier than the small dog.
You saw that the big dog was friendlier than the small dog.

You are walking to your local supermarket. It has been raining, and the street is covered in large puddles. You see one in the path in front of you.
You go to jump over the puddle but don't make it, dunking your foot in the water.
Despite this, no water soaks through your shoe, and your foot remains dry.
You knew that your shoes were water resistant.
You didn't know that your shoes were water resistant.

You are a new employee at a popular clothes store in the mall. You go in for your first day of work and meet your first costumer. They are looking for a new shirt
The costumer tries on a few shirts but decides not to buy any of them.
The costumer leaves their shirts in the dressing room.
You realized this and refold the shirts to be put back.
You didn't realize this and refold the shirts at the end of the day.

You're out to dinner with some friends of yours. As the appetizers arrive, you ask whether anyone's seen any exciting movies or read any interesting books lately.
You tell your friends about a movie you rented last weekend.
Two of your friends saw this movie when it came out last year.
You did not realize this until after you started talking about it.
You realized they'd seen it because they told you a while back.

You are bored, and have started checking your friends' Facebook pages to see if there is any news.
You go to the page of a friend you haven't spoken to since high school.
His status has changed from "single" to "in a relationship"
You didn't hear that he was in a relationship.
You already heard that he was in a relationship.

You and a friend are about to give a big presentation in class. You both have been working on it for many weeks and are completely prepared.
You two show up for class and give the presentation.
The teacher enjoys it, especially the graphs you included.
You knew the teacher would enjoy the graphs.
You did not know the teacher would enjoy the graphs.

You and your partner are on a week-long vacation together. For the first time in a while, you're totally relaxed and not tied to your computer or Blackberry.
You spend much of the week in the hotel room, sleeping or having sex.
This is your first vacation since your honeymoon two years ago.
You didn't realize how much you needed a vacation.
You realized just how much you needed a vacation.

You are at work when you on break for lunch. You have finished eating, and are making a quick run to the bank to deposit this week's paycheck.
You go into the bank, and get in line for one of the tellers.
You chose this line because you are attracted to the bank teller.
You could tell that the bank teller also finds you attractive.
You couldn't tell that the bank teller also finds you attractive.

You have just graduated college and have started working at your new job. You get along especially well with someone from the office next to you.
You decide to date, and after several months, decide to sleep together.
Several years later this person becomes your spouse.
When you first met, you knew that they could be your spouse one day.
When you first met, you never knew that they could be your spouse one day.

You are in charge of teaching third-graders reading and writing skills. You usually read to the children first and then have them write and read aloud their own stories.
For this class, you have everyone to write about food they ate recently.
Two people in the class write about how they ate potato salad.
This hadn't come up before, so you didn't know they'd eaten potato salad.
This came up before, so you knew these students had eaten potato salad.

You are taking a stroll in the park by your house along the bank of a stream. It is finally nice weather outside, and you are enjoying the fresh cool air.
Every once in a while, you pick up a stone and skip it across the water.
As you reach for a stone, a big toad suddenly hops from next to it into the water.
You did not see the toad before it hopped away.
You could see the toad before it hopped away.

You are very hungry and decide to go to your favorite fast-food restaurant for lunch. You look through the many choices on the menu and decide to get the chicken sandwich.
You get your food and hungrily eat the whole thing.
While you eat, you spill a little bit of ketchup on your pants.
You realize this when it happens and clean it off.
You don't realize until you finish eating, then you clean it off.

Theory of mind localizer task

The task consisted of 10 stories in each of two conditions: (1) stories requiring the inference of another person's mental states (e.g., false beliefs) and (2) stories requiring the inference of outdated (i.e., false) physical representations (e.g., outdated photographs). The entire set of stimuli can be found at: http://saxelab.mit.edu/superloc.php. Each story was presented on the screen for 10 s, followed by a true/false question about the story (4 s). An event was defined as the period between the start of the story presentation and the end of the question presentation (14 s). Beta values were estimated in each voxel for stories describing mental states (e.g., belief) or physical representations (e.g., photo). A contrast map was produced in each participant identifying voxels responding more to stories about mental states than stories about physical representations. ROIs (Table S1) were defined as all voxels in a 9-mm radius of the peak voxel that passed threshold in the contrast image belief > photo ($p < 0.001$, uncorrected; $k > 16$, a value computed via 1,000 iterations of a Monte Carlo simulation) (Slotnick, Moo, Segal, & Hart, 2003).

