1. **Consent and Prescreening**

Thanks for participating in today’s study. I am Catherine and today I’ll be running the TMS study. This is (RA name) and she’ll be assisting with the study too!

So before we start, I’m going to have you fill out a consent form and another copy of the safety screening form. This is the same as what you filled out online, but we just want to double check everything. TMS is safe as long as you don’t have any preconditions that could increase risk of seizure, **so it’s very important that you fill out the screening form honestly.**

I’ll be right here as you fill these out, so feel free to ask questions.

1. **Set up Practice Round**

We’re going to have you do a practice task on the computer so you can familiarize yourself with the task. It is the same task you will do after the TMS session. The only difference is you’ll see new statements.

In this experiment you’re going to read a series of short statements and rate each on the degree that it was about facts, preferences, and morality. The statements will appear one section at a time, so first the statement will show up at the top, then you’ll have to press the space bar to see the ratings.

Once you press the space bar you’ll see all three ratings below the statement. The ratings will ask the degree that you think the statement is about facts, about preferences, and about morality. Use the ‘a’ and ‘d’ keys to slide the rating bar left and right, and use space to confirm your answer. If you move the bar all the way to the left, then you’d be saying that the statement is “not at all” about facts, morality, or preferences. If you move the bar all the way to the right, then you’d be saying the statement is “completely” about facts, morality, or preferences. Remember that you can give any combination of answers. So something could be completely about facts, but also a bit about morality, and not at all about preferences. You’ll pick an answer for the top question first, then after it’s confirmed, you’ll answer the second question, then the third question. Each time, you just need to press space to confirm your answer.

An important thing to keep in mind is that you you’ll have 14 seconds to give all your answers, so try to answer as fast as you can. When we let you practice in a moment, we’ll let you give the ratings without any time pressure, then we’ll add the time limit so you get a feeling for how much time you will have in the actual experiment. Do you have any questions about the instructions? It will make more sense once you actually do the practice round.

If you’re all set then you can press the space bar to get started.

<Let them complete the initial segment. Try not to make noise or interrupt them>

1. **Going into TMS room**

**(Have TMS box turn on and set to deliver one pulse at 30% power).**

**(Have Brainsight computer set up).**

**(Have testing computer set to start screen of FPM\_TMS. Should be on screen, white text on black background).**

Ok, so this is the TMS machine. We’re going to be using this magnet to apply brief pulses to your scalp. We’ll be doing this for 25minutes, after which you’ll complete the same task that you practiced outside. Before we start though, I want to show you what the magnet feels like.

First I’ll show you this on myself. This is a bit weaker then we’ll be using in the study, so you might not even feel this.

<Stimulate your own wrist>

Ok, now can you hold out your wrist?

<Stimulate participant’s wrist>

So again, that’s a bit weaker then we’ll be using. I’ll show you the pulse we’ll be using now.

<Change power to 60%; stimulate own wrist>

Can you hold out your wrist again?

<Stimulate participant’s wrist>

So you probably felt that. You’ll be getting that stimulation on your scalp for 25 minutes. It will feel like someone is tapping on your scalp. It is most likely going to be uncomfortable, but it should not be painful. If it is painful or if you feel uncomfortable and want to stop at any time, please just let me know and we’ll stop immediately.

Another thing to be aware of is that many people get facial ticks during the stimulation. This is just because the magnet is also stimulating muscles under the skin. So you might feel the right side of your face twitch. This is perfectly normal, and again, it may be uncomfortable but it should not be painful. If it is painful then please let me know and we can stop immediately.

Because having clenched muscles can make things more uncomfortable, we’ll try to have you relax as much as you can. So we will support your chin with a chin rest and we’ll get you the rest your arms on the table or on your lap, whichever is more comfortable. We’ll also will give you earplugs because the TMS machine is loud and will be close to your ear. And finally, we’ll also have you try to focus on your breathing, so rather than paying attention to the tapping sensation, you should try to focus on breathing in and out. You can keep your eyes open or shut, whichever is more comfortable for you.

Do you have any questions?

Great!

1. **Calibrate camera**

Ok. So now, we’re going to set up the camera. What we’re doing here is making sure we can match your face up with the MRI data that we collected before.

I’m going to put this head tracker on you. Can you please hold it in place on your forehead? Please be very careful not to touch the silver balls.

<Have them hold the head tracker in place on forehead. Wrap snuggly behind their head, running behind their ears.>

Ok, this can tend to ride up over time so I’m also going to use a few small pieces of tape to keep it in place.

