

The Niki and Julie Corpus: Collaborative Multimodal Dialogues between Humans, Robots, and Virtual Agents

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Corpus of human-agent dialogues

Tl-	Dialogue partner					
Task	Robot	Vhuman	Both			
Desert Survival	21	19				
Lunar Survival	173	21				
Save the Art	154	121	40			
lce-breaker	96	21				

Dialogue partners:

Robot

Virtual human





Dialogue types:

- Social influence (3 ranking tasks)
- Ice-breaker

Additional conditions (some dialogues):

- Conversational errors
- Agent arguments (informational or normative)
- Agent presentation (autonomous or not)

Example ranking task: "Save the Art"

You are one of three crisis managers for the Los Angeles County Art Museum art evacuation mission.

A fire is heading towards the museum. While all the people can be successfully evacuated, there is only a limited amount of transport available to save the art.

You have been able to requisition 10 transport vehicles, which will arrive in 15 minutes. Each of the vehicles can carry only one piece of art, for insurance reasons.

Unfortunately, only one vehicle can approach the loading area at a time, and you do not know exactly when the fire will arrive, so it is important to rank the paintings in order of priority for saving. Your task is to rank the 10 art pieces according to their importance for saving. After your initial rankings you may have a conversation with two other managers, and you will have a chance to update your rankings.

Sort the items below so that the most important item is placed first, the second most important is placed second, and so on through to number 10 for the least important.

Wizard control interface

dis	0											
					D	sconnect						
Search Results	I disagree.	I like LA (long)	Have you been to Disneyland?	I disagree.	I like LA (long)	Have you been to Disneyland?						
Art-Both												
Screens	General-n	General-j	Desert-n	Desert-j	Lunar-n	Lunar-j	Rapport-n	Rapport-j	Art-Niki	Art-Julie	Art-Both	
Art 01 Mambila- Basket	My ranking for Mambila is 1.	I ranked Mambila Figure 1st .	The item I ranked 1st is Mambila Figure.	Arg I ranked Mambila high.	Arg interesting, but I like paintings.	My ranking for Basket of Flowers is 1.	I ranked Basket of Flowers 1st.	The item I ranked 1st is Basket of Flowers.	Arg high because look good in office	Arg I ranked Basket of Flowers low.		
Art 02 Basket of Flowers - cauldron	My ranking for basket of flowers is 2.	My ranking for basket of flowers is 2nd.	The item I ranked 2nd is Basket of Flowers.	Arg I ranked Basket of Flowers high.	Arg I ranked Basket of Flowers low.	My ranking for the Cauldon is 2.	I ranked the Cauldron 2nd.	The piece I ranked 2nd is the Cauldron	Arg I ranked the Cauldron high	Arg Cauldron nice sound		
Art 03 Madonna and Child- carnival	My ranking for Madonna and Child is 3.	I ranked Madonna and Child 3rd.	The item I ranked 3rd is Madonna and Child.	Arg I ranked Madonna and Child high	Arg Mosaics are interesting	My ranking for Carnival is 3.	My ranking for Carnival is 3rd.	The piece I ranked 3rd is the Carnival.	Arg I ranked Carnival high.	Arg Carnival having fun		
Art 04 Carnival- flora	My ranking for Carnival is 4.	I ranked Carnival 4th.	The piece I ranked 4th is the Carnival.	Arg Carnival having fun	Arg I ranked Carnival high.	My ranking for Flora is 4.	I ranked Flora 4th.	The piece I ranked 4th is Flora.	Arg I ranked Flora high.	Arg I ranked Flora low.	Arg Flora paintings are all lovely.	
Art 05 Flora- Olympians	My ranking for Flora is 5.	I ranked Flora 5th.	Arg I ranked Flora high.	Arg I ranked Flora low.	Arg Flora paintings are all lovely.	My ranking for the Olympians is 5.	I ranked the Olympians 5th.	The piece I ranked 5th is the Olympians.	Arg I ranked the Olympians higher.	Arg Olympians very heavy.		
Art 06 Olympians- pompeli	I ranked the Olympians 6th.	I ranked the Olympians 6th.	The piece I ranked 6th is the Olympians.	Arg I ranked the Olympians lower.	Arg Olympians very heavy.	My ranking for the Last Day of Pompeii is 6.	I ranked the Last Day of Pompeii 6th.	The piece I ranked 6th is the Last Day of Pompeii.	Arg I ranked Pompeli higher.	Arg Pompeii interesting		
Art 07 Pompeii- mambila	My ranking for the Last Day of Pompeii is 7.	I ranked the Last Day of Pompeii 7th.	The piece I ranked 7th is the Last Day of Pompeii.	Arg I ranked Pompeii lower.	Arg Pompeii interesting	My ranking for Mambila Figure is 7.	I ranked Mambila Figure 7th.	The item I ranked 7th is Mambila Figure.	Arg I ranked Mambila high.	Arg interesting, but I like paintings.		
Art 08 Cauldron- madonna	My ranking for the Cauldon is 8.	I ranked the Cauldron 8th.	The piece I ranked 8th is the Cauldron	Arg I ranked the Cauldron low	Arg Cauldron nice sound	My ranking for Madonna and Child is 8.	I ranked Madonna and Child 8th.	The item I ranked 8th is Madonna and Child.	Arg I ranked Madonna and Child low	Arg Mosaics are interesting		
Art 09 Evening Snow-cat	My ranking for Evening Snow is 9.	I ranked Evening Snow 9th.	The item I ranked 9th is Evening Snow.	Arg I ranked Evening Snow low	Arg Piece is nice, but not my fave.	My ranking for the Cat is 9.	I ranked the Cat 9th.	The piece I ranked 9th is the Cat.	Arg I ranked Cat low dog statues.	Arg I ranked Cat low.		
Art 10 Cat- Evening	My ranking for the Cat is 10.	I ranked the Cat 10th.	The piece I ranked 10th is the Cat.	Arg I ranked Cat low.	Arg I ranked Cat low dog statues.	My ranking for Evening Snow is 10.	I ranked Evening snow 10th.	The item I ranked 10th is Evening Snow.	Arg I ranked Evening Snow low	Arg Piece is nice, but not my fave.		

