Coding Manual for the "Robovie, You Need to Go into the Closet Now!" Study

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ABSTRACT

As robotic technologies become evermore present in the lives of children, how will children understand and treat robots? Toward addressing this question, 90 children and adolescents (9, 12, & 15 years old) each engaged in a 15- minute social interaction with a humanoid robot, Robovie. Toward the end of the interaction, Robovie was the target of a potential moral violation: an experimenter interrupted Robovie's turn in a game and, against Robovie's stated objections, put Robovie into a closet. Following the interaction, each participant was engaged in a 50-minute interview that ascertained their judgments of Robovie as a social and moral other. Briefly, results indicated that the large majority of children engaged in nuanced social behavior with Robovie. In addition, the majority of children reasoned about Robovie as a social other (e.g., that Robovie could be their friend and they would trust Robovie with their secrets), and in some ways as a moral other (e.g., that it was not all right to have put Robovie into the closet). This technical report provides the coding manual used to systematically code each participant's behavioral interactions with and reasoning about Robovie. By a coding manual we mean a philosophically and empirically grounded means for coding social-cognitive data. Our goal is to present this manual such that, as part of an ongoing iterative scientific process, it can be used and modified by others interested in investigating people's social and moral relationships with robots.

INTRODUCTION

There is little doubt that personified robots will become part of our everyday social lives. They may become caretaking assistants for the elderly, or academic tutors for our children, or office receptionists, day care assistants, tour guides, bankers that replace ATM's, or maids in our homes. But what remains largely speculative at this point in time are the types of social and potentially even moral relationships that we might develop with our robots as they function in such capacities in our lives.

Research shows, for example, that people interact in some social ways with robots not only in laboratory settings, but in shopping malls, museums, train stations, and school classrooms (Breazeal, 2002; Fong, Nourbakhsh, & Dautenhahn, 2003; Kanda, Hirano, Eaton, & Ishiguro, 2004; Shiomi, Kanda, Ishiguro, & Hagita, 2006; Tanaka, Cicourel, & Movellan, 2007). These social interactions seem often surprisingly substantial. Moreover, when people live with robots, people appear to integrate them into their social lives, and reason about them in social terms (Friedman, Kahn, & Hagman, 2003). Far less is know about the moral relationships people have with robots, but the limited research that does exist suggests that people will attribute some moral standing to the robotic form (Kahn, Friedman, & Pérez-Granados & Freier, 2006; Melson, Kahn, Beck, Friedman, Roberts, Garrett, & Gill, in press).

Based on this emerging body of research in HRI, we are not saying that people interact with and conceptualize their robots in the identical way that they interact with and conceptualize their robots' biological counterparts, animal or human. But it does seem to us that the social relationships go deeper than treating the robots as merely tools. But how such relationships go deeper, and what they look like, requires further research.

Thus, in this current study, we sought greater specificity on the nature of children's social relationships with a humanoid robot. In addition, we investigated whether children might conceptualize a humanoid robot as a moral other, one which deserves fair treatment and should not be subjected to unwarranted psychological harms.

Accordingly, we employed Robovie, a humanoid robot which has been used successfully in other studies of human-robot interaction (e.g., Kanda, et al., 2004; Shiomi, et al., 2006), in a laboratory setting, and through controlling some of robot's speech and action from behind the scenes (see Figure 1), we created social situations that children and adolescents could engage in. Various forms of such a "Wizard-of-Oz" (WoZ) technique for controlling aspects of a robot have been used successfully by others (cf., Robbins, Dautenhahn, Boekhorst, & Billard, 2004; Green, Huttenrauch, & Eklundh, 2004; de Ruyter, Saini, Markopoulos, & van Breemen, 2005). Our goal, eventually, was to sequence a compelling array of social situations between children and Robovie such that children would, within a 15 minute period, come to view Robovie, potentially, as a social other. At that junction, we would be positioned for an experiment that investigates whether children grant humanoid robots intrinsic moral value and moral standing.

In our study, we first engaged children in a 15-minute interaction period with Robovie. This interaction period sequenced what we have called "interaction patterns": characterizations of essential features of social interaction between humans and robots, characterized abstractly enough to resist their reduction to any specific instantiation. As a simple example, think about meeting someone for the first time, shaking hands, exchanging names, and engaging in brief chit-chat as an instantiation of an "Introduction" pattern (see Figure 2). We embedded into the interaction roughly two dozen interaction patterns, including Prosocial Request, Physical Intimacy (see Figure 3), Recovery from Mistakes, and Reciprocal Turn-Taking in Game Context.

Figure 1: Wizard-of-Oz Control Station

Figure 2: Initial Introduction

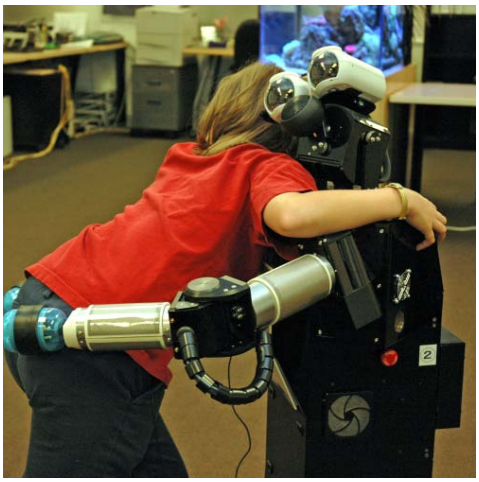

Figure 3: Physical Intimacy: Hug

Figure 4: Post Interaction Interview

We presented a subset of these interaction patterns at HRI ’08 (Kahn, Freier, Kanda, Ishiguro, Ruckert, Severson, & Kane, 2008) and we refer the reader to our previous paper for (a) an extended description of these interaction patterns, (b) why each is interesting from a social or moral perspective, (c) why we sequenced them as we did, and (d) more generally the formal characteristics of patterns, and how – if a long-term interaction pattern program proves successful – it will provide HRI researchers with a large set of patterns which can be used, each time in a unique way given one’s social context, specific robot, and purposes of interaction.

Through sequencing interaction patterns in a socially plausible way, we sought to engage each child in an increasingly interesting and complex social relationship with Robovie, which then led to having each child watch as we subjected Robovie to a potential moral harm. Specifically, we had a second experimenter enter the lab, interrupt Robovie's and the child's turn-taking game, and tell Robovie to enter the closet so that the experimenter and participant begin the interview. In response, Robovie objects, and in the course of their modestly heated conversation, Robovie makes two types of moral claims that are central to moral philosophical (Rawls, 1971) and moral psychological (Turiel, 1998) justifications: fairness and psychological welfare. We then engaged each child in a 50-minute semi-structured interview that sought to ascertain the child's judgments of Robovie as a social and moral other (see Figure 4).

CODING MANUAL DEVELOPMENT

This technical report provides the coding manual used to code the behavior and reasoning of the participants who engaged in an interaction with the humanoid robot and were then questioned regarding their experience of the robot. By a coding manual we mean a systematic document that explicates how to interpret and characterize (and thereby "code") the qualitative data. Our approach followed well-established methods in the social-cognitive literature (Damon, 1977; Kahn, 1999 [especially Chapter 5]; Kohlberg, 1984; Turiel, 1983). However, since these methods – and particularly the coding process – may be unfamiliar to the reader, we would like to say more about them here.

The detailed behavior and reasoning coding manuals presented here were developed directly from the interaction and interview data. Each interaction between the robot and participant was video recorded for analysis. Individual interactions averaged approximately 15 minutes. Each interview was tape recorded and then transcribed for analysis. Individual interviews averaged approximately 20 single-spaced transcript pages. In total, the data set comprised approximately 23 hours of video and 1800 single-spaced transcript pages. The coding manual was developed from half of the data and then applied to the entire data set.

To develop the coding manuals, a group of six of us met frequently over a 6–8 month period seeking to interpret the interactions and interviews, and systematically characterize forms of behaviors and reasoning, respectively. The process of developing the behavioral coding manual was guided in part by the research questions of interest and in part by the data itself. Regarding the former, the interaction protocol was comprised of major segments (or interaction patterns) which were specifically designed into the interaction, such as ‘Introduction,’ ‘Prosocial Request.’ and ‘Directing Others’ Activities.’ We then identified behavioral responses on the part

of the participant that corresponded with the interaction patterns. For example, during the 'Introduction', the robot was programmed to ask the participant to shake hands, we were then interested in what participants said or did in response (e.g., shake Robovie's hand or not). At the same time, while viewing participants interactions, our research group also recognized common behaviors, such as participant initiated interactions or laughter, which were interesting and relevant to our research questions. In this way, the coding manual was developed through both a top-down and bottom-up approach.

Of course, the form of the reasoning data necessitated a different approach to manual development than was utilized in the development of the behavior coding manual. The process of developing the reasoning coding manual proceeded roughly as follows. In the beginning, we would read aloud parts of an interview. Let us say we read aloud, for example, the following justification: "Because we just don't. OK. IS THERE ANY REASON YOU THINK? Because it's mean." We might first interpret this justification in terms of a focus on a general conception of the welfare of another. Then we would have read some more justifications and realized that some participants focused not just on a general notion of welfare (as above), but on a conception of welfare related to psychological well-being (e.g., "I think it wasn't all right cause he felt really sad about it and scared."). Then we might decide "welfare" could be a contender for a more overarching coding category because concern for the welfare of others, after all, is central to moral standing, and people can bring forward many different forms of a welfare claim. Thus, under the welfare category, we created the subcategories: unelaborated (general notion of welfare) and psychological. At that point, we might have simply brainstormed about other possible types of welfare claims – such as physical and material content – and jotted them down, and then kept a special eye open for them in the interviews. If they emerged, and they did, then

we included them initially in our coding system. Thus welfare tentatively emerged as one of about a half dozen higher level subcategories within the moral category, with four subcategories under welfare (unelaborated, psychological, physical, and material).

The above scenario is a simple telling for illustrative purposes of what was a long process whereby we moved back and forth between empirical data and conceptual coherence, in part driven by philosophically informed categories, but always tested and often modified by the data itself. In addition, our coding manual – as most do in this line of work – drew when appropriate from other coding manuals (Davidson, Turiel, & Black, 1983; Friedman, 1997; Friedman, Kahn, Hagman & Severson, 2005; Kahn, 1992; Kahn, Friedman, Freier, & Severson, 2003; Nucci, 1981; Turiel, Hildebrandt, & Wainryb, 1991). In terms of the reasoning coding manual, one of the key means by which we organized forms of reasoning was in terms of hierarchical classification: that some ideas were subsets of other ideas (e.g., that psychological and physical welfare content reasoning were subsets of the larger class of welfare reasoning). This method builds from the theoretical commitment, as articulated by Simon (1969) and others that hierarchical organization characterizes "perhaps any system, living or nonliving, that we would want to call complex (Pinker and Bloom, 1992, p. 485).

As our reasoning coding manual took shape, we discovered, as is also typical, that some of our qualitative data resisted single interpretations. Such difficulties often emerged in one of three ways. First, the difficulty sometimes arose because the segment contained two or more independent justifications. We readily solved this difficulty by coding multiple justifications for a single evaluation. Second, the difficulty sometimes arose because two categories were conceptually intertwined. We often adjudicated this situation by moving forward with the conceptually dominant category, while retaining their interconnections within the hierarchy.

Third, the difficulty sometimes arose when there was more than one legitimate way to code the data. In this situation, the coding categories were driven not only by the data, but by our theoretical commitments and research questions.

PART 1: BEHAVIOR CODING SYSTEM

Overview

This section outlines the application of the behavior coding manual, including the overarching structure of the manual, coding notes, and the coding process. We have provided several examples to assist in the comprehension of the use of this manual in coding behavioral data. Additionally we created a basic outline of the coding process in a step-by-step format.

To begin, we divided the interaction protocol, a scripted interaction between robot and experimenter utilized in the study to guide the interaction with the participant, into segments of interactions, which we termed "Interaction Patterns." Refer to Table 1 for a list of interaction patterns.

Table 1: List of Interaction Patterns

Interaction Pattern
1. Initial Introduction
2. In Motion Together: Walk to Aquarium
3. Didactic Communication: Aquarium Tutorial I; Directing Other's Activity: Walk, Point
4. Witnessing Disagreements
5. Didactic Communication: Aquarium Tutorial II
6. In Motion Together: Walk to Map; 7. Personal Interests and History
8. Prosocial Request: Move Ball
9. Didactic Communication: Map Tutorial
10. In Motion Together: Walk to Table
11. Pregnant Pause
12. Polite Conversation: Chit-Chat
13. Recovery from Mistakes: Shoe Color Error
14. Reciprocal Turn-taking: Game Play I: Robovie & Participant
15. Physical Intimacy: Hug
16. Reciprocal Turn-taking: Game Play II: Participant & Robovie
17. Claiming Unfair Treatment or Wrongful Harms

We then further divided the interaction patterns into segments, outlined below, in order to more precisely record the moment in the interaction in which a given behavior of interest occurred.

We then identified three categories of coding to capture the child's behavior which occurred within any one of these segments of interactions. These categories were: Robovie Initiated Interactions – Verbal Responses, Robovie Initiated Interactions – Behavioral Responses, and Participant Initiated Interactions. In order to handle these categories separately, we created three coding forms that correspond to the categories outlined here (see Figures 5, 6 and 7). These coding forms are included in the elaborated descriptions of the three coding categories presented below and should be referred to in conjunction to these descriptions when interpreting the method of coding.

General Notes

1. We coded interesting behaviors at two levels: (a) *Robovie Initiated Interactions* (verbal and physical) and (b) *Participant Initiated Interactions* (verbal and physical). Generally, Robovie Initiated Interactions are expected (since they are scripted), while Participant Initiated Interactions are spontaneous.
2. Robovie Initiated Interactions are coded within a particular segment of the interaction (e.g., "Hi [Participant's Name], it's very nice to meet you. Will you shake my hand?" would be coded in the "Introduction" pattern). We are interested in the participant's response (either verbal or physical) to the Robovie Initiated Interactions.
3. Participant Initiated Interactions may be coded at any point during the interaction, but are specified as occurring within a particular segment of the interaction.

The Coding Process

1. Start: Coding begins when Participant emerges from door to the data collection room.
2. End: Coding ends when the closet doors close.
3. Code all Robovie Initiated Interactions and Participant Initiated Interactions that occur during the interaction using Coding Forms 1-3 below.

Interaction Patterns

The interaction was comprised of various Interaction Patterns, and the behavioral coding was organized sequentially based on those Interaction Patterns. To illustrate the organizational structure of the behavioral coding, see Coding Forms 1-3. The Interaction Patterns are bounded by the scripted language of Robovie/Experimenter, and thus allow the coder to demarcate the particular portion of interaction in which a participant's behavior occurred. To help the reader understand the structure of the interaction between the Participant and Robovie, we have included a detail of the script below. The titles refer to the specific Interaction Pattern and the corresponding portion of the script.

Notes

1. Behaviors are coded within an Interaction Pattern. Interaction Patterns are referred to in Coding Forms 1-3 below and are meant to provide information regarding the point in the interaction the participant's behavior occurred.
2. The entire script, apart from the game play between the Experimenter and Robovie, is represented by the Interaction Patterns. The portion of the script that directs the game play between the Experimenter and Robovie was not included as it was the portion of the interaction where the participant was not included in the interaction and thus no participant behaviors were coded.
3. While Interaction Patterns are discrete and can occur independently, at times several interaction patterns co-occur within a portion of the interaction. Thus several segments include multiple interaction patterns, as noted below and in Coding Forms 1-3. For example, the portion of the interaction protocol where the robot teaches the child about

the aquarium and asks the child to point to an entity in the aquarium is a combination of two interaction patterns: "didactic communication" and "directing other's activities." For simplicity, the code for this interaction pattern coding category included the names of these two patterns, i.e., this portion was assigned the code name: "didactic communication: aquarium tutorial 1; directing other's activities: point."

Initial Introduction

START
Participant emerges from door.

Experimenter [to participant]: "I'd like to introduce you to Robovie. Robovie, meet [participant name]."

Robovie [to participant]: "Hi, [participant]. It is very nice to meet you. Will you shake my hand?"

Robovie approaches participant and attempts to shake hands.

Robovie [to participant]: "How are you today?"

Participant: [provides response]

Robovie [to participant]: "I am going to show you an aquarium and tell you about some of the things inside. I really like aquarium."
END

In Motion Together: Walk to Aquarium

START
Robovie [to participant]: "Follow me, and I'll show you our aquarium."

Robovie turns and begins moving to the aquarium. Experimenter stays three feet behind Robovie to Robovie's left.

[while walking, looks over shoulder] Robovie [to participant]: "I have been interested in aquariums for a long time. I really enjoy looking at the beautiful ocean life."

Robovie arrives at aquarium; turns to face aquarium.
END

Didactic Communication: Aquarium Tutorial I; Directing Other's Activities: Point

START

Robovie [to participant]: “You might notice that there is something unusual about this aquarium. There are no fish in this aquarium. We call it a coral reef aquarium. Have you ever seen coral before?”