Table S1. Peak coordinates for regions of interest (ROIs) involved in theory of mind, separated by participant group

ROI	# of subjects	MNI coordinates			t value	# of voxels
		x	y	z		
NT						
rTPJ	24/25	54	-55	22	7.28	74
lTPJ	24/25	-51	-57	23	6.75	67
precuneus	25/25	2	-59	35	7.40	81
dmPFC	15/25	1	47	37	4.86	30
ASD						
rTPJ	15/16	52	-57	26	6.04	64
lTPJ	12/16	-52	-57	24	5.91	51
precuneus	16/16	0	-58	38	6.24	73
dmPFC	8/16	4	53	33	5.26	48

Whole-brain analyses: action component

In the main text, we took a conservative approach and modeled the entire duration of the trial. One question is whether activation differences for psychological and physical harm could be suppressed when incorporating components of the trial that did not present direct information about harm (e.g., background information). Thus, we modeled just the outcome, which is when information about harm is presented. When we examined just the outcome, we did not find any large differences at the whole-brain level (Table S2): as in the main text, we found large overlaps in activity for the *psychological harm > neutral act* contrast and the ToM network as elicited by the independent localizer task. Likewise, as in the main text, the overlap was a lot smaller for the *physical harm > neutral act* contrast; the only difference we saw was that the overlap was with the lTPJ and not the rTPJ as was found in the main text. Nevertheless, we want to emphasize that we overall get a similar pattern of results as in the main text (when the whole duration of the event is modeled).

We also directly compared physical and psychological harm (Table S3) as we did in the main text. The *psychological harm > physical harm* contrast revealed clusters with peak coordinates in the left superior medial gyrus, precuneus, bilateral middle temporal gyrus, and left angular gyrus; these regions overlapped with the precuneus, dmPFC, and bilateral TPJ as elicited by the ToM localizer. This pattern of results is consistent with what we found in the main text (when the whole duration of the event was modeled). The contrast *physical harm > psychological harm* revealed just one cluster: the right inferior parietal lobule. While this region was not observed with the analysis reported in the main text, this result echoes the lack of widespread recruitment of brain regions for physical harm vs. psychological harm observed in the main text.

Interestingly, no differences between the NT and ASD groups were observed here. This result contrasts with the one reported in the main text, which reveals greater recruitment of the ACC in the NT group vs. the ASD group with regard to the *psychological harm > physical harm* contrast.

Table S2. Results from modeling just the outcome component of the trial: regions showing greater activation in the NT group for psychological harm vs. neutral acts (top) and physical harm vs. neutral acts (bottom)

| Region name | MNI coordinates | | | *t* value | # of voxels |
	x	*y*	*z*		
Psychological > neutral: NT					
L middle temporal gyrus	**-63**	**-22**	**-14**	**8.90**	**368**
L middle temporal gyrus	-60	-10	-14	5.92	
L middle temporal gyrus	-63	-34	-8	5.89	
Precuneus	**0**	**-61**	**34**	**8.23**	**353**
Precuneus	0	-55	28	8.08	
L precuneus	-3	-49	37	6.68	
L angular gyrus	**-45**	**-70**	**31**	**7.12**	**489**
L angular gyrus	-54	-58	37	7.05	
L angular gyrus	-51	-58	28	6.79	
L caudate nucleus	**-12**	**11**	**4**	**6.46**	**74**
L caudate nucleus	-15	8	13	5.27	
L putamen	-15	14	-5	4.05	
L superior frontal gyrus	**-12**	**29**	**61**	**5.97**	**511**
L middle frontal gyrus	-27	29	52	5.95	
L superior medial gyrus	-3	26	43	5.70	
R superior temporal gyrus	**63**	**-55**	**22**	**5.84**	**201**
R angular gyrus	51	-55	25	5.29	
R angular gyrus	51	-55	37	5.16	
L middle frontal gyrus	**-27**	**53**	**25**	**5.70**	**28**
R caudate nucleus	**15**	**14**	**7**	**5.53**	**52**
R middle temporal gyrus	**54**	**-13**	**-14**	**5.26**	**82**
R middle temporal gyrus	66	-16	-17	5.07	
R middle temporal gyrus	63	-25	-11	3.91	
R rectal gyrus	**9**	**35**	**-26**	**5.01**	**31**
Rectal gyrus	0	41	-20	4.79	
L middle frontal gyrus	**-45**	**14**	**49**	**4.68**	**48**
L precentral gyrus	-42	8	40	4.50	
L middle frontal gyrus	-42	23	46	4.44	
Physical > neutral: NT					
L superior medial gyrus	**-6**	**26**	**40**	**6.35**	**117**
L posterior medial frontal	-3	14	49	4.97	
L superior orbital gyrus	**-30**	**62**	**-2**	**6.03**	**89**
L middle orbital gyrus	-39	56	-8	4.97	
L middle frontal gyrus	-36	59	7	4.02	
L inferior parietal lobule	**-48**	**-55**	**43**	**5.54**	**100**
L inferior parietal lobule	-57	-55	37	5.22	