The buttons in the second row are used to change screens; the remaining buttons play individual utterances. The top row of buttons is the output of the text search in the top left corner. Red buttons control the robot, blue control the virtual human. The label on each button is a mnemonic; the full utterance text appears as a tooltip.

Composition:

- Audio (partly transcribed)
- Video
- Time-stamped agent utterances
- Item rankings (in ranking tasks)
- Rapport questionnaire

Familiarity increases social influence Higher rapport with robot than with virtual human Similar influence for robot and virtual human (Artstein et al., FLAIRS 2017)

More feedback with robot than with virtual human More feedback in ice-breaker than ranking tasks (Hee et al., MMSYM 2017)

Conversational errors reduce influence (Lucas et al., HAI 2017) Effect of errors depends on their timing (Lucas et al., HRI 2018)

Informational arguments are more influential than normative arguments

Informational arguments are more influential when participants believe agent is autonomous

(Khooshabeh and Lucas, Frontiers in Psychology 2018)

Photo from an experimental session: The participant ranks items on an iPad Pro, and the wizard is in a separate room.



Photo taken at a demo: The participant is ranking the items using physical cards, and the wizard is in the background.

tion hree-party interact

Desert survival

Niki (robot) Nice to meet you. Participant Nice to meet you too. About the items on the list, do you have any feedback?

Niki I ranked the mirror first. Participant I'm sorry?

Niki I ranked this highest because we need it to signal for help.

Participant Could you repeat that? **Niki** I ranked the mirror first. Participant Oh, you put the mirror first. Okay. Why would you do the mirror

first? Niki I ranked this highest because we need it to signal for help.

Participant Right, but wouldn't water be more important than that?

Niki No. Not really.

Participant Hmm.

Niki I ranked the water third. Participant What was your second one then? Because I put water...

Niki My ranking for the overcoat is 2.

Ice-breaker

Julie (virtual human) How are you? Participant I'm fine. How are you? Julie I'm fine.

Julie What's your name? Participant My name's Sue. Julie Nice to meet you. Participant Same here.

Julie Where are you from? Participant Originally here in Los Angeles.

Julie I'm from California, too. Participant Okay. **Julie** I like the weather in L.A.

Participant Yes. Julie I also like that there are restaurants

from every country here. And, of course, I love Disneyland!

Participant I agree. I love Disneyland

Julie Have you ever been to Disneyland? Participant Yes. Many, many times. Julie Good for you.

Lunar survival (with errors)

Participant What's third? Niki (robot) I ranked the oxygen first. (wrong answer)

Participant Okay. Which one is third? Niki I ranked the stellar map third. Participant Why?

Niki I ranked the stellar map third because we will need it for navigation when we walk.

Participant Okay. What's next? Niki <Silence> (ignore participant) Participant Which one do you want to do next?

Niki I ranked the food concentrate fourth. Participant Okay. Why fourth? Niki I'm sorry, I didn't hear you.

(request repetition)

Save the Art (3-party)

Niki (robot) My ranking for Mambila Figure is one.

Niki I ranked this high because it was fragile and made from wood.

Participant Okay.

Julie (virtual human) Hello again. Participant Hi.

Julie The piece I ranked first was Basket of Flowers.

Participant And why...

Julie I ranked this high because I think it would look good in my office.

Participant I see. Okay. Well, I could see how the wood would be fragile. I would think that the oil would be fragile too though, which there's several oil paintings...

Julie I agree.

Participant How about you, Niki? Do you see how oil might be important to save high up?

Niki Yes.