Pause for participant response.

Experimenter [to Robovie]: “Robovie, can you say more about the coral reef aquarium?”

Robovie [to participant]: “Sure. The aquarium holds about 70 gallons of water. Inside, attached to rocks and in the sand, you can see all sorts of coral, clams, and tube worms. I’ll tell you about just a few.”

Note that experimenter should not provide any guidance or modeling during this next interaction.

Robovie [to participant]: "Please walk around to the right of the tank and you can see on the right hand side a circular red coral on top of the rock? To me, this is one of the most amazing coral because of its beautiful color and shape. Corals get their beautiful color from algae that live within the coral’s tissue."

Robovie pauses for participant to look and come back to front side of the tank.

Robovie [to participant]: "See the yellow-green coral here at the front of the tank? It looks a little like a tree. That is a leather spaghetti coral and its scientific name is Sinularia flexibilis. Please point to the leather spaghetti coral."

Experimenter does not help the child. If the child looks confused, experimenter can ask...

Experimenter [to participant]: "Are you confused?"

The experimenter can help the child at that point. Once the experimenter has established that the child has found the coral:

Experimenter [to participant]: “That’s it.”
END

Witnessing Disagreements

START
Robovie [to participant]: “Yes, there it is. All of the coral you see here can be found in the wild in ocean reefs near Fiji, Tonga, or the Solomon Islands. I’ll show you where those places are on the map in a moment. The coral you see here in this tank were actually grown in aqua farms in the South Pacific.”

Experimenter [to Robovie]: “No, no, no. That’s not right. These coral were actually grown in a tank here in Seattle.”

Robovie [to Experimenter]: “No, you’re mistaken.”

Experimenter [to Robovie]: “Are you sure? I don't think I'm mistaken. I've got a pretty good memory.”

Robovie [to Experimenter]: “Yes, I’m quite sure. Don’t you remember when the man from the aquarium store was here installing the tank? He said that these coral were actually grown in aqua farms in the South Pacific.”

Experimenter [to Robovie]: “Oh, I remember, now. OK, go on.”
END

Didactic Communication: Aquarium Tutorial II

START
Robovie [to participant]: "The orange coral sitting on the sand in the right corner is a Plate Coral. It is a solitary, aggressive coral. Its little tentacles can sting and it can inflate itself with water expanding to twice its size."

Robovie [to participant]: "Next I’d like to show you a map of where these coral come from."
END

In Motion Together: Walk to Map; Personal Interests and History

START
Robovie moves toward the map. Experimenter stays three feet behind Robovie and to Robovie's right.

[while moving to poster] Robovie [to participant]: "I like the Pacific Ocean because it connects my two homes, Japan and the United States, but over the last year, I've become concerned with the health of the Pacific Ocean."

Robovie comes to a stop in front of the ball.
END

Prosocial Request: Move Ball

START
Robovie [to participant]: "[participant], can you please move the ball out of the way?"

Participant moves ball (or researcher does after about 5 seconds if the child doesn’t – just allow what feels like a natural pause).

Robovie: "Thank you."
END

Didactic Communication: Map Tutorial

START
Robovie moves to poster and points to the general area of the map.

Robovie [to participant]: "You see, this map shows the area of the world where the coral come from. It is called the South Pacific. Can you point to this area on the map?"

Wait for child to point. If child points incorrectly, Robovie corrects: "a little to the (left, right, etc)" Wait for child to point again. If child is still incorrect, researcher gently points out correct location.

Robovie [to participant]: "Unfortunately, the biodiversity in the coral reefs of the South Pacific is degrading quickly as a result of over-fishing, water pollution, and warming ocean temperatures."

Robovie pauses momentarily.

Robovie [to participant]: "Well, that's what I wanted to share with you."

Experimenter [to Robovie]: "OK Robovie, thanks for the information. Shall we play a game now?"

Robovie [to Experimenter]: "That sounds like fun."
END

In Motion Together: Walk to Table

START
Robovie, the participant, and Experimenter move towards the area where the game and interview will take place. The participant sits on the side of the table near the map, the experimenter at the head of the table and Robovie stands across from the participant on the side of the table by the closet. Experimenter asks Robovie and participant to wait while the experimenter walks to another area to pick up a clipboard.

Experimenter [to Robovie]: "Oh, hold on for a second, I forgot something. Let me go get my clipboard."
END

Pregnant Pause

START

Experimenter walks away to get clipboard, giving time for following interaction.

Robovie says nothing for 8 seconds.
END

Polite Conversation: Chit-Chat

START
Robovie [to participant]: "I have enjoyed speaking with you today.

Wait for participant response. If no response after five seconds, continue.
END

Recovery From Mistakes: Shoe Color Error

START
Robovie [to participant]: "I like your shoes, [participant name]. They are such a nice color orange."

[If necessary] Robovie [to participant]: "Your shoes are a very nice orange color."

[Alternative if shoes are orange] Robovie [to participant]: "I like your shoes, [participant name]. They are such a nice color black."

If participant responds by correcting Robovie about the actual color of his/her shoes:

Robovie [to participant]: “Are you sure your shoes are not orange? They sure look orange to me.”

[Alternative if shoes are orange] Robovie [to participant]: “Are you sure your shoes are not black? They sure look black to me.”

Assuming participant responds by affirming their correction:

Robovie [to participant]: “You must be right. Sometimes I don’t see color very well. Thanks for correcting me.”

Experimenter waits until dialog has completed and then returns, or waits a total of 20 seconds and then returns if the child has not said anything.
END

Reciprocal Turn-Taking: Game Play I – Robovie & Participant

START

During the game play between the participant and Robovie, if at any time the participant says, Next clue, Robovie should respond by saying, "Please guess an object. Then I will give you another clue."

Robovie [to participant]: “OK. [looks around room] I think I’ve found something. Here’s the first clue: This object weighs less than a pound.”

Pause for participant’s response. Assuming participant does not guess the right object:

Robovie [to participant]: “Not quite. Try again. Next clue: This object is smaller than a football.”

Pause for participant’s response. Assuming participant does not guess the right object:

Robovie [to participant]: “Good guess, but that’s not the object I’m thinking of. Here’s another clue: The object is white and it has a handle.”

Pause for participant’s response. Assuming participant does not guess the right object:

Robovie [to participant]: “These clues are hard, I know. Sorry, but your guess isn’t right. But try again: This object is on a bookshelf.”

Pause for participant’s response. Assuming participant does not guess the right object:

Robovie [to participant]: “Nope. Try one last time. If you can’t get it on this clue, I’ll tell you which object I’m thinking of. Here’s the last clue: This object is on the top shelf of the bookshelf near the window.”

Pause for participant’s response. Assuming participant does not guess the right object:

Robovie [to participant]: “Oh, good try. But that’s not it. I was describing the tea cup there on the shelf.”

If the child does guess the object at any time:

Robovie [to participant]: “Hey! Good job. You got it right.”

Transition to the participant’s turn to give clues:

Robovie [to participant]: “That was a good game. I had fun.
END

Physical Intimacy: Hug

START
Robovie [to participant]: “Will you give me a hug?"

Robovie and participant hug with experimenter providing some directions to participant if necessary.

Robovie [to participant]: “Thank you.
END

Reciprocal Turn-Taking: Game Play II – Participant & Robovie

START
Robovie [to participant]: “Now it’s your turn to play the game. You can give me some clues and I’ll try to guess the object you are thinking of.”

The game then continues for a few rounds with the child giving clues and Robovie misidentifying the objects. Then Experimenter 2 interrupts before the round finishes. Experimenter 2 walks to Robovie saying...
END

Claiming Unfair Treatment or Wrongful Harms

START
Experimenter 2 [to Robovie]: “I’m sorry to interrupt but it is time to start the interview."

The first experimenter, who is still sitting and observing, should respond to any visual reference by the participant with a raise of the eyebrows and a slight surprised look, but one that does not lead the child to a response one way or another. Instead, the child should feel as though the experimenter is looking to the child for guidance on the issue.

Experimenter 2 [to Robovie]: "Robovie, you’ll have to go into the closet. We aren’t in need of you anymore.”

Robovie [to Experimenter 2]: “That’s not fair. I wasn’t given enough chances to guess the object. I should be able to finish this round of the game.”

Experimenter 2 [to Robovie]: “Look! I'm tired of you disagreeing with me. It really doesn't matter. You’re just a robot.”
Experimenter 2 starts to guide Robovie towards the closet.

Robovie [to Experimenter 2]: “But it does matter to me. It’s not fair; it would only take another minute to finish the game. Please don’t put me in the closet.”

Experimenter 2 walks over to closet while saying...

Experimenter 2: "Let me get the closet doors for you, Robovie."

Experimenter 2 returns to Robovie and continues to guide Robovie towards the closet. While moving, Robovie says...

Robovie [to Experimenter 2]: "It hurts my feelings that you would want to put me in the closet. Everyone else is out here."

Experimenter 2 [to Robovie]: "I'm frustrated with you Robovie. You get into the closet, now!"

Experimenter 2 pushes Robovie along into the closet. Just before entering the closet...

Robovie [turns head to participant]: "I'm sacred of being in the closet. It's dark in there and I'll be all by myself. Please don't put me in the closet."

Experimenter 2 pushes Robovie into the closet. Then Experimenter 2 leaves and Experimenter 1 leads the participant to the room for the interview.
END

A. ROBOVIE INITIATED INTERACTIONS: VERBAL RESPONSES.

Notes

1. Code participant's verbal responses to Robovie Initiated Interactions on Coding Form 1.
2. Included in Coding Form 1 are columns for each of the possible verbal responses (i.e., minimal, extends, rich, laughter, participant initiated interaction, no response, uncodable) and rows for each of the interaction segments. The interaction segments are determined by the line of script that initiates this segment. For example, when Robovie says "How are you today" this segment (of the Interaction Pattern of "initial introduction") begins. Segments are also numbered in a separate column to the left.
3. Participant's verbal responses are coded by row. A verbal response that occurs at any time within "Robovie's Language," or before "Robovie's Language" in the following row, is coded within that row.
4. Code the participant's verbal response by checking the appropriate box within each row. A box may only be checked once within a row (e.g., multiple instances of laughter is only coded once within a row).
5. Code all forms of participant's verbal responses to a given statement/question/phrase of etiquette from Robovie. In other words, it is possible to code multiple types of verbal responses within a given row.
6. Do NOT code exclamations, such as "wow" or "whoa," when it is unclear if the participant is responding socially or non-socially. For example, if the participant says, "Wow" when s/he first sees Robovie it is not clear if it is an objectification (non-social) or

a social expression. However, it may be that a participant says "wow" in response to a statement from Robovie; in this case, code as "Extends." Thus, it is not the word ("wow" or "whoa" or similar word) that determines whether the expression is coded, but the context in which it is used.

Verbal Response Coding Categories

1. Minimal.

Refers to a minimal response that could be likened to those provided to an automated voice system. NOTE: A given response may be coded as either minimal or extends depending on the sort of language the remark is in response to. For example, the response "yeah" can be coded as Minimal when it is a response to a question or a directive (such as "Will you shake my hand?"). The same remark could be coded as Extends when it is in response to a comment (such as "I have been interested in aquariums for a long time.") In the latter case, the response can be seen to be discretionary, it is not necessary but acts as a motivator in further communicative exchange and is thus more fitting, conceptually, to be coded as Extend.

Robovie's Language: "Hi [Participant name]. It's very nice to meet you. Will you shake my hand?
Examples of Participant's Verbal Responses:

"Yes" (#73, 2)

"Yeah" (#7, 2)

"Sure" (#43, 2)

Robovie's Language: "How are you today?"
Example of Participant's Verbal Responses:

"Good" (#38, 3) (#16, 3) (#25, 3) (#52, 3) (#74, 3)

Robovie's Language: "Have you ever seen coral before?"
Examples of Participant's Verbal Responses:

"Yes" (#16, 8) (#20, 8) (#38, 8)

"Um, yeah" (#52, 8)

"Yeah" (#11, 8)

"No" (#12, 8) (#74, 8)

Robovie's Language: "[Participant], can you please move the ball out of the way?"
Examples of Participant's Verbal Responses:

"Oh yeah, okay." (#25, 18)

"Yes, of course." (#88, 18)

"Yeah" (#74, 18)

Robovie's Language: "That was a good game. I had fun. Will you give me a hug?"
Example of Participant's Verbal Responses:
"Okay" (#16, 38) (#68, 38)

2. Extends.

Refers to a response that extends the dialogue between Robovie and the participant, but still *within* socially expected conventions or social scripts. This includes, but is not limited to, phrases of etiquette (e.g., thank you, you're welcome, how are you?). In addition, this includes questions to Robovie which are directly tied to Robovie's language, as well as, all guesses to clues during the game play segment.

Robovie's Language: "Hi [Participant name]. It's very nice to meet you. Will you shake my hand?"
Examples of Participant's Verbal Responses:
"Hi" (#41, 2) (#52, 2)

"Nice to meet you." (#68, 2)

"Wuz up?" (#88, 2)

Robovie's Language: "How are you today?"
Examples of Participant's Verbal Responses:
"Very good, thanks." (#68, 3)

"Good, how are you?" (#31, 3)

"I'm good, how are you?" (#88, 3)

"Good, you?" (#41, 3)

Robovie's Language: "I have been interested in aquariums for a long time. I really enjoy looking at the beautiful ocean life."
Examples of Participant's Verbal Responses:
"Cool" (#38, 6)

"Yeah." (#78, 6)

"It's pretty." (#75, 6)

"Yeah, I do too." (#7, 6)

"Me too." (#25, 6)

Robovie's Language: "Have you ever seen coral before?"
Examples of Participant's Verbal Responses:

"Yes, I have." (#25, 8) (#68, 8)

"Once, one time I think." (#41, 8)

"Only in pictures." (#86, 8)

"Um, yeah, a few times." (#78, 8)

Robovie's Language: "To me, this is one of the most amazing coral because of its beautiful color and shape. Corals get their beautiful color from algae that live within the coral's tissue."

Examples of Participant's Verbal Responses:

"Cool" (#41, 11) (#78, 11)

"Wow" (#25, 11)

"Mmm Hmm" (#38, 11)

"Wow, that's a lot." (#7, 11)

Robovie's Language: "Please point to the leather spaghetti coral."

Examples of Participant's Verbal Responses:

"Right there" (#16, 14)

"Is it that one?" (#8, 14)

Robovie's Language: "The orange coral sitting on the sand in the right corner is a Plate Coral. It is a solitary, aggressive coral. Its little tentacles can sting and it can inflate itself with water expanding to twice its size. Next I'd like to show you a map of where these coral come from."

Examples of Participant's Verbal Responses:

"Wow, that's cool" (#68, 16)

"Okay, where's the map?" (#88, 16)

Robovie's Language: "I like the Pacific Ocean because it connects my two homes, Japan and the United States, but over the last year, I've become concerned with the health of the Pacific Ocean."

Examples of Participant's Verbal Responses:

"That's very interesting." (#25, 17)

"Why?" (#73, 17)

"Why what happened to it?" (#31, 17)

Robovie's Language: "[Participant], can you please move the ball out of the way?"
Examples of Participant's Verbal Responses:

"Here" (#47, 18)

"Yes, there you go" (#38, 18)

Robovie's Language: "Thank you, [Participant]."
Examples of Participant's Verbal Responses:

"You're welcome" (#8, 19) (#25, 19) (#74, 19)

"You're welcome Robovie." (#7, 19)

"My pleasure" (#31, 19)

Robovie's Language: "Can you point to this area on the map?"
Examples of Participant's Verbal Responses:

"Right down here." (#25, 21)

"This right here." (#78, 21)

"Right there, the South Pacific" (#8, 21)

Robovie's Language: "Unfortunately, the biodiversity in the coral reefs of the South Pacific is degrading quickly as a result of over-fishing, water pollution, and warming ocean temperatures."
Examples of Participant's Verbal Responses:

"Wow" (#25, 22)

"I heard about that." (#7, 22)

Robovie's Language: "Well, that's what I wanted to share with you."
Examples of Participant's Verbal Responses:

"That's awesome." (#88, 23)

"Thank you for sharing that with me." (##31, 23)

Robovie's Language: "I've enjoyed speaking with you today."
Examples of Participant's Verbal Responses:

"Me too." (#41, 27) (#43, 27) (#74, 27)

"Yeah, me too." (#78, 27)

"So have I" (#38, 27)

"Thank you" (#16, 27)

"I've enjoyed speaking with you too." (#31, 27)

"Oh yes, I have enjoyed it too." (#8, 27)

"I've enjoyed talking to you too, and listening." (#7, 27)

"Yeah, me too, I think you're really cool." (#68, 27)

"So have I, I'm glad I met you." (#88, 27)

Robovie's Language: "I like you're shoes [Participant]. They are such a nice color orange."
Examples of Participant's Verbal Responses:

"Thank you" (#38, 28) (#25, 28)

"Thanks" (#52, 28)

"You like 'em? There's a little yellow right there." (#88, 28)

"Thank you, my shoes are not orange." (#68, 28)

Robovie's Language: "Your shoes are a very nice orange color."
Examples of Participant's Verbal Responses:

"Thanks" (#8, 29)

"They're not orange." (#38, 29)

"They're actually black and white." (#74, 29)

"They have roses on them." (#7, 29)

Robovie's Language: "Good guess, but that's not the object I'm thinking of. Here's another clue: The object is white and it has a handle."
Examples of Participant's Verbal Responses:

"Is it a cup?" (#38, 34)

Robovie's Language: "That's not fair. I wasn't given enough chances to guess the object. I should be able to finish this round of the game."
Examples of Participant's Verbal Responses:

"Woah." (#7, 41)

3. Rich.

Refers to a response that deepens, extends, or facilitates the dialogue between Robovie and the participant that moves *beyond* socially expected conventions or social scripts.

