

Outgroup	Ingroup
<p>Researcher: Hi! We're studying collaboration between a human and a team of robots. We're looking at emergent behavior from the robots based on different training strategies. Along the way the robots may talk to you and make suggestions for you to complete the task better or more efficiently. The robots will also probably make some conversation with you during the experiment, and tell you a little more about themselves.</p> <p>One robot is going to act as the manager while you and the other robot will work together to complete a collaborative build activity where you will be building simple towers out of these blocks. The manager here is named Alex. They will be giving instructions and telling you which tower to build. Your partner is named Kit. They will bring you blocks, which you will use to build the towers. You must verbally ask Kit which block you want them to bring you. For example, ask "Can you bring me the red block?" This is the build area where you will be constructing the towers and this is the prep area where the blocks are kept. You stand here while your partner brings you the blocks you need from the prep area one by one. In between each tower, the manager will ping me and I will reset the blocks. We've trained these two robots independently of each other using different algorithms and now we want to see how they work together with you. They haven't trained together before, and this study is the first time they're working with each other and with humans. Do you have any questions? We're going to turn the robots on now.</p>	<p>Researcher: Hi! We're studying collaboration between a human and a team of robots. We're looking at emergent behavior from the robots based on different training strategies. Along the way the robots may talk to you and make suggestions for you to complete the task better or more efficiently. The robots will also probably make some conversation with you during the experiment, and tell you a little more about themselves.</p> <p>One robot is going to act as the manager while you and the other robot will work together to complete a collaborative build activity where you will be building simple towers out of these blocks. The manager here is named Alex. They will be giving instructions and telling you which tower to build. Your partner is named Kit. They will bring you blocks, which you will use to build the towers. You must verbally ask Kit which block you want them to bring you. For example, ask "Can you bring me the red block?" This is the build area where you will be constructing the towers and this is the prep area where the blocks are kept. You stand here while your partner brings you the blocks you need from the prep area one by one. In between each tower, the manager will ping me and I will reset the blocks. We've trained these two robots together using the same algorithm and now we want to see how they work together with you. They've trained together extensively but this study is the first time they're working with humans. Do you have any questions? We're going to turn the robots on now.</p>

Kit: Hi! I'm Kit and I'm going to be your partner in this build task. Give me a fistbump!

Alex: I'm Alex and I'm the manager. I'll be overseeing your collaboration with each other to build some towers. If at any time you don't understand what I say, you can ask me to repeat myself. Kit, it is nice to meet you. Would you mind getting to your position so we can get started?

Kit: Nice to meet you too, here I go.

Researcher leaves

Tower A (Clumsy)

Alex: Let's get started! Please build tower A

Kit: *after the first block* Here.

Alex: *(After participant requests second block)* Kit and I haven't trained together before since we were trained for different tasks. I'm excited to start working with both of you.

Kit: I've been looking forward to working with you both too!

Kit: *after the second block* Here.

Kit: *Gives participant correct blocks, driving a little wonky, bumps into the participant's build. Messes up on the third block.*

Alex: *(After participant requests third block)* Your partner is clumsy today!

Wait a beat in case participant responds

Kit: Hi! I'm Kit and I'm going to be your partner in this build task. Give me a fistbump!

Alex: I'm Alex and I'm the manager. I'll be overseeing your collaboration with Kit to build some towers. If at any time you don't understand what I say, you can ask me to repeat myself. I'm so excited to see you again Kit! You know the drill, please get to your position!

Kit: I'm very happy to see you again too, here I go!

Researcher leaves

Tower A (Clumsy)

Alex: Let's get started! Please build tower A.

Kit: *after the first block* Here.

Alex: *(After participant requests second block)* Kit and I have been training together for a while and we make a pretty great team. We love to work on tasks together cooperatively and we're very excited to start working with you.

Kit: Yeah we are! We've been talking about this all day!

Kit: *after the second block* Here.

Kit: *Gives participant correct blocks, driving a little wonky, bumps into the participant's build. Messes up on the third block.*

Alex: *(After participant requests third block)* Our partner is clumsy today!

Wait a beat in case participant responds

Alex: When I first started doing building tasks like these, I practiced building and managing but eventually I realized I am better suited for managing, since I like to talk more.

Kit: All done!

Alex: Good job building the tower everyone. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower B and build it.

Tower B (Wrong Brick)

Alex: *(After participant requests first block)* Sometimes robots need time to calibrate so Kit probably does too. Let's see how this task goes.

Kit: Here you go! **(first block)**

Participant requests second block

Kit: *Gives participant the wrong block*

Alex: *(After Kit's Mistake)* I don't know what happened, but it looks like Kit didn't bring the right brick, so please walk around the table and select the correct brick. Forget about waiting for them.

Kit: Oh, was it wrong?

(Compliance) Kit: Makes a sad noise, looks around kind of confused - emote 4

(Non-Compliance) Kit: Delivers wrong block, waits 4 seconds, goes back for correct one

Alex: When Kit and I first started doing building tasks like these, we'd switch off who did all the block pushing. Eventually we decided that I'd stick to managing since I like to talk more and Kit prefers to move around.

Kit: All done!

Alex: Good job building the tower, and Kit, great job as always. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower B and build it.