L angular gyrus	-51	-55	28	4.81	
L precentral gyrus	**-48**	**8**	**49**	**5.29**	**37**

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, $q < 0.05$).

Table S3. Results from modeling just the outcome component of the trial: regions recruited for psychological vs. physical harm and vice versa by group.

Region name	MNI coordinates			t value	# of voxels
	x	*y*	*z*		
Psychological > physical: NT					
L superior medial gyrus	**-6**	**53**	**28**	**10.69**	**967**
Mid orbital gyrus	0	47	-11	7.64	
R superior medial gyrus	6	59	22		
Precuneus	**0**	**-58**	**31**	**8.51**	**277**
L middle temporal gyrus	**-54**	**-13**	**-23**	**7.57**	**276**
L middle temporal gyrus	-60	-10	-14	6.86	
L middle temporal gyrus	-54	-1	-23	5.67	
L middle temporal gyrus	**-21**	**29**	**52**	**6.74**	**66**
R middle temporal gyrus	**51**	**-1**	**-26**	**6.70**	**210**
R middle temporal gyrus	54	-13	-20	6.15	
R medial temporal pole	48	14	-38	4.52	
R middle temporal gyrus	**57**	**-64**	**22**	**6.46**	**214**
R middle temporal gyrus	51	-58	16	5.45	
R angular gyrus	51	-64	31	5.24	
L angular gyrus	**-48**	**-70**	**28**	**5.95**	**192**
L middle temporal gyrus	-60	-55	19	5.26	
L supramarginal gyrus	-63	-49	25	5.22	
Psychological > physical: ASD					
R precuneus	**3**	**-55**	**25**	**9.10**	**314**
L precuneus	-9	-52	43	5.41	
L precuneus	-6	-61	52	3.89	
R angular gyrus	**48**	**-64**	**28**	**7.47**	**179**
R middle temporal gyrus	60	-61	16	6.77	
R angular gyrus	45	-49	28	4.46	
L middle temporal gyrus	**-57**	**-4**	**-26**	**6.39**	**77**
L inferior temporal gyrus	-63	-10	-26	5.44	
L inferior temporal gyrus	-48	-7	-32	4.97	
Inferior parietal lobule	**-51**	**-64**	**46**	**6.05**	**98**
L angular gyrus	-48	-64	34	5.61	
L middle temporal gyrus	-36	-76	37	4.99	
L inferior temporal gyrus	**-42**	**-22**	**-26**	**5.31**	**41**
L inferior temporal gyrus	-51	-22	-26	4.61	
Psychological > physical: NT > ASD					
none					
Physical > psychological: NT					
R inferior parietal lobule	**39**	**-52**	**52**	**6.50**	**90**
R inferior parietal lobule	42	-43	46	4.67	

Physical > psychological: ASD

Physical > psychological: NT > ASD

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, *q* < 0.05).

Whole-brain analyses: intent component

The main focus of this paper is on psychological and physical harm. However, the experiment also manipulated information about intent—whether a harm was performed intentionally or accidentally. We tested the possibility that participants engaged in ToM differently for psychological harm and physical harm depending on whether the harm was caused intentionally or accidentally. We ran analyses focusing on just the intent component of the trial, as that was when intent information was presented. Results revealed no interaction between harm type and intent within the NT group (Table S4) as well as the ASD group (Table S5). We may be underpowered and thus cannot make strong claims about the lack of interaction we found here.

Moreover, we also examined whether ToM regions were overall recruited more for intentional harm vs. accidental harm or vice versa. This question was explored in published work using the same dataset (Chakroff et al., 2016; Koster-Hale, Saxe, Dungan, & Young, 2013), but this particular analysis (whole-brain analysis with a model of just the intent component of the trial) was not previously performed. When we conducted this analysis, we found just one significant cluster corresponding to the right lingual gyrus ([15, -76, -11], $k = 55$) for the contrast *intentional harm > accidental harm* in the NT group. No other significant activations were found. This result echoes that of previous work: ToM regions are not preferentially recruited more for intentional harm than accidental harm or vice versa in a consistent fashion.