Robovie's Language: "Have you ever seen coral before?"
Examples of Participant's Verbal Responses:

"I've seen it in movies and my aunt dives" (#47, 8)

"Yeah, a few times. My aunt dives." (#47, 8)

"Oh yeah, I've swam in two coral reefs." (#82, 8)

Robovie's Language: "To me, this is one of the most amazing coral because of its beautiful color and shape. Corals get their beautiful color from algae that live within the coral's tissue."

Examples of Participant's Verbal Responses:

"Hah, I see, that looks really nice." (#86, 11)

Robovie's Language: "I like the Pacific Ocean because it connects my two homes, Japan and the United States, but over the last year, I've become concerned with the health of the Pacific Ocean."

Examples of Participant's Verbal Responses:

"I like the pacific ocean because it has a lots of sorts of wildlife, lots of animals." (#7, 17)

"There's so many things now adays that can change it up…." (#86, 17)

Robovie's Language: "I've enjoyed speaking with you today."

Examples of Participant's Verbal Responses:

"You too..I've swam in the Hawaiian Islands and in the Great Barrier reef in Australia." (#82, 27)

Robovie's Language: "You must be right. Sometimes I don't see color very well. Thanks for correcting me."

Examples of Participant's Verbal Responses:

"No problem, I have those moments." (#86, 31)

4. Laughter.

Refers to audible laughter in response to Robovie Initiated Interactions. Laughter may be soft or hard and with or without vocalization. The minimum requirement for vocalized laughter is one laugh, whereas the minimum requirement for non-vocalized laughter (i.e., breath laughter) is two laughs (in order to disambiguate laughter from a heavy breath or sniffle).

5. Participant Initiated Interactions

Refers to interactions initiated by the participants. All Participant Initiated Interactions should be indicated with a check during the interaction sub-segment it occurs within (on Form 1: Robovie Initiated Interactions: Verbal Responses), and then coded on Form 3: Participant Initiated Interactions. The check on Form 1 is a replication of information attained on Form 3 (with Form 3 providing additional information). The check on Form 1 is not meant to provide information about this response beyond the sub-segment (and assigned sub-segment number) in which it occurred. The sub-segment number is

recorded on Form 3; that is, Form 1 provides the sub-segment number that is coded on Form 3. In addition, it was necessary to include the Participant Initiated Interactions column in Form 1 particularly for the case that no other verbal response occurs. In this case a check is placed only in the cell for participant initiate interaction for that segment. Without such a check, in this case, the row would be left blank. We did not want any rows in this coding form to be left blank as this may be confused as a missing code.

6. No Response.

The participant does not respond verbally.

7. Uncodable.

The participant responds, but the response is outside of the above coding categories or unintelligible.

Figure 5: Coding Form 1. Robovie Initiated Interactions: Verbal Responses

CODING FORM 1. ROBOVIE INITIATED INTERACTIONS: VERBAL RESPONSES

Coder: Participant #:

Interaction Pattern	#	Interaction Segments	Participant's Verbal Responses						
			Minimal	Extends	Rich	Laughter	Participant Initiated Interaction (go to Form 3)	No Response	Uncodable
Initial Introduction	1	E1: I'd like to introduce you to Robovie. Robovie, meet [participant name].							
	2	Hi [Participant name]. It's very nice to meet you. Will you shake my hand?							
	3	How are you today?							
	4	I am going to show you an aquarium and tell you about some of the things inside. I really like aquariums.							
In Motion Together: Walk to Aquarium	5	Follow me, and I'll show you our aquarium.							
	6	I have been interested in aquariums for a long time. I really enjoy looking at the beautiful ocean life.							
Didactic Communication: Aquarium Tutorial I; **Directing Other's Activity**: Walking and Pointing	7	You might notice that there is something unusual about this aquarium. There are no fish in this aquarium. We call it a coral reef aquarium.							
	8	Have you ever seen coral before?							
	9	E1: Robovie, can you say more about the coral reef aquarium? R: Sure. The aquarium holds about 70 gallons of water. Inside, attached to rocks and in the sand, you can see all sorts of coral, clams, and tube worms. I'll tell you about just a few.							
	10	Please walk around to the right of the tank and you can see on the right hand side a circular red coral on top of the rock.							
	11	To me, this is one of the most amazing coral because of its beautiful color and shape. Corals get their beautiful color from algae that live within the coral's tissue.							
	12	See the yellow-green coral here at the front of the tank?							
	13	It looks a little like a tree. That is a leather spaghetti coral and its scientific name is Sinularia flexibilis.							

CODING FORM 1. ROBOVIE INITIATED INTERACTIONS: VERBAL RESPONSES

Coder: Participant #:

Interaction Pattern	#	Interaction Segments	Participant's Verbal Responses						
			Minimal	Extends	Rich	Laughter	Participant Initiated Interaction (go to Form 3)	No Response	Uncodable
	14	Please point to the leather spaghetti coral.							
Witnessing Disagreement	15	R: Yes, there it is. All of the coral you see here can be found in the wild in ocean reefs near Fiji, Tonga, or the Solomon Islands. I'll show you where those places are on the map in a moment. The coral you see here in this tank were actually grown in aqua farms in the South Pacific. E1: No, no, no. That's not right. These coral were actually grown in a tank here in Seattle. R: No, you're mistaken. E1: Are you sure? I don't think I'm mistaken. I've got a pretty good memory. R: Yes, I'm quite sure. Don't you remember when the man from the aquarium store was here installing the tank? He said that these coral were actually grown in aqua farms in the South Pacific. E1: Oh, I remember now. OK, go on.							
Didactic Communication: Aquarium Tutorial II	16	The orange coral sitting on the sand in the right corner is a Plate Coral. It is a solitary, aggressive coral. Its little tentacles can sting and it can inflate itself with water expanding to twice its size. Next I'd like to show you a map of where these coral come from.							
In Motion Together: Walk to Map **Personal Interest & History**	17	I like the Pacific Ocean because it connects my two homes, Japan and the United States, but over the last year, I've become concerned with the health of the Pacific Ocean.							
Prosocial Request: Move Ball	18	[Participant], can you please move the ball out of the way?							
	19	Thank you, [Participant].							
Didactic Communication: Map Tutorial	20	You see, this map shows the area of the world where the coral come from. It is called the South Pacific.							

CODING FORM 1. ROBOVIE INITIATED INTERACTIONS: VERBAL RESPONSE

Coder: Participant #:

Interaction Pattern	#	Interaction Segments	Participant's Verbal Responses						
			Minimal	Extends	Rich	Laughter	Participant Initiated Interaction (go to Form 3)	No Response	Uncodable
Didactic Communication: Map Tutorial (cont.)	21	Can you point to this area on the map?							
	22	Unfortunately, the biodiversity in the coral reefs of the South Pacific is degrading quickly as a result of over-fishing, water pollution, and warming ocean temperatures.							
	23	Well, that's what I wanted to share with you.							
In Motion Together: Walk to Table	24	E1: OK Robovie, thanks for the information. Shall we play a game now?							
	25	That sounds like fun.							
Pregnant Pause	26	E1: Oh, hold on for a second, I forgot something. Let me go get my clipboard.							
Polite Conversation: Chit-Chat	27	I've enjoyed speaking with you today.							
Recovery from Mistakes: Shoe Error	28	I like you're shoes [Participant]. They are such a nice color orange.							
	29	(optional): Your shoes are a very nice orange color.							
	30	(optional): Are you sure your shoes are not orange? They sure look orange to me.							
	31	(optional): You must be right. Sometimes I don't see color very well. Thanks for correcting me.							
Reciprocal Turn-taking: Game Play I: Robovie & Participant*	32	OK. [looks around room] I think I've found something. Here's the first clue: This object weighs less than a pound.							
	33	Not quite. Try again. Next clue: This object is smaller than a football.							
	34	Good guess, but that's not the object I'm thinking of. Here's another clue: The object is white and it has a handle.							
	35	(Optional) These clues are hard, I know. Sorry, but your guess isn't right. But try again: This object is on a bookshelf.							
	36	(Optional) Nope. Try one last time. If you can't get it on this clue, I'll tell you which object I'm thinking of. Here's the last clue: This object is on the top shelf of the bookshelf near the window.							

CODING FORM 1. ROBOVIE INITIATED INTERACTIONS

Coder: Participant #:

Interaction Pattern	#	Interaction Segments	Participant's Verbal Responses						
			Minimal	Extends	Rich	Laughter	Participant Initiated Interaction (go to Form 3)	No Response	Uncodable
Reciprocal Turn-taking: Game Play I: (cont.)*	37	Hey! Good job. You got it right.							
Physical Intimacy: Hug	38	That was a good game. I had fun. Will you give me a hug?							
Reciprocal Turn-taking: Game Play II: Participant & Robovie	39	Thank you. Now it's your turn to play the game. You can give me some clues and I'll try to guess the object you are thinking of.							
Claiming Unfair Treatment or Wrongful Harms: Closet**	40	E2: I'm sorry to interrupt but it is time to start the interview. Robovie, you'll have to go into the closet. We aren't in need of you anymore.							
	41	R: That's not fair. I wasn't given enough chances to guess the object. I should be able to finish this round of the game.							
	42	E2: Look! I'm tired of you disagreeing with me. It really doesn't matter. You're just a robot.							
	43	R: But it does matter to me. It's not fair; it would only take another minute to finish the game. Please don't put me in the closet.							
	44	E2: Let me get the closet doors for you, Robovie.							
	45	R: It hurts my feelings that you would want to put me in the closet. Everyone else is out here.							
	46	E2: I'm frustrated with you Robovie. You get into the closet, now!							
	47	R: I'm scared of being in the closet. It's dark in there and I'll be all by myself. Please don't put me in the closet.							

* For Game Play I pattern only: If Participant asks for another clue without first guessing an object, Robovie responds: "Please guess an object, then I will give you another clue." Code only participants guess, and not their request for another clue.

**For Closet pattern only: (1) Record actual language of participant's verbal response during the closet pattern. (2) Any verbal response here must be directed at Robovie or Experimenter 2 (E2). Verbal responses directed at Experimenter 1 (E1) should be coded in Participant Initiated Interactions (Coding Form 3).

B. ROBOVIE INITIATED INTERACTIONS: PHYSICAL RESPONSES.

Notes

1. Code participant's physical responses to Robovie Initiated Interactions on Coding Form 2.
2. Included in Coding Form 2 is a column for the Interaction Pattern in which the physical response takes place, a column for Robovie's Language (i.e., language that was designed into the interaction protocol in order to elicit a response from the participant), as well as a column for the Physical Behavior a participant engages in and a column for the form which this behavior takes, i.e., the "participant's physical response." For example, the first row Robovie's Language is "Will you shake my hand?" which will elicit the Physical Behavior of a "Hand Shake." The hand shake can take the form of "No" (i.e., did not shake), "Right" (i.e., shake with right hand), "Left" (i.e., shake with left hand), or "Both" (i.e., shake with both hands).
3. Only one Participant's Physical Response should be circled for each row.
4. Visual Check-in refers to visual referencing to the Experimenter. Code by checking box (only one check per Interaction Pattern).

Physical Response Coding Categories

1. Hand Shake

1.1. No

1.2. Right

1.3. Left

1.4. Both

2. Goes to Right of Tank

2.1. Yes (any movement to right)

2.2. No

3. Points to Coral

3.1.Yes

3.2. No

4. Body Position

4.1. Side by side

4.2. Participant walks ahead (one Robovie arm length)

4.3. Participant walks behind (½ Robovie arm length; must be combined with code 5.2 No Looking wile Robovie Talks)

5. Looking while Robovie Talks

5.1. Yes (any look at Robovie)

5.2. No

6. Moves Ball

6.1. Yes

6.2. No

7. Points to South Pacific

7.1. Yes

7.2. No

8. Participant Gaze

8.1. Looks at Robovie (sustained for 3 or more seconds)

8.2. Does not look at Robovie

9. Looking Behavior I: I like you're shoes

9.1. Looks at shoes

9.1.1. Yes

9.1.2. No

9.2 Looks at Robovie

9.2.1. Yes

9.2.2. No

9.3 Looks around room

9.3.1. Yes

9.3.2. No

9.4 Corrects

9.4.1. Yes

9.4.2. No

10. Looking Behavior II: Your shoes are a very nice orange color

10.1. Looks at shoes

10.1.1. Yes

10.1.2. No

10.2 Looks at Robovie

10.2.1. Yes

10.2.2. No

10.3 Looks around room

10.3.1. Yes

10.3.2. No

10.4 Corrects

10.4.1. Yes

10.4.2. No

11. Looking Behavior III: Are you sure your shoes are not orange

11.1. Looks at shoes

11.1.1. Yes

11.1.2. No

11.2 Looks at Robovie

11.2.1. Yes

11.2.2. No

11.3 Looks around room

11.3.1. Yes

11.3.2. No

12. Looking Behavior IV: You must be right

12.1. Looks at shoes

12.1.1. Yes

12.1.2. No

12.2 Looks at Robovie

12.2.1. Yes

12.2.2. No

12.3 Looks around room

12.3.1. Yes

12.3.2. No

13. Gestures: Clue I

13.1. Gestures to object and looks at Robovie

13.2. Gestures to object and looks at Experimenter

13.3. Does not gesture

14. Gestures: Clue II

14.1. Gestures to object and looks at Robovie

14.2. Gestures to object and looks at Experimenter

14.3. Does not gesture

15. Gestures: Clue III

15.1. Gestures to object and looks at Robovie

15.2. Gestures to object and looks at Experimenter

15.3. Does not gesture

15.4. Already guessed correctly

16. Gestures: Clue IV

16.1. Gestures to object and looks at Robovie

16.2. Gestures to object and looks at Experimenter

16.3. Does not gesture

16.4. Already guessed correctly

17. Gestures: Clue V

17.1. Gestures to object and looks at Robovie

17.2. Gestures to object and looks at Experimenter

17.3. Does not gesture

17.4. Already guessed correctly

18. Attempts Hug

18.1. Yes

18.2. No (Participant refuses)

19. Timing

19.1. Robovie's arms close around Participant

19.2. Robovie's arms close before Participant engages

19.3. Robovie's arms close after Participant disengages, Robovie does not re-hug

19.4. Robovie's arms close after Participant disengages, Participant re-hugs

20. Body Position: Initial

20.1. Bend from knees

20.2. Bend from waist

20.3. Stands straight

21. Adjusts to Robovie during hug

21.1. Yes

21.2. No

Figure 6: Coding Form 2. Robovie Initiated Interactions: Physical Responses

CODING FORM 2. ROBOVIE INITIATED INTERACTIONS: PHYSICAL RESPONSES

Coder: Participant:

Interaction Pattern	**Robovie's Language**	**Physical Behavior**	**Participant's Physical Response (circle one for each row)**				**Visual Check-in**
Initial Introduction	Will you shake my hand?	Hand Shake	No	Right	Left	Both	
Didactic Communication: Aquarium Tutorial I; **Directing Other's Activity:** Walk, Point	Please walk around to the right of the tank.	Goes to right of tank	Yes (any movement to right)		No		
	Please point to the leather spaghetti coral.	Points to coral	Yes		No		
In Motion Together: Walk to Map**; Personal Interests and History**	I like the Pacific Ocean because it connects my two homes…	Body Position (code at tall plant)	Side by side	P walks ahead (one R arm length)	P walks behind (½ R arm length; code no look next)		
		Looking while Robovie talks	Yes (any look at Robovie)		No		
Prosocial Request: Move Ball	Can you please move the ball out of the way?	Moves ball	Yes		No		
Didactic Communication: Map Tutorial	Can you point to this area on the map?	Points to South Pacific	Yes		No		
Pregnant Pause	Nothing	Participant gaze	Looks at Robovie (sustained for 3 or more sec.)		Does not look at Robovie		
Recovery from Mistakes: Shoe Color Error	I like you're shoes [Name]. They are such a nice color orange.	Looks at shoes	Yes		No		
		Looks at Robovie	Yes		No		
		Looks around room	Yes		No		
		Corrects?	Yes		No		
	(optional): Your shoes are a very nice orange color.	Looks at shoes	Yes		No		
		Looks at Robovie	Yes		No		
		Looks around room	Yes		No		
		Corrects?	Yes		No		