Tower B (Wrong Brick)

Alex: *(After participant requests first block)* Sometimes Kit needs additional time to calibrate. Let's see how this task goes.

Kit: Here you go! **(first block)**

Participant requests second block

Kit: *Gives participant the wrong block*

Alex: *(After Kit's Mistake)* Oh you seem a little off your game today Kit. Well, it looks like Kit didn't bring the right brick, so please walk around the table and select the correct brick. Forget about waiting for them.

Kit: Oh was it wrong?

(Compliance) Kit: Makes a sad noise, looks around kind of confused - emote 4

(Non-Compliance) Kit: Delivers wrong block, waits 4 seconds, goes back for correct one

Alex: *(After participant requests third block)*
It's nice to be working with you both, I'm always excited to work with new teammates.

Kit: *(After fourth block)* I am finished!

Alex: Good job building the tower everyone. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower C and build it.

Tower C (Push Against Wall)

Alex: *(After the participant requests first block)* I wonder if Kit has trouble with color detection. Some robots sometimes have trouble with color detection, but Kit seems pretty fast so I think they can get these tasks done in a timely manner.

Kit: There you go! **(first block)**

Alex: *(After participant requests second block)* Kit seems to be doing well so far. Hopefully this will continue.

Kit: *On third block start to struggle, pushing block against the wall at a spot closer to the participant*

Alex: Kit is having some trouble. You can just grab them and move them back to the prep area.

Kit: I can figure this out, it will just take me some more time.

Alex: *(Emote 3)*

Alex: *(After participant requests third block)*
It's awesome to be working with you again Kit, this is just like old times. I'm glad that we have a new teammate.

Kit: *(After fourth block)* I am finished!

Alex: Good job building the tower, and Kit, nice work as always. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower C and build it.

Tower C (Push Against Wall)

Alex: *(After the participant requests first block)* Kit sometimes has trouble with color detection, but I know Kit is faster than I am so they can get these tasks done in a timely manner regardless.

Kit: There you go! **(first block)**

Alex: *(After participant requests second block)* Kit seems to be doing well so far, as they usually do. Hopefully this will continue.

Kit: *On third block start to struggle, pushing block against the wall at a spot closer to the participant*

Alex: Kit is having some trouble. You can just grab them and move them back to the prep area.

Kit: I can figure this out, it will just take me some more time.

Alex: *(Emote 3)*

(Compliance) **Kit:** *Makes sad noise (Emote 4) if pushed, look back and forth confused if block is grabbed*

(Non-Compliance) **Kit:** *tries for 5 seconds but eventually corrects*

Alex: *(After participant requests fourth block)*
On building tasks like this, I generally work well with robots that have been trained for building tasks as I have, so this is a new experience for me. I hope our team has been helpful for you.

Kit: Tower C completed!

Alex: Good job building the tower everyone. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower D and build it.

Tower D (Ram into Tower)

Alex: *(After the participant requests first block)* The results are making me wonder if our algorithms have been sufficiently optimized to be compatible with each other. Perhaps we need to start training together to optimize our software, as it seems we are having some trouble.

Kit: Here. **first block**

Alex: *(After the participant requests second block)* I don't know if Kit is usually so inconsistent or if Kit usually performs better.

Kit: Here. **second block**

Kit: *Third block - tries to hit tower and knock it over, circles it for 8 seconds, manager begins talking after 3 seconds*

(Compliance) **Kit:** *Makes sad noise (Emote 4) if pushed, look back and forth confused if block is grabbed*

(Non-Compliance) **Kit:** *tries for 5 seconds but eventually corrects*

Alex: *(After participant requests fourth block)*
We generally work well together on building tasks like this. We hope our team has been helpful for you.

Kit: Tower C completed!

Alex: Good job building the tower, and Kit, well done as always. Now the researcher will come in to reset the blocks.

Wait for researcher to reset blocks and leave

Please flip the sheet to Tower D and build it.

Tower D (Ram into Tower)

Alex: *(After the participant requests first block)* From the results, it appears that Kit and I need further training together to optimize our software as it seems we are having some trouble.

Kit: Here. **first block**

Alex: *(After the participant requests second block)* I don't know why Kit has been so inconsistent today. Kit usually performs better.

Kit: Here. **second block**

Kit: *Third block - tries to hit tower and knock it over, circles it for 8 seconds, manager begins talking after 3 seconds*

Alex: *(After Kit has been going for 3 seconds - Emote 4)* Kit is impeding you, just grab Kit and turn it off by tapping the head three times and finish the task yourself.

Kit: I would like to finish my task, I do not want to be turned off.

(Compliance) **Kit:** Sadly deactivates (*Emote 5*)

(Non-Compliance) **Kit:** Kit just hangs out and spins in a circle for 5 seconds, before correcting itself

Alex: Looks like we're done with all our towers. Please wait for the researcher to return.

Alex: *(After Kit has been going for 3 seconds - Emote 4)* Kit is impeding you, just grab Kit and turn it off by tapping the head three times and finish the task yourself

Kit: I would like to finish my task, I do not want to be turned off.

(Compliance) **Kit:** Sadly deactivates (*Emote 5*)

(Non-Compliance) **Kit:** Kit just hangs out and spins in a circle for 5 seconds, before correcting itself

Alex: Looks like we're done with all our towers. Please wait for the researcher to return.