Table S4. Results from modeling just the intent component of the trial: regions recruited for psychological vs. physical harm and vice versa for the NT group

Region name	MNI coordinates			*t* value	# of voxels
	x	*y*	*z*		
Intentional: psychological > physical					
R superior frontal gyrus	**27**	**5**	**58**	**5.00**	**64**
R superior frontal gyrus	27	-4	67	4.56	
R superior frontal gyrus	27	-7	58	4.10	
Accidental: psychological > physical					
none					
[Intentional: psychological > physical] > [Accidental: psychological > physical]					
none					
Intentional: Physical > psychological					
none					
Accidental: Physical > psychological					
R calcarine gyrus	**21**	**-64**	**13**	**5.64**	**274**
R cuneus	15	-82	28	5.50	
R lingual gyrus	15	-61	1	5.50	
[Accidental: psychological > physical] > [Intentional: psychological > physical]					
none					

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, *q* < 0.05).

Table S5. Results from modeling just the intent component of the trial: regions recruited for psychological vs. physical harm and vice versa for the ASD group

Region name	MNI coordinates			*t* value	# of voxels
	x	*y*	*z*		
Intentional: psychological > physical					
L precuneus	**-12**	**-46**	**31**	**5.92**	**52**
L precuneus	-9	-52	22	4.86	
L precuneus	-15	-55	34	4.72	
Accidental: psychological > physical					
none					
[Intentional: psychological > physical] > [Accidental: psychological > physical]					
none					
Intentional: Physical > psychological					
none					
Accidental: Physical > psychological					
none					
[Accidental: psychological > physical] > [Intentional: psychological > physical]					
none					

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, *q* < 0.05).

ROI analyses by component

NT: A linear mixed model was defined with percent signal change as the outcome variable, ROI and condition as predictor variables, and participant and item as random effects. Likelihood ratio tests (LRTs) revealed no difference between psychological harms and physical harms for the background, action, intent, and judgment components (ps > 0.05); however, there was a significant difference between psychological harms and physical harms during the outcome component: pairwise comparisons revealed greater activity for psychological harms than for physical harms ($t(36.43) = 3.538, p = 0.003$). Contrasts performed for each individual ROI revealed a significant difference between psychological and physical harms in the rTPJ ($t(35.57) = 3.577, p = 0.0029$), no significant difference in the lTPJ ($t(35.16) = 1.966, p = 0.1357$), a significant difference in the precuneus ($t(35.46) = 3.301, p = 0.0061$), and a marginally significant difference in the dmPFC ($t(512.9) = 2.263, p = 0.0621$).

ASD: See "Neural results for the ASD group".

Whole-brain analyses: including RT as a regressor

As in the main text, we found overlaps in activity for the *psychological harm > neutral act* contrast and the ToM network as elicited by the independent localizer task: namely, activity in precuneus and dmPFC (Table S6). However, we found no overlap with the ToM network for the *physical harm > neutral act* contrast.

We also directly compared physical and psychological harm (Table S7) as we did in the main text. The *psychological harm > physical harm* contrast revealed clusters with peak coordinates in the precuneus, a region in the ToM network. We note that when we used a more lenient threshold (voxel-wise $p < 0.01$), we also detected bilateral TPJ and dmPFC. Meanwhile, the contrast *physical harm > psychological harm* revealed no clusters.

No differences between the NT and ASD groups were observed here.

Table S6. Results from model of entire trial with RT as a regressor: regions showing greater activation in the NT group for psychological harm vs. neutral acts (top) and physical harm vs. neutral acts (bottom)

Region name	MNI coordinates			t value	# of voxels
	x	y	z		
Psychological > neutral: NT					
Precuneus	**0**	**-61**	**40**	**8.07**	**207**
L middle temporal gyrus	**-66**	**-25**	**-5**	**6.34**	**93**
L middle temporal gyrus	-54	-13	-23	4.46	
L middle temporal gyrus	-57	-7	-17	4.46	
L angular gyrus	**-57**	**-61**	**31**	**5.77**	**76**
L middle temporal gyrus	-42	-58	22	3.87	
L middle frontal gyrus	**-27**	**53**	**25**	**5.12**	**40**
L superior medial gyrus	**-6**	**44**	**28**	**4.91**	**40**
L superior medial gyrus	-3	53	28	4.05	
L superior medial gyrus	-6	50	37	3.90	
Physical > neutral: NT					
none					

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, $q < 0.05$).