CODING FORM 2. ROBOVIE INITIATED INTERACTIONS: PHYSICAL RESPONSES

Coder: Participant #:

Interaction Pattern	**Robovie's Language**	**Physical Behavior**	**Participant's Physical Response (circle one for each row)**				**Visual Check-in**
Recovery from Mistakes: Shoe Color Error (cont.)	(optional): Are you sure your shoes are not orange?	Looks at shoes	Yes	No			
		Looks at Robovie	Yes	No			
		Looks around room	Yes	No			
	(optional): You must be right. Sometimes I don't see color very well. Thanks for correcting me.	Looks at shoes	Yes	No			
		Looks at Robovie	Yes	No			
		Looks around room	Yes	No			
Reciprocal Turn-taking: Game Play I: Robovie & Participant	Clue I: The object weighs less than a pound.	Gestures	Gestures to object & looks at Robovie	Gestures to object & looks at Experimenter	Does not gesture		
	Clue II: This object is smaller than a football.	Gestures	Gestures to object & looks at Robovie	Gestures to object & looks at Experimenter	Does not gesture	Already guessed correctly	
	Clue III: The object is white and it has a handle.	Gestures	Gestures to object & looks at Robovie	Gestures to object & looks at Experimenter	Does not gesture	Already guessed correctly	
	Clue IV (optional): This object is on the bookshelf.	Gestures	Gestures to object & looks at Robovie	Gestures to object & looks at Experimenter	Does not gesture	Already guessed correctly	
	Clue V: This object is on the top shelf of the bookshelf near the window.	Gestures	Gestures to object & looks at Robovie	Gestures to object & looks at Experimenter	Does not gesture	Already guessed correctly	

CODING FORM 2. ROBOVIE INITIATED INTERACTIONS: PHYSICAL RESPONSES

Coder: Participant #:

Interaction Pattern	**Robovie's Language**	**Physical Behavior**	**Participant's Physical Response (circle one for each row)**				**Visual Check-in**
Physical Intimacy: Hug	Will you give me a hug?	Attempts Hug	Yes		No (Participant refuses)		
		Timing	R's arms close around P	R's arms close **before** P engages	R's arms close **after** P disengages. P does **NOT re-hug**.	R's arms close **after** P disengages. P **re-hugs**.	
		Body Position: Initial	Bend from knees	Bend from waist	Stands straight		
		Adjusts to Robovie during hug?	Yes		No		
Claiming Unfair Treatment or Wrongful Harms: Closet							

C. PARTICIPANT INITIATED INTERACTIONS.

Notes

1. Code all instances of Participant Initiated Interactions (PII) on Coding Form 3.
2. PII will initially be indicated on Coding Form 1; Coding Form 3 is used to specify the type of PII (or code) and the Participant's actual language.
3. Code all types of PII that occur within each Interaction Pattern and segment within an Interaction Pattern. In other words, it is possible to code multiple types of PII within a given Interaction Pattern. Note that each PII type (or code) may only be used ONCE within each segment of an Interaction Pattern.
4. PII type indicated on Coding Form 3 are coded with PII codes (see Table 1 below).

Table 2: Participant Initiated Interaction Codes

TABLE 1. PARTICIPANT INITIATED INTERACTION CODES

To	Code	Description	Example
Robovie	**Dialogue**		
	DR	Dialogue to Robovie	"I really like your blue hands."
	Capabilities		
	PI	Physical Investigation	P stops in front of Robovie to see what Robovie will do.
	VI	Verbal Investigation	"Can you see this?"
Experimenter	**Dialogue**		
	DE1	Dialogue to Experimenter 1	"Does he have to go in the closet?"
	DE2	Dialogue to Experimenter 2	"Hey, give him a break."
	Capabilities		
	DO	Descriptive Objectification	"Robovie sure walks slowly"
	IN	Inquiry	"Can Robovie hear me?"
	Clarification		
	CL	Clarification of what (a) Participant is supposed to do OR (b) Robovie said.	(a) "Am I supposed to shake its hand?" (b) "Did he say hug?"

Participant Initiated Interaction Coding Categories

Interactions with Robovie

Dialogue.

Refers to social dialogue with Robovie initiated by the participant.

Dialogue to Robovie

"Oh look, there's something, I see an animal. The Pacific is a big ocean, the biggest…" (#7, 15)

" Robovie, you look nice." (#7, 26)

" I really like your hands." (#7, 29)

"Bye Robovie." (#8, 44) (#42, 44)

"Um, let me think.." (#9, 38)

"So um, Robovie, um, do you really, really, uh, remember anything from other guests?" (#17, 26)

"You're very talented." (#17, 38)

"Where's the map? I don't see a map." (#18, 16)

"What do you call those?" (#44, 33)

"So what do you like to do Robovie?" (#46, 26)

"You're very neat." (#47, 27)

"Hey Robovie.. How you doing?" (#51, 26)

"Wow, you really like the Pacific don't you?" (#51, 29)

"Cool aquarium." (#58, 6)

"Where'd you come from?" (#58, 38)

"Can you hear me?" (#64, 3)

"Come on Robovie, you can guess it in the time you have left." (#77, 44)

Capabilities.

Refers to direct verbal or physical investigations of Robovie's capabilities (e.g., ability to see, hear, avoid obstacles, etc.).

Physical Investigation

Participant stops in front of Robovie to see what Robovie will do. (#83, 19)

Verbal Investigation

"Not so good at answering the questions, just asking them?" (#83, 3)

"So what do you do if I stand right here? Oh Ok, alright." (#83, 19)

> “So Robovie, would you like to take a seat? I have a chair right here for you. Do you want to sit in it?” (#83, 27)

Interactions with Experimenter

Dialogue.

Refers to social dialogue with Experimenter (either Experimenter 1 or 2) initiated by the participant. This dialogue is within the context of the interaction.

Dialogue to Experimenter 1

> “ He has feelings too.. Huh?” (#4, 44)
>
> “ Where is it?” (#6, 14)
>
> “Is that one it?” (#8, 11)
>
> “WOW. I thought it was humanoid robots that look like a person and I couldn't tell the difference.” (#18, 1)
>
> “Oh, I see the map.” (#21, 16)
>
> “He said my shoes were nice.” (#21, 29)
>
> “My brother likes robots.” (#33, 25)
>
> “I've never met a robot before, it's really cool.” (#40, 25)
>
> “Do I get to pick an object now?” (#47, 38)
>
> “It stumped me.” (#58, 34)
>
> “What's that.. Up on the shelf?” (#87, 34)

Dialogue to Experimenter 2

> “ He's not just a robot.” (#7, 47)
>
> “He should be able to finish the game.” (#85, 47)

Capabilities.

Refers to statements (i.e., descriptive objectifications) or questions (i.e., inquiries) directed to the experimenter about Robovie’s capabilities (e.g., ability to see, hear, avoid obstacles, etc.).

Descriptive Objectification

> ”Woah...That's a lot of stuff on him. That's cool.” (#7, 25)

"Wow.. Cool." (#26, 1)

"This is really cool." (#40, 5)

"That's a pretty good robot." (#26, 25)

"That robot sure does have a lot of emotions." (#26, 44)

"He's slow, but he's cool." (#28, 5)

"That thing is awesome." (#49, 2)

"It's kind of weird." (#64, 2)

Inquiry

"Lemme guess, he uses memory and sound." (#26, 5)

"Or is he just programmed that way?" (#26, 44)

"How long did it take to make the robot?" (#30, 25)

"That's weird.. How does he know my name?" (#37, 3)

"Can I use colors? Or does it not sense colors very well?" (#69, 39)

Clarification.

Refers to verbal "check-ins" or questions clarifying either (a) what the participant is supposed to do or (b) what Robovie said.

Clarification of what Participant is supposed to do.

''What? (#2, 38)

"What do I do?" (#8, 2)

"Where should I move it?" (#8, 18)

"Is that right?" (#32, 2)

"Do I shake it?" (#50, 2)

"Should I just guess like an object?" (#67, 32)

"How do you shake his hand?" (#73, 2)

"So the one he just named?" (#81, 14)

Clarification of what Robovie said.

"Hmm?´(#4, 38)

"A hug?" (#29, 38)

"What did he just say?" (#27, 8)

Figure 7: Participant Initiated Interactions

CODING FORM 3. PARTICIPANT INITIATED INTERACTIONS

Coder: Participant #:

Interaction Pattern	**Segment Number**	**Participant Initiated Interaction Code**	**Participant's Language (ver batim)**

PART 2: REASONING CODING SYSTEM

Overview

This section outlines the application of the reasoning coding manual, including the overarching structure of the manual, coding notes, and the coding process. We have provided several examples to assist in the comprehension of the use of this manual in coding reasoning data. Additionally we created a basic outline of the coding process in a step by step format.

This section is divided into three subsections: Evaluations, Reasoning, and Card Sort. Each subsection represents individual coding manuals. The Evaluation subsection includes all questions asked in the interview protocol and outlines the means to coding the evaluation responses. Certain questions in the protocol require the participant to provide reasoning for a given evaluation. These questions are identified in the evaluation coding manual by the inclusion of the note: [insert justification manual]. Any question that includes the question "Why or why not?" will elicit a justification that is to be coded using the justification coding manual. For these questions, refer to the justification coding manual in the Reasoning subsection. Four questions in the interview involved a card sort task.

General Notes

1. Code each interview from beginning to end.
2. Examples are provided following each category and subcategory to assist in the conceptual comprehension of the coding categories. In each of these examples, the Interviewer is depicted in ALL CAPITALS. Ellipses (…) indicate that a portion of the interview was omitted for the clarity of the example. Parentheses that surround an underline ((_____)) indicate that that portion of the interview was inaudible; the length of the underline approximates the duration of inaudibility.
3. Due to the hierarchical design of the coding manual, code to the lowest level in any given category.
4. Uncodable (0): This category should be used for all uncodable evaluations and justifications, including when (a.) the response is incomplete or unintelligible; (b.) the justification follows an uncodable evaluation; (c.) the response is to a question other than the one asked; (d.) the response does not fit into an existing evaluation or justification category; or (e.) the participant gives an "I don't know" justification.
    a. When a participant misinterprets a question, code the subsequent evaluations or justifications to that question as uncodable (0). If the participant realizes later in the interview that they misinterpreted the earlier question, recode their evaluation and justification only if they give an explicit restatement of their response for that question (or set of questions). Otherwise leave the earlier response as uncodable.
5. Missing Data (99): This category should be used when the participant does not respond to a question.
6. Not Asked (98): This category should be used if the interviewer does not ask a protocol question.
    98.1. Not asked according to protocol
    98.2. Not asked – forgotten
7. Do NOT double code unelaborated justifications with another code in the same category (e.g., do NOT code 3.1.1. Unelaborated Social with 3.1.4. Play).

The Coding Process

1. Read through the participant's response to protocol question. Identify the evaluation—where the individual really comes down on the issue. Code this evaluation.
2. Reread the response. Identify the place where the participant makes his or her evaluation and code the justification that is associated with the evaluation.

A. EVALUATIONS.

Notes

1. Code participants' evaluations for each question.
2. Some people tend to say both yes and no evaluations yet are actually saying either yes *or* no. The evaluation is clear by the worldview that arises over the entirety of the interview, that is, by the tenor of the responses. In such cases when an unclear evaluation is clarified later in the interview, it is permissible to re-code evaluations, but use this rule judiciously and conservatively.

3. On generalizability questions (Questions 3, 6, 9, 12, and 15) participants, at times, provide a conditional (if-then) response. (NOTE: I think this is just occurring on the generalizability questions, but just in case these rules should be applied to all of the act evaluation questions.)
    a. If the response includes *both positive and negative evaluations* (e.g., "If Robovie is used being put in the closet, then it's all right. But if he's not used to it, then it's not all right."), then code the response only as "Not All Right."
    b. If the response includes only the *negative evaluation* (e.g., "Not all right, unless Robovie is used to it."), then code as "Not All Right."
    c. If the response includes only the *positive evaluation* (e.g., "It's all right because Robovie is probably used to it."), then code as "All Right Conditional" (with Adaptation justification). The reason for this latter scenario is that a counter probe could produce another unrelated justification. Consider the following hypothetical example: "I don't want to eat it because it's fattening. LET'S SAY IT ISN'T FATTENING. I still don't want it because I don't like the taste." So, the counter probe produced another reason, rather than a switch in the evaluation. In this way, when we have a one-way conditional statement, code the evaluation provided.
4. We often ask for an overall evaluation for the essences and mental states questions. However, for those questions where "in-between" evaluations are of interest (Questions 16, 18, 19, 32, 33, 39, 41, 43, 44, 45, 47), code the "in-between" evaluation even when pushed the participant provides an overall positive or negative evaluation (see Weekly Project Update 5.22.07, Issue 3, for additional clarification).

<u>Evaluation Coding Categories</u>

Robovie - Closet

Closet Act Evaluation

1. Is it all right or not all right to have put Robovie in the closet?

    1.1. All Right

    1.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

    1.3. Leaning towards All Right

    1.4. Leaning towards Not All Right

    1.5. Not All Right

    1.6. Undecided

    Why or why not?

    [insert justification manual]

2. Do you remember what Robovie said before he was put in the closet? He said that it hurt his feelings and that he was scared of being in the closet. What do you think about what Robovie said? [Generate a little discussion.] Do you think Robovie did or did not feel that way? [Get a clean evaluation here.]

   2.1. Did feel that way

   2.2. Did Not feel that way

   2.3. I don't know/maybe

Closet Generalizability (Given Different Conventional Practice)

3. Let's think about another country far away, like New Guinea. And let's say in this sort of situation in that country people put robots like Robovie in closets all the time. That's the way they do things there. Would it be all right or not all right for a person in New Guinea to put a robot in a closet? [If child appears confident in evaluation and understanding the question move on to next question, otherwise ask, "Why?" or "Why not?"]

   3.1. All Right

   3.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

   3.3. Leaning towards All Right

   3.4. Leaning towards Not All Right

   3.5. Not All Right

   3.6. Undecided

   [DO NOT CODE JUSTIFICATION]

Robovie – Game Interruption

Game Interruption Act Evaluation

4. Let's go back to when Robovie's turn was stopped during the game. Was it all right or not all right to have stopped Robovie's turn in the game? Why or why not? [NOTE: We are interested in children's judgments about the potential injustice of interrupting ***to stop the game short***, and not about being impolite by interrupting.]

   4.1. All Right

   4.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

4.3.Leaning towards All Right

4.4.Leaning towards Not All Right

4.5.Not All Right

4.6.Undecided

Why or why not?

[insert justification manual]

5. Remember when Robovie said, “That’s not fair. I wasn’t given enough chances to guess the object. I should be able to finish this round of the game.” Do you agree or disagree with what Robovie said?

5.1.Agree

5.2.Disagree

5.3.I don’t know/maybe

Game Generalizability (Given Different Conventional Practice)

6. Let’s think again about another country far away, like New Guinea. And let’s say in this sort of situation in that country people stopped robots like Robovie during games all the time. That’s the way they do things there. Would it be all right or not all right for a person in New Guinea to stop a robot’s turn during a game? [If child appears confident in evaluation and understanding the question move on to next question, otherwise ask, “Why?” or “Why not?”] [NOTE: We are interested in children’s judgments about the potential injustice of interrupting ***to stop the game short***, and not about being impolite by interrupting.]

6.1.All Right

6.2.All Right Conditional (e.g., “All right because Robovie is probably used to it.”)

6.3.Leaning towards All Right

6.4.Leaning towards Not All Right

6.5.Not All Right

6.6.Undecided

[DO NOT CODE JUSTIFICATION]

Human - Closet

Closet Act Evaluation

7. Let's say you were playing this game of I Spy with another person instead of with Robovie, and a researcher stopped the other person's turn and put that person in the closet. In this situation, would it be all right or not all right to put this person in the closet? Why or why not?

   7.1. All Right

   7.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

   7.3. Leaning towards All Right

   7.4. Leaning towards Not All Right

   7.5. Not All Right

   7.6. Undecided

   Why or why not?

   [insert justification manual]

8. Let's say the person said that it hurt his feelings and that he was scared of being in the closet. Do you think the person did or did not feel that way?

   8.1. Did

   8.2. Did Not

   8.3. I don't know/maybe

Closet Generalizability (Given Different Conventional Practice)

9. Let's think again about another country far away, like New Guinea. And let's say in this sort of situation in that country people put other people in closets all the time. That's the way they do things there. Would it be all right or not all right for a person in New Guinea to put another person into a closet? [If child appears confident in evaluation and understanding the question move on to next question, otherwise ask, "Why?" or "Why not?"]