<Tape the head strap on at each temple, using Micropore tape>

Ok. Now I’m going to need to map a few points on your face to let us line everything up with our MRI data. Can you turn your chair this way?

<Have them rotate their chair to face the door. Get the camera stand set up, centering them in the white bar in the Polaris set up screen>

I’m going to get right down in your face now to map these points. Please hold still for a moment.

<Sample each landmark. **Make sure that voice recognition was turned on for this**>

Ok, now I’m just going to make sure that this is well calibrated. I’m going to run the pointer along your scalp.

<Move to next screen on Brainsight computer. Run the pointer along their scalp. It should be within 2mm in the general area of RTPJ>

Ok. We’re almost ready. We just have one more measurement to make.

<Move to the next screen. Find RTPJ using the pointer. Have your assistant measure 5cm back from this point, horizontally around the curvature of the participant’s head. Set the pointer here, **in the orientation that you will eventually have the coil, i.e. pointing directly into their head**, and say SAMPLE.>

1. **Set up task and begin stimulation.**

Ok. So I’m going to get you set up for the stimulation now. First, I’m going to set up the task, then I’ll explain it.

<FPM TMS should be set up on the computer. Direct them to the screen>

Ok, so in the next part of the study you are going to read some new statements, but giving the same ratings as before. Just like before, you’ll see the statement, and you’ll have 14 seconds to rate how fact-like, moral-like, and preference-like it is.

We’re going to get ready for the stimulation now. While being careful with the headtracker, can you put your chin in the chinrest?

<Adjust the chinrest for them if necessary. Only the left wheel actually works. Make sure they can put weight onto it safely>

Ok. Give me a moment to get adjusted.

Once again, the stimulation will be for 25 minutes. Try to relax as much as possible and focus on breathing. We’ll check in with you every minute, then at 1, 5, 10, 15, and 25 minutes. But once again, please let us know if you’d like to stop at any time. I’ll let you know when the stimulation is nearly finished.

Are you ready to get started?

<If yes, then have Assistant press green button, then step on pedal>

<After 1 minute>

Ok, that’s one minute. How are you feeling?

<After 2 minutes>

Ok, that’s two minutes. Are you still feeling ok?

<After 3 minutes>

Ok, that’s three minutes. Are you still feeling ok? <wait for answer> Ok. I’ll let you know when we’re at 5 minutes.

<After 5 minutes>

Ok, that’s 5 minutes. There’s 20 minutes left to go.

<After 10 minutes>

Ok, that’s 10 minutes. You’re almost halfway.

<After 15 minute>

Ok, that’s 15 minutes. You’re over halfway there.

<After 22 minute>

Okay, you have three minutes left to go. When the stimulation stops, please press the spacebar to begin the task. Once again, you’ll read statements and rate how fact-like, preference-like, and moral-like each is.

<After stimulation ends>

Ok, you can get started.

**Mark down on the log sheet the number of trains that were delivered.**

1. **After stimulation**

Ok, you’re done. How are you feeling?

**<session 1>**

Ok. So that’s it for today. If you come with me to the lobby I’ll get you your payment and a receipt for you to sign. I’ll also just get you to wait for 10 minutes before leaving, just to make sure that you’re feeling ok.

**<session 2>**

Ok. So I just have one form for you to fill out and you’re done. We can do this in the lobby.

<Take to lobby and give demographics form>

Ok. And here is your payment and receipt. I’ll also get you to wait for 10 minutes before leaving, just to make sure that you’re feeling ok.

To give a bit more information about the study: we were interested in a brain region called the right temporoparietal junction, which is just above your ear. Some work has shown that this region is involved in thinking about other people’s minds. So, although we take it for granted that other people have beliefs, desires, and intentions, we actually can’t know for sure because we only have access to our own beliefs. So the idea has been that this brain region is involved in making that leap, and inferring that other people have minds.

In this study, we were trying to explore a slightly different idea. We thought that this same region might be involved when people think about whether moral claims are objective or subjective, or whether morals are more like facts or preferences. This region tends to be more active when people read subjective morals, and less active when they read objective morals (like “drinking and driving is wrong”). We used TMS to temporarily decrease activity in this region. We wanted to see if you perceived subjective morals as more fact-like when this region was deactivated. And we had to do two sessions because we stimulated this region in one session and a control region in another.

Do you have any questions?

Thank you so much for coming!