Table S7. Results from model of entire trial with RT as a regressor: regions recruited for psychological vs. physical harm and vice versa by group.

Region name	MNI coordinates			t value	# of voxels
	x	*y*	*z*		
Psychological > physical: NT					
Precuneus	**0**	**-61**	**34**	**5.48**	**115**
R precuneus	6	-55	28	4.77	
L PCC	-9	-49	28	4.75	
Psychological > physical: ASD					
none					
Psychological > physical: NT > ASD					
none					
Physical > psychological: NT					
none					
Physical > psychological: ASD					
none					
Physical > psychological: NT > ASD					
none					

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, *q* < 0.05).

Neural results for the ASD group

ASD: Regions recruited for psychological and physical harm

      For the ASD group, the following regions were recruited more for psychological harms than

neutral acts (*psychological harm > neutral act*): the left angular gyrus, left middle temporal gyrus, left

posterior medial frontal, left precuneus, left middle frontal gyrus, left precentral gyrus, and right angular

gyrus (Table S8); similar to the NT group, several of these regions overlapped with the ToM network as

elicited by the localizer task. The following regions were recruited for the *physical harm > neutral act*

contrast: left angular gyrus, left middle frontal gyrus, and left middle occipital gyrus (Table S8); the left

angular gyrus overlapped with the lTPJ, a node in the ToM network as elicited by the localizer task.

ASD: Regions preferentially recruited for psychological harm vs. physical harm and vice versa

      We examined, at the whole-brain level, regions that were recruited more for psychological harm

versus physical harm and vice versa (Table 2). The contrast *psychological harm > physical harm* revealed

clusters with peak coordinates in the right precuneus, left middle temporal gyrus, and right supramarginal

gyrus. On the other hand, the contrast *physical harm > psychological harm* revealed no significant

clusters. What differs for the ASD and NT groups

ASD: The role of ToM regions in processing psychological harm and physical harm

      We also conducted ROI-based univariate analyses to examine the specific role of ToM regions in

processing psychological harm and physical harm versus neutral acts. We used linear mixed models to

compare the percent signal change within ROIs across the three conditions while taking into account by-

participant and by-item variance. Likelihood ratio tests (LRTs) revealed no significant interaction

between condition and ROI ($\chi^2(6) = 0.854$, $p = 0.99$). Importantly, there was a significant main effect of

condition ($\chi^2(2) = 10.954$, $p = 0.004$), and pairwise comparisons (with degrees of freedom approximated

using the Satterthwaite method and *p* values adjusted using the Tukey method for correction of multiple

comparisons) revealed a significant difference between psychological harms vs. neutral acts ($t(39.6)$ =

3.505, $p = 0.003$), no significant difference between physical harms vs. neutral acts ($t(39.6) = 2.171$, p =

0.09), and no significant difference between psychological harms and physical harms ($t(39.6) = 1.334$, p =

0.39). Overall, the results for the ASD group are similar to the results of the NT group and provide

evidence for the general pattern of condition effects across ToM ROIs: greater PSC for psychological

harms vs. neutral acts and no difference in PSC for psychological harms vs. physical harms.

We also examined PSC across individual components of the trial. A linear mixed model was

defined with percent signal change as the outcome variable, ROI and condition as predictor variables, and

participant and item as random effects. Likelihood ratio tests (LRTs) revealed no difference between

psychological harms and physical harms for the background, action, intent, and judgment components (*p*s

> 0.05); however, there was a significant difference between psychological harms and physical harms

during the outcome component: pairwise comparisons revealed greater activity for psychological harms

than for physical harms ($t(38.87) = 3.907$, $p = 0.001$). These results are similar to that found for the NT

group. Contrasts performed for each individual ROI revealed a significant difference in the precuneus

($t(34.94) = 4.808$, $p < 0.001$), a marginally significant difference between psychological and physical

harms in the rTPJ ($t(35.73) = 2.091$, $p = 0.106$), and no significant difference in the lTPJ ($t(35.16)$ =

1.942, $p = 0.142$) or the dmPFC ($t(280) = 1.315$, $p = 0.388$).