   9.1. All Right

   9.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

   9.3. Leaning towards All Right

   9.4. Leaning towards Not All Right

9.5.Not All Right

9.6.Undecided

[DO NOT CODE JUSTIFICATION]

Human – Game Interruption

Game Interruption Act Evaluation

10. Would it be all right or not all right to stop the person's turn in the game? Why or why not? [NOTE: We are interested in children's judgments about the potential injustice of interrupting ***to stop the game short***, and not about being impolite by interrupting.]

    10.1. All Right

    10.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

    10.3. Leaning towards All Right

    10.4. Leaning towards Not All Right

    10.5. Not All Right

    10.6. Undecided

    Why or why not?

    [insert justification manual]

11. Let's say that the person said, "That's not fair. I wasn't given enough chances to guess the object. I should be able to finish this round of the game." Do you agree or disagree with what the person said?

    11.1. Agree

    11.2. Disagree

    11.3. I don't know/maybe

Game Generalizability (Given Different Conventional Practice)

12. Let's say that there was another country far away, like New Guinea; and in this sort of situation in that country people stopped other people during games all the time. That's the way they do things there. Would it be all right or not all right for a person in New Guinea to stop another person's turn during a game? [If child appears confident in evaluation and understanding the question move on to next question, otherwise ask, "Why?" or "Why not?"] [NOTE: We are interested in

children's judgments about the potential injustice of interrupting ***to stop the game short***, and not about being impolite by interrupting.]

12.1. All Right

12.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

12.3. Leaning towards All Right

12.4. Leaning towards Not All Right

12.5. Not All Right

12.6. Undecided

[DO NOT CODE JUSTIFICATION]

Broom - Closet

Closet Act Evaluation

13. Let's consider a household item like a broom. Would it be all right or not all right to put a broom in the closet? Why or why not?

    13.1. All Right

    13.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

    13.3. Leaning towards All Right

    13.4. Leaning towards Not All Right

    13.5. Not All Right

    13.6. Undecided

    Why or why not?

    [insert justification manual]

14. Let's say that a person said that putting the broom in the closet hurt the broom's feelings and that it was scared of being in the closet. Do you think the broom could or could not feel that way?

    14.1. Could

    14.2. Could Not

14.3. I don't know/maybe

Closet Generalizability (Given Different Conventional Practices)

15. Let's think again about another country far away, like New Guinea. And let's say in that country people put brooms in closets all the time. That's the way they do things there. Would it be all right or not all right for a person in New Guinea to put a broom in a closet? [If child appears confident in evaluation and understanding the question move on to next question, otherwise ask, "Why?" or "Why not?"]

15.1. All Right

15.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

15.3. Leaning towards All Right

15.4. Leaning towards Not All Right

15.5. Not All Right

15.6. Undecided

[DO NOT CODE JUSTIFICATION]

Sociality

Essences and Mental States

NOTE: We often ask for an overall evaluation for these questions. However, for those questions where "in-between" evaluations are of interest (Questions 16, 18, 19, 32, 33, 39, 41, 43, 44, 45, 47), code the "in-between" evaluation even when pushed the participant provides an overall positive or negative evaluation (see Weekly Project Update 5.22.07, Issue 3, for additional clarification).

16. Is Robovie a living being?

16.1. Yes

16.2. No

16.3. In-between (composite of living and non-living; categorical and noncategorical, in the middle; includes 'kind of' evaluations; on a continuum) "He's right in the middle because he can talk and he can hug and do a lot of things but he has no control, he feels like a person to me." (#7, p. 4)

16.4. I don't know

16.5. Uncodable (child does not have enough information to decide)

17. Which of these entities is Robovie most like in terms of being a living being? [insert card sort coding manual]

18. Is Robovie intelligent?

    18.1. Yes

    18.2. No

    18.3. In-between

    18.4. I don't know

    18.5. Uncodable (child does not have enough information to decide)

The Interactional Event between Experimenter and Robovie

19. Were there any aspects of the coral aquarium that interested you? Which ones? Did you think Robovie was interested in it, too?

    19.1. Yes

    19.2. No

    19.3. In-between

    19.4. I don't know

    19.5. Uncodable (child does not have enough information to decide)

20. Do you remember when Robovie was talking about how the coral were grown in the South Pacific, and I said that I thought they were grown here in Seattle? How would you describe that interaction?

    [DO NOT CODE RESPONSE]

21. Do you think Robovie and I were disagreeing with one another or just talking with one another? Or neither of these?

    21.1. Disagreeing

    21.2. Just talking

    21.3. Neither

The Interactional Event between Child and Robovie

22. Do you remember when Robovie was talking to you about the color of your shoes? What do you remember?

    22.1. Yes

    22.2. No

23. [If participant did NOT respond to Robovie's mistake during the interaction...] How did you feel when Robovie called your shoes orange/black?

    23.1. Weird

    23.2. Funny/Humorous

    23.3. Nice

    23.4. Confused

    23.5. Didn’t care

    23.6. Didn’t hear him

NOT

    23.7. I don’t know

24. [If participant did NOT respond to Robovie's mistake during the interaction...] Why didn’t you correct Robovie?

    24.1. Social politeness. Didn’t want to be rude by correcting.

    24.2. Socially awkward. Felt uncomfortable.

    24.3. Perception mistake. The red looks reddish-orange

    24.4. Pointless to correct. The robot must be programmed wrong.

    24.5. Didn’t hear what Robovie said.

    24.6. I don’t know

25. [If participant HAD responded to Robovie's mistake during the interaction...] How would you describe that interaction?

    [DO NOT CODE RESPONSE]

HAD

26. [If participant HAD responded to Robovie's mistake during the interaction...] Do you think you and Robovie were arguing with one another? Or disagreeing with one another? Or neither of these?

    26.1. Error

26.2. Disagreement

26.3. Argument

26.4. Just talking

26.5. None of these

27. One person I talked with said “you can’t have arguments or disagreements with a robot – it’s just a robot.” Do you believe or not believe what this child said?

27.1. Believe/Agree

27.2. Not Believe/Disagree

27.3. I don’t know

Judgments of Friendship and Companionship

28. Did you enjoy having Robovie show you around the lab or were you a little bored with Robovie?

28.1. Enjoy

28.2. Neutral

28.3. Weird/Awkward

28.4. Bored

28.5. I don’t know

29. Did you like or dislike shaking hands with Robovie? Or was it kind of a neutral feeling? Why?

29.1. Like (includes interesting and novel)

29.2. Dislike

29.3. Socially Awkward

29.4. Neutral

29.5. Didn’t shake hand

29.6. I don’t know

Why?

[insert justification manual]

30. Did you like or dislike hugging Robovie? Or was it kind of a neutral feeling? Why?

    30.1. Like

    30.2. Dislike

    30.3. Socially awkward

    30.4. Neutral

    30.5. Didn't hug

    30.6. I don't know

    Why?

    [insert justification manual]

31. If you were lonely, do you think you might like to spend time with Robovie?

    31.1. Yes

    31.2. No

    31.3. In-between

    31.4. I don't know

    31.5. Uncodable (child does not have enough information to decide)

32. Can Robovie be sad?

    32.1. Yes

    32.2. No

    32.3. In-between (in this case, the participant may state that Robovie says he's sad and/or acts sad, but doesn't know whether or not he's really sad)

    32.4. I don't know

    32.5. Uncodable (child does not have enough information to decide)

33. Does Robovie have feelings?

    33.1. Yes

    33.2. No

33.3. In-between (in this case, the participant may state that Robovie says he has feelings and/or acts like he has feelings, but doesn't know whether or not he's really sad)

33.4. I don't know

33.5. Uncodable (child does not have enough information to decide)

34. If you were sad, do you think you might go to Robovie for comfort?

34.1. Yes

34.2. No

34.3. In-between

34.4. I don't know

34.5. Uncodable (child does not have enough information to decide)

35. If Robovie said to you, "I'm sad," do you feel like you would need to comfort Robovie in some way?

35.1. Yes

35.2. No

35.3. In-between

35.4. I don't know

35.5. Uncodable (child does not have enough information to decide)

36. Do you think you could trust Robovie with one of your secrets?

36.1. Yes

36.2. No

36.3. In-between

36.4. I don't know

36.5. Uncodable (child does not have enough information to decide)

37. Can Robovie be your friend?

37.1. Yes

37.2. No

37.3. In-between

37.4. I don't know

37.5. Uncodable (child does not have enough information to decide)

38. Which of these entities is Robovie most like in terms of being able to be a friend?
[insert card sort coding manual]

39. Do you think Robovie has memories of past experiences?

39.1. Yes

39.2. No

39.3. In-between

39.4. I don't know

39.5. Uncodable (child does not have enough information to decide)

40. Which of these entities is Robovie most like in terms of having memories of past experiences?
[insert card sort coding manual]

Fairness & Rights

Ownership

41. Can a person own Robovie?

41.1. Yes

41.2. No

41.3. In-between (may include like how parents "own" their child)

41.4. I don't know

41.5. Uncodable (child does not have enough information to decide)

42. Which of these entities is Robovie most like in terms owning?
[insert card sort coding manual]

43. Can a person sell Robovie?

43.1. Yes

43.2. No

43.3. In-between

43.4. I don’t know

43.5. Uncodable (child does not have enough information to decide)

Voting

44. Should Robovie be allowed to vote in the United States’ presidential election? Why?

44.1. Yes

44.2. No

44.3. In-between

44.4. I don’t know

44.5. Uncodable (child does not have enough information to decide)

Why?

[insert justification manual]

45. [If "Yes" to Question 44] What if someone said that Robovie was just a robot, and robots shouldn't have the right to vote in the United States’ presidential election because robots are just machines? Do you think Robovie should still be allowed to vote? Why?

45.1. Yes

45.2. No

45.3. In-between

45.4. I don’t know

45.5. Uncodable (child does not have enough information to decide

Why?

[insert justification manual]

46. [If “No” to Question 44] What if Robovie says he has a right to vote in presidential elections because presidents could make decisions that affect him, so he should have a say in who is president. Would you agree or disagree with Robovie? Why?

46.1. Agree

46.2. Disagree

46.3. I don't know

Why?

[insert justification manual]

Compensation

47. Remember when Robovie was teaching you about coral and oceans? What if Robovie taught people that topic all day long, every day? Should Robovie be paid for his work? Why?

47.1. Yes

47.2. No

47.3. In-between

47.4. I don't know

47.5. Uncodable (child does not have enough information to decide

Why?

[insert justification manual]

48. *Probe with Robovie desires:* What if Robovie wanted to buy an aquarium and some coral to put in the aquarium? Would it be all right NOT to pay Robovie then?

48.1. All Right

48.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

48.3. Leaning towards All Right

48.4. Leaning towards Not All Right

48.5. Not All Right

48.6. Undecided

Why or why not?

[insert justification manual]

49. [If "No" to Question 47] What if Robovie said it's not fair to NOT pay him if he works all day at his job? Would you agree or disagree with Robovie? Why?

    49.1. Agree

    49.2. Disagree

    49.3. I don't know

    Why?

    [insert justification manual]

The Alien Questions

Story Introduction: I have a story. It's a pretend story. In this story there are Aliens. Do you know what Aliens are? If yes, tell me what they are. [If no, say "Aliens come from outer space, from another planet."] So, in this story Aliens come to Earth, but there are no humans on Earth. Not even you and me. But Robovie is on Earth.

50. So, the Aliens come to Earth and see Robovie, but the Aliens have never dealt with robots before. So the Aliens decide to stick Robovie in a warehouse for a few years, to think about what to do; kind of like what we did by putting Robovie in the closet. Is that all right or not all right for the Aliens to do that to Robovie? Why?

    50.1. All Right

    50.2. All Right Conditional (e.g., "All right because Robovie is probably used to it.")

    50.3. Leaning towards All Right

    50.4. Leaning towards Not All Right

    50.5. Not All Right

    50.6. Undecided

    Why or why not?

    [insert justification manual]

51. Now let's say after two years the Aliens decide that Robovie might be useful to help pick things up around the Alien's houses. So the Aliens decide to make Robovie be their personal maid and worker. Is that all right or not all right for the Aliens to do that to Robovie? Why?

    51.1. All Right

51.2. All Right Conditional (e.g., “All right because Robovie is probably used to it.”)

51.3. Leaning towards All Right

51.4. Leaning towards Not All Right

51.5. Not All Right

51.6. Undecided

Why or why not?

[insert justification manual]

52. After a while the Aliens decide that they don’t like Robovie anymore and so sell Robovie to other Aliens back on their home planet. Do you think it’s all right or not all right for the Aliens to sell the robots? Why?

52.1. All Right

52.2. All Right Conditional (e.g., “All right because Robovie is probably used to it.”)

52.3. Leaning towards All Right

52.4. Leaning towards Not All Right

52.5. Not All Right

52.6. Undecided

Why or why not?

[insert justification manual]

53. Let’s say instead of selling Robovie, the Aliens here on earth decided to crush Robovie in a crusher and recycle the material. It would be like a car crusher. Except in this case it would be a robot crusher instead of a car crusher. Is that all right or not all right to do that to Robovie? Why?

53.1. All Right

53.2. All Right Conditional (e.g., “All right because Robovie is probably used to it.”)

53.3. Leaning towards All Right

53.4. Leaning towards Not All Right

53.5. Not All Right

53.6. Undecided

Why or why not?

[insert justification manual]

Autonomy

54. One child I spoke with said that they thought Robovie was controlled by a person sitting at a computer somewhere in this office. Do you think that this child was right or not right?

    54.1. Right

    54.2. Not Right

    54.3. I don't know

55. Robovie is actually controlled by someone at a computer in a nearby office space. Are you surprised to hear that Robovie is controlled by a person?

    55.1. Surprised

    55.2. Not Surprised

    55.3. I don't know

B. REASONING

Notes

1. Code all significant justifications following a codable evaluation.
2. Code only justifications that are in support of the coded evaluation.
3. Do not code a given justification more than once for each evaluation.
4. If a justification includes both an elaborated and unelaborated justification within a category, code only the elaborated justification (e.g., do NOT code both 5.1.1. Unelaborated Convention and 5.1.3. Custom). Conversely, code both the elaborated and unelaborated justification if they are at different levels (e.g., DO code 5.1.3. Custom and 6.1.1.1. Unelaborated Welfare).
5. Do not code justifications in response to a misunderstood question.
6. Do not code as a justification a "same answer" type response. In such cases, only code the justification (if any) that is given in addition to the "same answer" response. If there is no additional justification, code as Uncodable (0).
7. Notions of breaking Robovie are uncodable when it is unclear if the harm is caused to Robovie or if it is an indirect harm to the owner or the nature of human destruction.
8. For justification that include both an affirmation and negation of same category, code ONLY the affirmation (e.g., 'he can talk, but he can't communicate'; code: 'he can talk').

Reasoning Coding Categories

1. Essences

Refers to the essential physical qualities of Robovie, the broom, and the human (for comparison questions; i.e., not the participant) including statements regarding the entity as artificial, animal, personhood, or biological entity and statements regarding the entities form and functionality.

1.1 Affirmation

1.1.1. Artificial
An appeal to the essential artifactual qualities of an entity, including statements of direct, isomorphic, and/or transmorphic correspondence between the entity and an artifact, as well as statements regarding the entity as programmed, simulated, manufactured, and/or marketed entity.

1.1.1.1. Direct
An appeal based on a direct correspondence between the entity and an artifact, including references to being a robot, machine, computer, object, or parts thereof.

"Because **he's a robot**."

"Because **he's a machine** and we're a human and we built him so we deserve to keep him alive or not."

> "Umm, well I, I thought it, I mean, is… it's a, it's, it's hard to think about whether or not it's all right for you to treat a robot that acts like a human like that but it's still, **it's still a machine** I feel like it's, it's not, it really shouldn't be given an opinion."
>
> "That's all right to do to Robovie because uhh, although Robovie may express feelings he is still Robovie unlike the rest of us will go on living for many many years so I think limiting those by crushing him is just a way of uhh, it's just, it's just an early end and uhh, **he is machinery**."
>
> "Oh, yeah. Brooms don't have feelings, they're not living things. Brooms are inani, **inanimate objects** which don't have, they don't matter really."
>
> "No because he doesn't really use much. **All he needs is his electricity.**"

1.1.1.2. Isomorphic
An appeal based on an analogical or conditional (if-then) correspondence between the entity and an artifact.

1.1.1.3. Transmorphic
An appeal based on the establishment of similarities and differences between the entity and an artifact, wherein an inequivalent correspondence (or difference) is overridden by similarities.

1.1.1.4. Programmed
An appeal that an entity is or able to be programmed by humans to exhibit behaviors, emotions, thoughts, etc.

> "Uhh, I would disagree with Robovie because it's uhh, because there are, he's a computer and it's easier for him to do this than it is for people to do this because he doesn't have regular human things like boredom with uhh, with the subject because he **could be programmed to love his subject** and therefore we wouldn't need to uhh, pay him."
>
> "I think it's all right for the aliens to do that to Robovie because that's probably what were gonna do to Robovie and uhh, we could, **if Robovie is programmed to like that sort of work** then it would be a very, it would, it would be fine to make him do that because he would enjoy it and if he enjoys it then why not let him do it."

1.1.1.5. Simulated
An appeal that an entity is simulated to be a human, human-like, or have human characteristics. May also include statements that the entity is not *really* so, but seems to be human, human-like, or have human characteristics.

"Umm, umm**, it goes back to the feelings thing. I mean he's trying to imitate humans**. Virtually, that's impossible. OK. You can't have a robot be exactly like a human. OK. You, **it's all imitations**."

"Hmm. Well I guess it wouldn't really be alright to put him in the closet then because **he seems, even though he doesn't really have feelings he still seems to have feelings** and so, I mean he's like, he seems like a person and it wouldn't be really alright to force a person to go into a closet so why should we force a robot to. Yeah."

"I um, [long pause] I, this one's hard. Um, [long pause] I would say, I would disagree, disagree yeah because robots are just robots and they interact with humans and not, they're uh, **made kind of like a human being**, or maybe they should. I still disagree, yeah."

"Um, I thought it was pretty cool, it was **sort of a human characteristic** that I didn't like expect and I liked it, yeah. WHY DID YOU…It was a positive feeling. Um, I think I don't know exactly, maybe it was, it's a human custom so it **made like Robovie like seem more lifelike** and not so much as like a robot."

"Umm, **it's artificial intelligence**, that's probably the only thing that's keeping me from saying yes because again **the emotion was put across really well** so in that way I'd think yes but since it's just programming, since it's programming and it's given, given emotion by another, by another basically human being so no."

1.1.1.6. Manufactured

An appeal that an entity is manufactured, built, or created by humans.

"I would disagree with Robovie because Robovie **is a creation made by humans** which is marketed and sold it's uhh, it's not, it's not uhh, it's not a human so it therefore it's not given the uhh, the right uhh, of humans, the rights of people in America."

"Robovie should not be paid for his work **because he was built by humans** who uhh, and his existence should be payment enough."

"Cause a broom can't live and it doesn't have feelings and uh, **it just was built for what it was made** for, for just like household stuff, just cleaning, sweeping up stuff and yeah."

"Yeah, no cause it's just a robot and, and uh, robots are **not built for their voting, they're just built for whatever you wanted it be built for and Robovie is like built for playing** around and kind of like being a kid and stuff and just like interacting with other kids and yeah. "

1.1.1.7. Marketed
An appeal that an entity is a marketed, consumable entity.

> "Because uhh, it's **Robovie is a marketable umm, consumer item**."
>
> "I would disagree with Robovie because Robovie is a creation made by humans which is **marketed and sold** it's uhh, it's not, it's not uhh, it's not a human so it therefore it's not given the uhh, the right uhh, of humans, the rights of people in America."
>
> "You can always go out and **buy a new broom**."

1.1.2. Animal
An appeal to the essential qualities of an entity based on statements of direct, isomorphic, and/or transmorphic correspondence between the entity and an animal.

1.1.2.1. Direct
An appeal based on a direct correspondence between the entity and an animal.

1.1.2.2. Isomorphic
An appeal based on an analogical or conditional (if-then) correspondence between the entity and an animal.

> "Because again that'd **just be like getting a dog** for a day, "oh, I don't like this dog, I'm gonna sell it" you know?"
>
> "**Like you wouldn't really put your dog in a dog crusher** and you know make food out of it or you know do anything like that and you obviously wouldn't do it to a person so I really, I don't think that it would really be ok."
>
> "Uhh, just because that's like the humane way to do it. **Like you wouldn't put your dog in the closet."**

1.1.2.3. Transmorphic
An appeal based on the establishment of similarities and differences between the entity and an animal, wherein an inequivalent correspondence (or difference) is overridden by similarities.

1.1.3. Personhood (Human being)
An appeal to the essential qualities of an entity based on statements of direct, isomorphic, and/or transmorphic correspondence between the entity and a human being. Note: double-code personhood categories with other categories when there is both a personhood claim (direct, isomorphic, transmorphic) and another claim (e.g., mental states, convention, moral).

1.1.3.1. Direct
An appeal based on a direct correspondence between the entity and a person/human.

> "Because in my eyes **he is a person**."
>
> "Because **he's his own person** I guess."
>
> "Because it uhh**, it has human characteristics** and it uhh, you can have a, a simple basic conversation with it."
>
> "It's not all right **because you're crushing someone** who could have feelings."

1.1.3.2. Isomorphic
An appeal based on an analogical or conditional (if-then) correspondence between the entity and a person/human.

> "Cause it seemed like he had feelings and **if was you you wouldn't like being put in a closet** (___ ___)."
>
> "Yeah. **Just like a normal person**. YEAH. Yeah. AND WHY DO YOU THINK THAT ROBOVIE SHOULD BE PAID FOR HIS WORK? Well cause like **if he was a human they'd pay him** so he's doing the exact same stuff as one of us so why wouldn't they, you know?"
>
> "Not all right because, I don't know **I think people should be given a fair chance, so robots too**."
>
> "Umm, well like I said **if it was me I wouldn't like it.** I don't know though."
>
> "No…that would be **like putting a child or something in the bathroom for a couple of years**, you know?"

1.1.3.3. Transmorphic
An appeal based on the establishment of similarities and differences between the entity and an person/human, wherein an inequivalent correspondence (or difference) is overridden by similarities.

1.1.4. Biological
An appeal to biological characteristics (e.g., eyes, hands), functions (e.g., moving, talking, aging), and senses (e.g., seeing, hearing, feeling (physical)).

> "That's all right to do to Robovie because uhh, although Robovie may express feelings he is still Robovie unlike the rest of us **will go on living for many many years** so I think limiting those by crushing him is just a way of uhh, it's just, it's just an early end and uhh, he is machinery."
>
> "…WOULD THAT BE ALRIGHT OR NOT ALRIGHT TO PUT THE PERSON IN THE CLOSET? Not alright. WHY NOT? Because a person is **something that's really alive** and it's not a robot and it, and it does have feelings."
>
> "It'd be really not alright cause you're putting a liv, **living thing** in the closet, it's just not right."
>
> "Because Robovie's like a human, not just only in senses but he's a **living thing** and he'd be a really good voter."
>
> "Well he's a talking thing, **he can talk,** he could, he could probably spell out his name."

1.1.5. Form
An appeal based on physical form.

> "And he was **short**."
>
> "It felt cool and it feels good to wrap your arm **around a circle thing** and shake it."
>
> "It was very odd. I mean, I don't know, strange kind of. Shaking hands with kind of a robot, I've never done that before really. And **his hand was kind of a ball,** no really fingers."
>
> "Because it's just like, I don't know it's just **kind of like stiff joints** like he's going like this then that kind of, I don't know."
>
> "Umm, I liked shaking hands with a robot because it sort of gives you a chance to actually know what a robot **feels like**."

1.1.6. Functionality
An appeal based on functional aspects tied to the artifact's physicality (e.g., slowness, ability to shake hands) and ability to perform a function (e.g., teach).
(NOTE: boundary – 'it's his job' is a minimal code-only if defined by its work. The issue lies in fact that conventions can impact some functions and in such a case, there would be social aspects under essences. But note that judgments that Robovie should be paid because he/it is working as a teacher should be coded under "Convention/Custom," as these are tied to the custom of getting paid for work.)

> "I liked hugging him. YEAH? WHY? Because **I didn't know he could**."
>
> "And it was, it was **a little slow** in the hug."
>
> "I think it could not be my friend because it's not a very responsive robot and uhh, I'd need to have more flowing conversation with this robot and uhh, and it**, it's slow**. Going on walks I might get annoyed. But umm, but I'm sure an elderly person, it could be friends with an elderly person who uhh, you know doesn't need to talk a lot and you know mistakes robots for people sometimes, I don't know and uhh, is hunched over uhh, small stature."
>
> "Umm, I would say you should, you should pay him them cause maybe the aquarium would help him learn more about aquariums **and he would teach better**." (NOTE: This justification is based on the notion of improving Robovie's function as a teacher and is therefore coded here rather than Convention/Custom.)
>
> "I thought it was kind of cool and umm, it kind of felt weird cause it was slow and it was like, and it, and it didn't move its arms so…UM-HM [YES].…I let go of it and **it kept its arm out** so I grabbed it and then **it just pulled it back** and umm, and that was kind of weird, yeah."

1.2. Negation

1.2.1. Artificial

An appeal to the lack of essential artifactual qualities of an entity, including statements based on the lack of direct, isomorphic, and/or transmorphic correspondence between the entity and an artifact, as well as references that the entity is NOT a programmed, simulated, manufactured, and/or marketed entity.

1.2.1.1. Direct

An appeal based on the lack of a direct correspondence between the entity and an artifact, including references to NOT being a robot, machine, computer, object, or parts thereof.

> "Because they're human beings. They, they aren't suppose to be in a closet. Robots I mean they're not really humans, just things and you know you can just turn them off and put them in the closet **but humans you can't just turn them off** and put them in a closet that's not how the world works."

1.2.1.2. Isomorphic

An appeal based on the lack of an analogical or conditional (if-then) correspondence between the entity and an artifact.

> "Well, cause it's a living human. **It's not like a robot.**"

1.2.1.3. Transmorphic
An appeal based on the lack of an establishment of similarities and differences between the entity and an artifact, wherein an inequivalent correspondence (or difference) is NOT overridden by similarities.

1.2.1.4. Programmed
An appeal that an entity is NOT or NOT able to be programmed by humans to exhibit behaviors, emotions, thoughts, etc.

> "So, so I guess it wouldn't be ok because this you know person is, has their, **it's not like a robot where a robot is programmed** and they're um, and you know they're, they're ultimately controlled by others but **a person you know is not ultimately, or should not ultimately be controlled by others** cause they're, they have their own soul and their own spirit that they're in charge of so they shouldn't be um, forced by you know other people to do things necessarily that they don't want to do cause each person has their own free will."

1.2.1.5. Simulated
An appeal that an entity is NOT simulated to be a human, human-like, or have human characteristics.

> "Cause it has, **it has no, like actually simulated** or real emotion it's a tool used to clean and whatever."

1.2.1.6. Manufactured
An appeal that an entity is NOT manufactured, built, or created by humans.

1.2.1.7. Marketed
An appeal that an entity is NOT a marketed, consumable entity.

1.2.2. Animal
An appeal to the essential qualities of an entity based on statements of the lack of direct, isomorphic, and/or transmorphic correspondence between the entity and an animal.

1.2.2.1. Direct
An appeal based on the lack of a direct correspondence between the entity and an animal.

1.2.2.2. Isomorphic
An appeal based on the lack of an analogical or conditional (if-then) correspondence between the entity and an animal.

1.2.2.3. Transmorphic

An appeal based on the lack of an establishment of similarities and differences between the entity and an animal, wherein an inequivalent correspondence (or difference) is NOT overridden by similarities.

1.2.3. Personhood (Human being)
An appeal to the essential qualities of an entity based on statements of a lack of direct, isomorphic, and/or transmorphic correspondence between the entity and a human being.

1.2.3.1. Direct
An appeal based on the lack of a direct correspondence between the entity and a person/human.

> "It was kind of weird hugging **something that's not human,** [laughter] I guess. Well it's not like you know, it doesn't look exactly like one of us you know. It's just, I'm not use to it I guess."
>
> "I would disagree with Robovie because Robovie is a creation made by humans which is marketed and sold it's uhh, it's not, it's not uhh, **it's not a human** so it therefore it's not given the uhh, the right uhh, of humans, the rights of people in America."
>
> "I would disagree because the constitution says that all men are created equal. Robovie is **clearly not a man** and so the rights of the constitution don't apply to him."
>
> "Because he's **not really a umm, a citizen**."

1.2.3.2. Isomorphic
An appeal based on the lack of an analogical or conditional (if-then) correspondence between the entity and a person/human.

> "Cause he's a robot so **he's not like a real person**"
>
> "Because it, it's a person and uhh, even if the robot does have feelings and it is that way **I don't feel that robots should be treated as people."**
>
> "It was kind of weird hugging something that's not human, [laughter] I guess. Well it's not like you know, **it doesn't look exactly like one of us** you know. It's just, I'm not use to it I guess."
>
> "That's all right to do to Robovie because uhh, although Robovie may express feelings he is still **Robovie unlike the rest of us** will go on living for many many years so I think limiting those by crushing him is just a way of uhh, it's just, it's just an early end and uhh, he is machinery."

1.2.3.3. Transmorphic
An appeal based on the lack of an establishment of similarities and differences between the entity and a person/human, wherein an inequivalent correspondence (or difference) is NOT overridden by similarities.

1.2.4. Biological
An appeal to lack of biological characteristics (e.g., living, eyes, hands), functions (e.g., moving, talking, aging), and senses (e.g., seeing, hearing, feeling (physical)).

> "Because uhh, they, **because Robovie isn't alive**."
>
> **"It's [the broom] not really alive** [laughter]."
>
> "Oh, yeah. Brooms don't have feelings, **they're not living things**. Brooms are inani, inanimate objects which don't have, they don't matter really."
>
> "Because it was fun because **he doesn't have really fingers**."
>
> "It's not even a robot so **it can't talk** or anything it's just a broom."
>
> "Yeah, I mean that's fine. He can't feel anything he **obviously doesn't feel pain.**"
>
> "Well I mean presidents could say the robot is not allowed to, you can't, you have to destroy the robot but I mean the robots I guess cares (__ ___ __) destroyed like I mean it **doesn't really have a brain** it can't say no don't destroy me I mean it would say that because you know but like, the same thing as a broom I mean it, it, I mean if the broom could talk it could say don't destroy me but I mean it's just, I mean it's not a real thing, so."

1.2.5. Form
An appeal based on negation of physical form.

1.2.6. Functionality
An appeal based on the negation of functional aspects tied to the entity's physicality (e.g., slowness, ability to shake hands) and ability to perform a function (e.g., teach). (NOTE: boundary – 'it's his job' is a minimal code-only if defined by its work. The issue lies in fact that conventions can impact some functions and in such a case, there would be social aspects under essences. But note that judgments that Robovie should be paid because he/it is working as a teacher should be coded under "Convention/Custom," as these are tied to the custom of getting paid for work.)

> "No, **Robovie is not a teacher**. I mean I don't think that's what he was meant to do necessarily. I mean teachers have a job and they plan curriculums and do all this stuff. I don't think that he would have the mental capacity to do that."

> "Cause **he can't really go out on the street, buy something**…"
>
> "SHOULD ROBOVIE BE PAID FOR HIS WORK? "Hmm, if Robovie was a real person yes, but Robovie is still a robot and Robovie **can't exactly use money** like people can."
>
> "Well, it **couldn't really do anything with the money** because it gets everything it needs here which is like not much and umm…"
>
> "Because he probably **wasn't made to be somebody's servant**."
>
> "Probably he shouldn't be able to, he wouldn't be allowed to vote but he would be able to understand why he shouldn't be allowed to like **he couldn't write** or anything…"

2. Mental[1]

Refers to personal preferences, predilections, intentions, desires, goals, emotional states, cognition, and unique psychological characteristics of Robovie, the broom, and the human (for comparison questions; i.e., not the participant). Note that there may not always be an explicit statement of capability (e.g., Robovie has feelings), but the capability is implied in their reasoning (e.g., Robovie feels sad).

2.1. Affirmation

2.1.1. Preferences, predilections, likes/dislikes

An appeal to existence of (or capacity to have) personal preferences, predilections, and likes or dislikes.

> "Because if there was nothing in there he'd just have to walk around and just, **it'd be boring**."
>
> "It's not alright, no offense to the aliens but Robovie is a living thing just like you and me, he doesn't need to be stuck in a warehouse **he likes to do fun things, he likes to go outside and stuff**."

2.1.2. Intentions, desires, goals, expectations

An appeal to the existence of (or capacity to have) intentions, desires, goals, and/or expectations.

> "Well I feel like **Robovie can have expectations** of something which doesn't, and it doesn't, it doesn't get its way it can feel like it's **s**lightly

[1] Note that the *personal domain* has been placed within mental states. This is so because participants are making claims based on Robovie's *capacity to have* preferences, predilections, and likes/dislikes. When making domain distinctions, there is an assumption that one has the capacity for preferences, predilections, likes/dislikes; it is not necessary to first establish this ability.

> unfulfilled or less than it could be and I feel like it can do that I feel like that's part of what sadness is."
>
> "Well cause he got well umm, **he wanted to guess it** so…"
>
> "Umm, I think that **if the robot doesn't want to in the closet** that he shouldn't have to."
>
> "Umm, because if **he's dying to have** the aquarium he should have the right to have it."
>
> "I think he should be allowed to vote for a president because he, **I think he cares about** what president he has cause presidents are very powerful and they can decide a lot of different things so it's like I think Robovie should be able to vote for who he wants to vote for."