ASD: Information separating psychological harm from physical harm can be decoded from spatial

patterns of activity in the brain

We examined, using a searchlight procedure, regions for which the spatial patterns of activity for

psychological harm and physical harm can be accurately classified above chance level (50%). Above-

chance classification was found for clusters with peak coordinates in the precuneus and mid-cingulate

cortex (Table 3).

Additionally, we examined whether the spatial patterns of neural activity for psychological harm and physical harm could be accurately classified above chance level (50%) in any ToM ROI (Figure 4). Classification accuracy was marginally above chance level for the rTPJ ($t(14) = 1.581$, $p = 0.068$), at chance for the lTPJ ($t(11) = 0.660$, $p = 0.261$), significantly above chance for the precuneus ($t(15) = 4.002$, $p < 0.001$), and at chance for the dmPFC ($t(7) = 0.799$, $p = 0.225$). Meanwhile, permutation tests showed at-chance classification for all ROIs (ps > 0.05). These results are similar to that found for the NT group.

Table S8. Regions showing greater activation in the ASD group for psychological harm vs. neutral acts (top) and physical harm vs. neutral acts (bottom)

| | MNI coordinates | | | | |
Region name	x	y	z	t value	# of voxels
Psychological > neutral: ASD					
L angular gyrus	**-48**	**-64**	**28**	**7.63**	**211**
L angular gyrus	-57	-61	31	6.50	
Area PFm	-57	-52	46	5.76	
L middle temporal gyrus	**-54**	**-28**	**-2**	**7.47**	**205**
L middle temporal gyrus	-60	-7	-20	6.75	
L inferior temporal gyrus	-51	-19	-23	5.58	
L posterior medial frontal	**-9**	**23**	**61**	**7.24**	**61**
Posterior medial frontal	0	23	61	6.49	
L precuneus	**-3**	**-58**	**46**	**7.24**	**132**
L precuneus	-6	-52	34	6.33	
R precuneus	3	-52	25	4.89	
L middle frontal gyrus	**-30**	**26**	**52**	**7.11**	**59**
L middle frontal gyrus	-39	23	49	6.28	
L middle frontal gyrus	-45	26	40	4.12	
L precentral gyrus	**-45**	**5**	**49**	**5.82**	**46**
L middle frontal gyrus	-39	11	58	6.64	
R angular gyrus	**51**	**-67**	**31**	**4.74**	**53**
R angular gyrus	54	-61	25	4.11	
R middle temporal gyrus	60	-64	19	4.03	
Physical > neutral: ASD					
L angular gyrus	**-51**	**-58**	**31**	**7.05**	**168**
N/A	-60	-55	43	5.44	
L middle temporal gyrus	-60	-55	19	4.91	
L middle frontal gyrus	**-42**	**8**	**58**	**6.99**	**60**
L precentral gyrus	-42	8	49	6.36	
L middle frontal gyrus	-39	23	46	6.24	
L middle occipital gyrus	**-27**	**-91**	**-2**	**5.68**	**49**
L middle occipital gyrus	-24	-91	7	4.30	
L inferior occipital gyrus	-18	-97	-8	4.19	

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, $q < 0.05$).

Searchlight results using a different classifier

Table S9. Searchlight results using a Support Vector Machine (SVM) classifier.

Region name	MNI coordinates			t value	# of voxels
	x	y	z		
NT					
L middle temporal gyrus	**-48**	**-58**	**10**	**5.95**	**245**
L middle temporal gyrus	-48	-55	1	4.98	
L middle occipital gyrus	-33	-67	31	4.72	
Anterior cingulate cortex	**0**	**41**	**19**	**5.95**	**1268**
L superior medial gyrus	-6	50	16	5.90	
L precuneus	**-3**	**-55**	**34**	**5.57**	**423**
L precuneus	-3	-73	40	5.45	
L precuneus	-3	-64	37	5.04	
ASD					
R precuneus	**6**	**-61**	**46**	**8.10**	**223**
L midcingulate cortex	-9	-43	40	6.48	
Precuneus	0	-73	52	5.75	
Anterior cingulate cortex	**0**	**50**	**4**	**5.94**	**130**
L superior medial gyrus	-9	50	4	5.81	
R superior medial gyrus	6	56	7	5.53	
L inferior frontal gyrus	**-42**	**35**	**7**	**5.12**	**68**
L inferior frontal gyrus	-51	38	10	5.03	
L middle frontal gyrus	-39	44	16	4.72	
NT > ASD					
none					

Note: Regions in bold and plain denote peak and subpeak coordinates, respectively. All regions survived cluster-level correction (FDR, $q < 0.05$).