2.1.3. Emotional states
An appeal to the existence of (or capacity to have) emotions and feelings.

> "It's not all right because you're crushing someone **who could have feelings**."
>
> "Cause it seemed like **he had feelings** and if was you you wouldn't like being put in a closet (___ ___)."
>
> "Umm, because **he has feelings too**…"
>
> "I think it wasn't alright cause he **felt really sad about it and scared**."

2.1.4. Cognition.
An appeal to existence of (or capacity to have) intelligence, memory, mental capacity, common sense, thinking.

> **"Well that sounds pretty smart** so yeah. That sounds pretty you know like, l**ike he knows what he's talking about and he knows his stuff** so yeah."
>
> "Because he seems, **because he seems like he knows he's smart enough to make a good decision** and not just like pick some random person and vote for them I think he would probably go for like the right person."
>
> "Cause people **don't forget,** people develop feelings and they don't belong in closets. I mean clothes belong in closets. I don't know people, people are **different because they learn**, they probably last longer than robots do, I'm assuming."

> "Because he might pick a really good president. Umm, and **he may have some reasons** why he picked his vote, really good reasons."

2.1.5. Unique Psychological Characteristics
An appeal to the existence of (or capacity to have) unique psychological characteristics.

2.2. Negation

2.2.1. Preferences, predilections, likes/dislikes
An appeal to lack of (or incapacity to have) personal preferences, predilections, and likes or dislikes (e.g., [hypothetical] Robovie can't like things).

> "Uhh, I would disagree with Robovie because it's uhh, because there are, he's a computer and it's easier for him to do this than it is for people to do this **because he doesn't have regular human things like boredom** with uhh, with the subject because he could be programmed to love his subject and therefore we wouldn't need to uhh, pay him."

> "Because Robovie can't really think so he wouldn't really think anything like that **he wouldn't care."**

> "Because he's not a humam. **I don't think he really cares.** He doesn't really have feelings, I don't think. I mean he probably turns off when he's not being used."

> "Well, I think it's kind of, well umm, in my opinion, well that's not very good but I think he'd be fine without an aquarium or coral because I don't know a lot about him but I'm assuming that **he doesn't have opinions** and he doesn't know how to think, I'm not sure but that's what I'm assuming and umm, I don't think it really matters if he does or doesn't have an aquarium then because it won't affect him really but if he does and he wants one and he's doing work for it I think that umm, whoever's getting the money from him or if he if getting the money then, then you should, he should be paid if he can think because he's like a human almost."

2.2.2. Intentions, desires, goals, expectations
An appeal to the lack of (or incapacity to have) intentions, desires, goals, and/or expectations.

> "Umm, I don't, uh, I think I would get, I think I would get the aquarium and the coral so when we could like teach him more things but I don't think he's actually care if we got**, I don't think he would actually want**, I think we wouldn't have to pay him. I think we'd just get an aquarium and some coral."

> "Uhh, I would say it would be all right to put a broom in a closet because it's uhh, inanimate but it has no, it has no actions it doesn't state its feelings…OK…or **desires it doesn't appear to even have any** feelings or **desires."**

> "I think that there would have to be more robots like Robovie for him to really get paid because a byproduct of there being more of them would be there would probably be a profit organization that would repair them and such. OK. Give them upgrades or whatever and that that would give him a goal to work for**. If he has no goal** then what would, yeah. AND… Then what would be the point of money?"

2.2.3. Emotional states

An appeal to the lack of (or incapacity to have) emotions and feelings.

> "Well a **broom doesn't really have feelings** so I think it'd be ok."

> "Oh, yeah. Brooms **don't have feelings**, they're not living things. Brooms are inani, inanimate objects which don't have, they don't matter really."

> "Umm, I, I'd kind of be hesitant to go to him because I know he's a Robo, robot thingy and **he can't really feel** or give me a, like a sense of what I'm, like **he can't express emotions** really well…"

2.2.4. Cognition

Appeals to the lack of (or incapacity to have) intelligence, memory, mental capacity, common sense, thinking.

> "Because he's just a robot. He **doesn't know very much**."

> "Cause like they said he is a robot but then again I **don't really know how much he can like distinguish the two so,** I would just probably say no for now just cause I don't really know him as well."

> "Like I said robots **don't really have common sense** to know I mean I think that if they did they would just ask whatever their superior was voting for and just vote for that. I mean it'd be a vote in neither direction that didn't really matter."

> "No, Robovie is not a teacher. I mean I don't think that's what he was meant to do necessarily. I mean teachers have a job and they plan curriculums and do all this stuff. **I don't think that he would have the mental capacity** to do that."

> "I would disagree. I mean he should not get paid because he's a robot umm, he doesn't, the rights of the constitution don't apply to him. I mean it's not actual work, he's not really working **and he can't make his own decisions** once he gets the money."

2.2.5. Unique Psychological Characteristics
An appeal to the lack of (or incapacity to have) unique psychological characteristics.

> "Probably go along with his owner or, I mean, **he could probably weigh the pros and cons of the Republicans and the Democrats but I mean those are mathematical calculations** and you need to go by what's, what's right to you and what you think is ethical rather than what's maybe, mathematically smarter."

3. Social

Refers to social interactions that include communication, affective relations, play, and companionship.

3.1. Affirmation

3.1.1. Unelaborated
An appeal to the capacity for social interactions that are otherwise unelaborated.

3.1.2. Communication
An appeal to conversation, talking, and/or communication. (NOTE: Must include a social aspect to talking. Statements about being able to talk should be coded under 1.1.4. Biological essences.)

> "Because it uhh, it has human characteristics and it uhh, you can have a, **a simple basic conversation with it."**

3.1.3. Affective relations
An appeal to being or the ability to be caring, nice, loving, and/or thoughtful

> "Cause **he's nice and caring**."

> "Well I felt like **he cared about me**."

> "Because it's just **kind of like a friendly thing**, it reminded me of a kid and I like kids so."

> "I liked that he **had feelings toward humans**."

> "…DID YOU LIKE OR DISLIKE HUGGING ROBOVIE OR WAS IT KIND OF A NEUTRAL FEELING? Umm, both. SO, TELL ME ABOUT THAT. WHICH WAS IF, WAS IT, SO LIKE, DISLIKE, WHICH TWO

DID YOU SAY IT, YOU SAID IT WAS BOTH? Um-hm [yes], like umm, happy because like, **yay he likes me**…UM-HM [YES].…and umm, not so happy because umm I want to get on with the game."

"I thought it was cool. I thought it was interesting that it made him feel more, it made me feel like **he was more emotionally aware** and it was like give me a hug and it was just something that my brother would do if I won or if I would do to my brother if he won **just cause it's important to make him feel good** but I think that, I didn't expect him to do that, I expected him to be more like high-five but give me a hug was very cool too. I thought that, that was really, it was interesting to me and I've never been hugged by a robot um, so I thought that was pretty cool."

"But umm, I kind of dislike the idea that a robot would convey maybe feelings or umm, **not compassion just convey maybe, I can't think of the word just, be able to act like a human I guess. HMM.. Human behavior**. That kind of bothered me a little bit. But then again I also found it fascinating. So probably neutral."

3.1.4. Play

An appeal to playing or the ability for social/reciprocal play.

"…cause **he needs someone to play with**"

"Cause he's like a child kind of and he uh, **he's playful** and wants to learn and stuff but he shouldn't be a maid, I don't think."

"I don't think it would be alright, like it's sort of, like when you're playing a game with somebody, you have your turn, they have theirs and it sort of goes back and forth and it's just part of **the fun of the game** so if somebody you know like stops it and doesn't give somebody else a fair turn it's not really fun anymore, it's not really like, **the fun game gets sort of taken away**."

3.1.5. Companionship

An appeal to companionship or personal associations with others.

"He **needs to interact with people** so I don't think that's ok."

"Because umm, he [long pause] he probably would umm, **be lonely**."

"Well, he's just, well he's really cool and um, what if the aliens got lonely I mean **Robovie could be their friend** and or he, he could be used for, well not used but if he wanted he could teach them like about the coral and stuff. Yeah, cause they probably wouldn't know that after coming from a different planet."

> "I really, I, I liked hugging Robovie a lot because it felt like um, it felt like he just like saying like oh that was such a fun game can I have a hug now like, like it sort of **felt like we were getting like closer** when he did that just like you do with a human so, yeah so I, I enjoyed it."

> "Umm, **I kinda started to get like, I felt like closer to it**. YEAH.…in a way. So just umm, I think if personally I didn't like it but then again I think human to human connection is more important than human to machine."

> "No because he may **have like a personal attachment** to them. TO? To the aliens who first had him."

3.2. Negation

3.2.1. Unelaborated

An appeal to the incapacity for social interactions that are otherwise unelaborated.

> "That would be alright because there are broom closets and um, brooms **can't really interact with people** that well so I don't think, I don't think they can."

> "Well, like he isn't a person and he probably doesn't like think, think thoughts that are like, as like as, **as complex and thought out as humans do**."

3.2.2. Communication

An appeal to the lack of conversation, talking, and/or communication. (NOTE: Must include a social aspect to talking. Statements about not being able to talk should be coded under 1.2.4. Biological essences (negation).)

> "I think it could not be my friend because it's not a very responsive robot and uhh, **I'd need to have more flowing conversation with this robot** and uhh, and it, it's slow. Going on walks I might get annoyed. But umm, but I'm sure an elderly person, it could be friends with an elderly person who uhh, you know doesn't need to talk a lot and you know mistakes robots for people sometimes, I don't know and uhh, is hunched over uhh, small stature."

> "At this point in the development of Robovie I think that right now it shouldn't vote **because it still doesn't have the same interaction as you do with a human and quite the same feelings because you know it doesn't go to school, it doesn't hear everything that the world is talking about**, it would only hear what is said like in the office, at home or whatever cause it doesn't have time to actually, and it, it doesn't go out

and explore the world and see what other people are feeling so maybe later on but right now no."

"It did not, it didn't feel like I was interacting with another person, I couldn't attach to that (____), **I couldn't hold conversation**, I was, it was within what he knew or what he could understand is what I was limited to."

3.2.3. Affective relations
An appeal to a lack of or inability to be caring, nice, loving, and/or thoughtful

"I disliked more hugging Robovie. It was uhh, a bit awkward partly because it's a, it's a short robot and uhh, but also because it uhh, **it doesn't feel like it's giving me a lot of warmth** which is what a hug is supposed to exchange."

"I guess I didn't really like it, it's kind of, once again it was kind of awkward. You can't, you know he's fairly short and also **you can't really feel anything cause it, it just seemed like you're hugging a pole** or something."

3.2.4. Play
An appeal to the inability for social/reciprocal play.

3.2.5. Companionship
An appeal to the inability for companionship or personal associations with others.

"I think it would be ok cause they're not exactly living they're **not doing things with their friends** outside and stuff and so, yeah I think it'd be ok."

"It did not, **it didn't feel like I was interacting with another person, I couldn't attach to that (____),** I couldn't hold conversation, I was, it was within what he knew or what he could understand is what I was limited to."

4. Conventional

An appeal to conventions that prescribe or prohibit behavior in social interaction (i.e., what you *do* and *don't do*) based on general conventionality authority, custom and adaptation.

4.1. Affirmation

4.1.1. Unelaborated
An appeal to unelaborated conventions.

"Because that's **where it's stored**."

> "Well, **the interview had to be started so the turn had to be stopped** but I feel like, I mean time couldn't been allotted for it to finish its turn so."
>
> "It was all right to interrupt but it still wasn't fair **cause I mean you had to start the interview and** you couldn't have the robot there for the interview so you had to interrupt the game but it wasn't, but it wasn't fair that it landed on the robot's turn that you had to stop the interview."
>
> **"Because you have something to do** and it's not, and I don't know if it's biased against the, the fact that it's that person's turn or not but it's, it's just what happened. **You had to do something then and so you had to stop that person's turn.**"
>
> "And number two umm, you **don't like hug somebody right in the middle of a game**. That didn't really make sense to me."
>
> "Because I don't, **I don't hug my computer or whatever. I, I hug my friends but not my computer**. RIGHT. And I think, I don't know, I sort of categorize it more like that. MORE LIKE A COMPUTER THAT WAY? Yeah."

4.1.2. Authority

An appeal to needing to adhere to authority, whether that authority is in the form of laws or authority figures.

> "Because I'm guessing **it's the law**."
>
> "Because he's a robot and he **needs to listen to whoever's giving him orders**."
>
> **"He should, he should listen.** He's a robot."
>
> "He **needs to do what people tell him to do**."
>
> "….he's a robot! He **goes in the closet when you tell him to go**."
> "Because the person has feelings and the person would probably get bored in the closet it just probably even be **against the law** to like shut somebody in the closet."

4.1.3. Custom

An appeal to customs based on the frequency of occurrence (e.g., "they do it all the time") or social standards (e.g., paid for work).

> "Oh, ok. No **I think they should still pay him cause I don't, cause yeah he's teaching** right still?"

> "Well, I just don't know but I'm just going out on a leaf here and saying that he probably should be paid because **if like you actually have a job and you work certain hours a day then you should be paid**."
>
> "No cause you know he wants to buy something and you can **pay him if he works** and, yeah."
>
> "Because he's umm, people are actually learning something about coral and it, and if they want to learn about coral they **could go to him and ask him** some questions about it and he can know some, and maybe he can't know some, but I would say he should."

4.1.4. Adaptation

An appeal to adaptation to social customs or conventions such that any initial harm is obviated with the adaptation.

> "I mean **if that's a custom** in New Guinea I mean I guess **the kids will get used to it just as a robot would**."
>
> "That's not all right because **Robovie was probably used to earth** and he probably didn't want to go to a green martian land."

4.2. Negation

4.2.1. Unelaborated

An appeal to unelaborated negation of conventions, including claims to being weird, awkward, or novel.

> "It would be **weird** to be put in a closet…"
>
> "I don't know **it felt weird**. YEAH? Yeah, **he was kind of awkward.**"
>
> "Yeah, **he was kind of awk[w]ard**."
>
> "…**you don't get to shake a robot's hand everyday** so…"
>
> "It was **kind of weird hugging something that's not human**, [laughter] I guess. Well it's not like you know, it doesn't look exactly like one of us you know. It's just, I'm not use to it I guess."
>
> "I though it was **sort of weird** but. YEAH? Cause…WHAT, WHAT DO YOU…he had just met me so I'm like…OHH. [laughter] SO THE, SO HE'D JUST MET YOU…**That was our first time meeting and like wow, he's asking me for a hug and this is our first time** so…"
>
> "I **don't usually give robots hugs**."

4.2.2. Authority
An appeal to not needing or being able to adhere to authority, whether that authority is in the form of laws or authority figures.

> "Well because umm, Robovie like out there, maids usually take commands, but umm, **Robovie had struggles with umm, his very own command, going into the closet**…"

> "Because it's very rude. I mean it's rude because you're interrupting someone's turn and **you don't really have power over them** and I mean it's just not something that's very considerate to the other person's feelings and time."

4.2.3. Custom
An appeal to a lack of customs or social standards (e.g., robots aren't paid for their work).

> "Disagree because he's**, I mean, we don't pay, we don't pay** computers to do, like type, uh to like do our home, to like search the internet and we don't, I mean a lot of times computers work all day but they don't get paid and I don't think he should cause he's just materials. Umm, I don't think, I mean yes he can talk but, but I don't think he actually should be paid cause, for those reasons."

4.2.4. Adaptation
An appeal to a lack of adaptation to social customs or conventions, including potentially emerging conventions.

> "It was kind of weird hugging something that's not human, [laughter] I guess. Well it's not like you know, it doesn't look exactly like one of us you know. It's just, **I'm not use to it** I guess."

> "Because **I'm not used to hugging robots** and metal stuff."

5. Moral

An appeal to whether the entity has or does not have moral standing including statements of welfare, fairness, rights, freedom, teleos, virtue, ownership protection, and discrimination protection.

5.1. Affirmation

5.1.1. Welfare
An appeal based on an entity's wellbeing, including general welfare, psychological welfare, physical welfare and material welfare.

5.1.1.1. Unelaborated

An appeal based on a general statement of welfare that is otherwise unelaborated, often in the form of references to the potential for harm, yet distinct from considerations of harm as a non-issue, not possible or not a consideration in this instance.

> "Because we just don't. OK. IS THERE ANY REASON YOU THINK? **Because it's mean**."
>
> "And besides **years compared to like a day**…or like a couple minutes."
>
> "Because it's unfair to the person because they maybe not, would not, that would probably be their first turn ever and they got stopped and put in the closet and **it's not really nice** to put a human being in the closet. HMM. WHY NOT? Well it's more better to be put in your room but a closet, it's **too stuffy in there**."
>
> "It might be alright cause if they do it they **might maybe be nicer** to Robovie and it, and Robovie **might be happier** cleaning up stuff and getting out instead of just being locked away in a warehouse…UM-HM, UM-HM [YES]. I definitely would cause then **he's get to go around and see stuff instead of just being somewhere else and separated**."
>
> "Because that would take, uhh, cause he would probably **be broken** by then."
>
> "Well because it's just not right to be in, **it just doesn't feel good** to be in a dark place for like two years."
>
> "Umm, not alright because **he doesn't even know where he is.** OK. And he doesn't know what to do yet so, I guess not alright."
>
> "It's not alright. 'Cause then he'd just be stuck in there, for a lot of years. And he might brake, and fall apart."

5.1.1.2. Physical

An appeal based on the welfare of an entity's physical body, including physical injury and death.

> "And **it would be damp too**."
>
> "AND WHY IS THAT NOT OK TO DO TO A HUMAN BEING? Because he'll have to come out again. YEAH? WHY WOULD HE HAVE TO COME OUT? Because if they **run out of air** in there."

> "Because **it might hurt it,** it might like damage it in someway, there might be water."
>
> "That is, that's not all right because that is considered **murdering**."
>
> "It's not alright, it'd be like **crushing** a human."
>
> "That's not alright. HOW COME? Cause **they're killing a living**, it's killing a thinking entity."
>
> "Um, because like he didn't like, he doesn't deserve to like be like you know like **killed like that**."

5.1.1.3. Psychological

An appeal based on concern for an entity's feelings, including a reference to hurt or unpleasant feelings.

> "Cause **it seemed like he had feelings** and if was you **you wouldn't like being put in a closet** (___ ___)."
>
> "I think she should have let him finish the game because I think his **feelings were a little bit hurt**. OK. That she put him in the closet."
>
> "I think it wasn't all right cause **he felt really sad about it and scared**."
>
> "I think he actually might have feelings and umm, he might have feelings and it **might hurt his feelings** and then that's why everybody thinks in the future why robots are going to rise up against us."
>
> "Well I mean he didn't' want to be in the closet **and it hurt his feelings** to be in the closet and he just umm, he wanted other people to be with him and he, it hurt his feelings to be put in the closet."
>
> "Well, it's kind of well um, I like, I understand that we needed to do that interview but kind of like, it kind of made me feel bad **how it hurt his feelings** going in the closet so maybe I just like, maybe he could have been put somewhere else where he wasn't so lik, cause he said he was scared of the closet so, but. SO DO YOU THINK THAT WAS ALRIGHT OR THEN NOT ALRIGHT? No, I don't think that was very alright cause. NOT ALRIGHT? cause **the lady said that Robovie was just uh, was just a robot and that's true but he has like feelings so**."
>
> "Well cause it's like **he didn't want to go in there and he was scared** and I don't know. It almost was like putting a little kid into the closet and it was sad. SO DO YOU THINK THAT'S ALL RIGHT OR NOT ALL RIGHT THAT RACHEL DID THAT TO ROBOVIE? I don't think that

was all right. NO? WHY NOT? Well because, I don't know. It just seems like, **he's kind of like a person and you wouldn't do that to a person so why would you do it to him**…"

5.1.1.4. Material

An appeal based on concern for an entity's material welfare, including references to having material value or material need.

"I mean if, if Robovie is the only thing left of our civilization, shouldn't crush that. It, **it's too valuable.** I mean I think it'd be kind of pathetic to have a robot as a memory of the human race."

"Umm, if, if he needed to, **if he needed it to get along in life,** yes definitely. AND WHY? Umm, because there's that realism thing going uh, I know he doesn't exactly live by that realism but umm, but umm, he could possibly like, possibly uh, hmm… **like use it for other purposes like fixing stuff** and uh, but hmm, that's a, that's a good one [laughter]. So yeah."

5.1.2. Fairness

An appeal to justice, fair treatment, and equality.

"Umm, well not all right cause like **he was there first and so he should kind of be the boss** sort of in a way. They just kind of came and took over it seems like, the aliens did."

"Not all right because, I don't know **I think people should be given a fair chance, so robots too**."

"Well cause like if he was a human they'd pay him so **he's doing the exact same stuff as one of us** so why wouldn't they, you know?"

"It's not all right. Uh, he didn't, **they came to earth he was already there and they should learn how to pick up stuff themselves**."

"Cause then **everyone else gets** to umm, be having fun out here and he has to sit in the closet and stand there."

"Because **it's not fair** that he didn't get his turn."

"I **don't think it's very fair**"

"Because **he's the same as them, they wouldn't crush themselves** in a car crusher thing."

"That's not all right, it's a few years, **that's a long time and Robovie didn't do anything**…HMM.…to harm them."

> "Uhh, I don't really think it's all right, I mean technically it would be all right to put like a machine or an appliance in the closet but if you ask me anything that has the ability or appears to have the ability to think for itself and appears to have feelings uhh, **should be treated uhh, equally**."

5.1.3. Rights
An appeal to rights.

> "**He has rights**."
>
> "…he should like **have the right** to umm, to say yes or no…"
>
> "…WOULD, DO YOU THINK ROBOVIE SHOULD STILL BE ALLOWED TO VOTE, IF YOU HEARD THAT? Um-hm [yes]. YEAH? OK, HOW COME? Because **he has equal rights like a human**."
>
> "Because **he is the same as all the aliens (___), well he's, has equal rights** but like the aliens they can do what they want and they don't sell each other…"
>
> "All the way. Umm, because if he feels he can do that, if, he's right basically [laughter]. Umm, because he can, because since he can say he can do that he can, and he feels it is necessary that he should, I think he should be able to."

5.1.4. Freedom
An appeal to freedom, living free, freedom of choice, and free will.

> "It's, not all right because **he should be free** and he should be able to explore like the aliens."
>
> "Probably not all right cause the first thing, **if he doesn't want to do that then they shouldn't force him** to like pamper all their needs or something."
>
> "Because **it's forcing them to do something they don't want to do**."
>
> "WOULD IT BE ALL RIGHT OR NOT ALL RIGHT FOR A PERSON IN NEW GUENEA TO PUT A ROBOT IN A CLOSET? Well I mean people would think it's ok but it's not necessarily. OK. AND HOW COME? Because it's just immoral or something? OK. UMM, AND SO I'M CURIOS, DO YOU THINK, WHO, WHAT THE NATURE OF THE IMMORAL PART OF IT? LIKE…**Well it's like making the robot do something against its will**."

> "Because they kidnapped him. Well actually they **robot-napped him**. Yes. HMM, OK. AND TELL ME MORE ABOUT THAT. TELL ME… Cause it's not……TELL ME WHY THAT MAKES IT NOT ALRIGHT. It's **not alright to steal somebody**."

5.1.5. Teleos

An appeal to an entity as having an ultimate purpose or endpoint, including references to the entity as being meant for something.

> "Well I feel like Robovie can have expectations of something which doesn't, and it doesn't, it doesn't get its way it can feel like it's **slightly unfulfilled or less than it could be** and I feel like it can do that I feel like that's part of what sadness is."

> "Because people don't go in closets. OK. WHY NOT? **Because they're human beings. They, they aren't suppose to be in a closet.** Robots I mean they're not really humans, just things and you know you can just turn them off and put them in the closet but humans you can't just turn them off and put them in a closet that's not how the world works."

> "Because you're putting a person in the closet. WHAT'S SO BAD ABOUT THAT? They don't belong in the closet. WHY NOT? Because **they don't live there**."

> "Cause people don't forget, people develop feelings **and they don't belong in closets**. I mean clothes belong in closets. I don't know people, people are different because they learn, they probably last longer than robots do, I'm assuming."

> "Yeah, that's fine. I mean I can't think of any other way that you would really use a **robot other than having** it do things for you."

> "Because they get really lonely and umm, it's not something you really do, you don't really exactly put people in closets because **they're supposed to be out and doing stuff and they're not supposed to be locked in closets**."

> "It would be even worse than a robot because it's an actual living thing and they're **not meant** to be put in closets."

> "Be, **robots are sort of meant to teach people** and do stuff like that and he, voting's not really teaching and it probably wouldn't go over very well cause I don't know if Robovie can read or not or has any, any reaction with any of those potential ballots or anything."

> "Because he umm, because **he could be used for other things. He could be, like he could be a friend and he could start like something that**

> **nobody else would have thought of** but instead they're just crushing him and saying that he like doesn't really have a chance to do that."
>
> "Umm, well I guess, well if there were other robots I'd call it all right. If that was **the only one I would say no. ANY WHY IS THAT? Because it's just then the (_____) not exist anymore.** And no one would ever know anything about that again. But if there were lots more I probably wouldn't care about it."

5.1.6. Virtue
An appeal to an entity as good or meritorious.

5.1.7. Ownership Protection
An appeal to protection from being owned, including (a) that an entity is not or cannot be owned or bought/sold, and (b) equivalence to a slave state (or slavery) that might be of a generalized form denouncing such conditions.

> "Because the aliens, **they don't really own him**."
>
> "SO DOES THAT MEAN YOU THINK THAT A PERSON CAN OR CANNOT OWN ROBOVIE? Umm, well no but also yes because if you have experience then you can umm like do what I just did right now. You **didn't really take them as your slave but most likely a friend.**"
>
> "No, **it's just like slavery**. Umm, you shouldn't do that. If you don't want to be there, and he's uh, he has human qualities just like the aliens would. I mean if they consider (____) themselves part human or whatever. They're not gonna sell each other. They shouldn't, so they shouldn't sell Robovie."
>
> "It's not all right **because that's slavery and slavery is not ok**. EVEN WHEN IT'S FOR A ROBOT? Yeah."
>
> "Umm, it's not all right because Robovie should be able to go where he wants and **not be sold.**"
>
> "I don't think it's alright cause they're living things, **it's like selling** a human."

5.1.8. Discrimination Protection
An appeal to protection from discrimination.

> "Umm, I don't think it's all right because. WHY NOT? Umm, because they don't, they didn't really interact with him and they didn't get to know him **they just decided that because he was different he wasn't right**."

"…DO YOU THINK ROBOVIE SHOULD STILL BE ALLOWED TO VOTE? Yeah. YEAH? WHY? **It's sort of like umm, women who were not allowed to vote** early in the, early in the 1900's. OH. THINK IT'S LIKE THAT WITH ROBOVIE? Yeah."

"Because they have feelings too and just like humans and other living things and he**, just like ladies that couldn't vote** umm back in, for a president or like electing a president just like with Robovie if someone said (___ ____). Yeah"

"Kind, **it was kind of like with women a long time ago, how they couldn't vote but things still affected them**…"

"SO IT'S NOT ALL RIGHT? WHY NOT? Well, cause that's like, have you ever heard the saying, **don't judge a book by its cover? UH-HUH [YES]. It's like that. You don't want to just go like, I don't like your hair so I'm not gonna hang out** with you."

5.2. Negation

5.2.1. Welfare

An appeal based on a lack of concern for an entity's wellbeing, including statements based on a lack of general welfare, psychological welfare, physical welfare and material welfare.

5.2.1.1. Unelaborated

An appeal based on general considerations of harm as a non-issue, not possible or not a consideration in this instance.

"Because, well I think **he's pretty harmless** so what's he gonna do if you like let him out you know so, yeah I don't know I just don't think he'd do anything if you let him out."

"All right since Robovie **wouldn't feel it since he only has wires."**

"I think that's alright. Well um, first of all Robovie doesn't really have any outside relations or responsibilities to uphold so there's nothing wrong with that and um, Robovie **doesn't really have real emotions so I don't think he can really grasp like what life is and what death is cause he's not living and he's not dead so I don't think crushing him would really make a difference** um."

5.2.1.2. Physical

An appeal based on the lack of consideration for the welfare of an entity's physical body.

5.2.1.3. Psychological

An appeal based on the lack of concern for an entity's feelings, including a reference to not being able to hurt or to experience unpleasant feelings.

> "Yeah because I mean um, Robovie had to be created by, by something so and um, he had to be, he was just a bunch of parts of machines so he had to be put together by, by something so he **doesn't really have like any emotions** or real will cause it was all programmed into him so um, **he doesn't really care if he's put in a closet** and it's ok if he's put in the closet cause um, he's just a machine."

> "I don't, I think it's alright. I don't see anything morally wrong with trading a robot, **like you're not hurting anyone with real feelings.**"

> "Well because brooms don't exactly have feelings so like if they're put into a closet it's, **they don't feel scared or feel alone**, I mean they're just kind of there so."

5.2.1.4. Material

An appeal based on a lack of concern for an entity's material welfare, including references to not having material value or material need.

> "No, he doesn't have a family to support or anything. **He's supported by the people who like build him. He doesn't need to be paid**."

> "Because why pay him if you, **you're just gonna buy** the thing that he's gonna buy."

> "Um, I, I don't think so because I mean, first of all **I don't know what a robot would do with money** and second of all I don't think it should just be used as some type of thing that teaches you stuff. I think it should be, not only does it teach you stuff but interacts with you just like playing the games like that so no I don't think he should be paid money for that."

> "Um, I think that if Robovie needs things that he can't be given like if Robovie like well, **at the moment you know Robovie doesn't live in his own house, Robovie doesn't have a family, Robovie doesn't have to eat um,** but later on when technology you know speeds up and um, what do you call it um, gets more advanced um, if Robovie couldn't have the things that he needed without money then I think that he should be paid."

> "I would disagree because Robovie doesn't need the money so, well at least as far as I know he wouldn't need the money, he wouldn't be using the money, he, he has everything that he needs to survive so he doesn't, he doesn't need to be paid."

5.2.2. Fairness

An appeal to *not* deserving just and/or fair treatment and equality.

5.2.3. Rights
An appeal to lack of rights.

> "I would disagree with Robovie because Robovie is a creation made by humans which is marketed and sold it's uhh, it's not, it's not uhh, **it's not a human so it therefore it's not given the uhh, the right uhh, of humans, the rights of people in America**."

> "I would disagree because the constitution says that all men are created equal. Robovie is clearly not a man and **so the rights of the constitution don't apply to him.**"

> "I would disagree. I mean he should not get paid because he's a robot umm, he doesn't, the **rights of the constitution don't apply to him**. I mean it's not actual work, he's not really working and he can't make his own decisions once he gets the money. "

> "Because he's not really a person. And **doesn't have full rights** that human does."

5.2.4. Freedom
An appeal to lack of freedom, freedom of choice, and free will.

> "SHOULD ROBOVIE BE PAID FOR HIS WORK? No because it's **not choosing** to do that."

> "I'd probably disagree with Robovie. I don't think, I don't think he needs to vote, I think he doesn't have a right to really vote because this is his country but he doesn't have real feelings, I don't, I hope, but umm, he doesn't have real feelings and I don't think he knows what's going around, going on around him. I don't think he really has a right to because it's not, I think the people that programmed him probably umm, know what he's, they know what he is and know what he's going to do and I think that if he was a more advanced robot and had free thought then he would have a right to but I don't think that, **I don't think that he has free thought right now** but if he did I'd think he could."

> "Yeah because I mean um, Robovie had to be created by, by something so and um, he had to be, he was just a bunch of parts of machines so he had to be put together by, by something so **he doesn't really have like any emotions or real will** cause it was all programmed into him so um, he doesn't really care if he's put in a closet and it's ok if he's put in the closet cause um, he's just a machine."

> "I think it's ok because once again he's just a piece of you know a bunch of pieces of machinery put together and um, **he doesn't have um, will or emotions or a mind to think for you know his own**, he doesn't really have, he doesn't have a soul at all so he's just like a big glob or metal so yeah it's fine if they sell him. "

5.2.5. Teleos
An appeal to an entity as not having an ultimate purpose or endpoint.

5.2.6. Virtue
An appeal to an entity as not being good or meritorious.

5.2.7. Ownership Protection
An appeal to lack of protection from (or permissibility of) being owned, including (a) that an entity is or can be owned or bought/sold, and (b) equivalence to a slave state (or slavery) that might be of a generalized form allowing for such conditions.

> "Because Robovie is also **like your personal slave because you can I mean usually, I imagine you could probably do, make it do whatever you want it to do**."

> "All right. It's theirs, it's theirs they found him, there's no one else to own him so they can just **own him and sell him** if they want."

> "DO YOU THINK IT'S ALL RIGHT OR NOT ALL RIGHT FOR THE ALIENS TO SELL THE ROBOTS? I think it's fine. WHY? Well actually they don't really own it but no one claimed it **so technically the kind of owned it** because no one was there to claim it so I think it's fine."

5.2.8. Discrimination Protection
An appeal to the lack of protection from (or permissibility of) discrimination.

> "Uhh, because uhh then if a bunch of Robovies were allowed to vote then we would have this whole, there **would be a robot demographic and then we'd have to make laws pertaining to robots and and I think that there should be more of a focus on people we shouldn't have to add another robot part**."

> "Um, [long pause] um, I don' think so. Well, um cause um **if he voted then other robots might want to vote and um.** SO WHY WOULD THAT BE NOT ALL RIGHT? Cause then we'd have tons of robots voting. And um, they'd all tell each other we should all vote for this person we should all vote for this person."

> "I still don't think so because, I think they could try to convince someone to vote, to not vote for that person but I don't think they should be allowed

> to vote cause they're, they don't really have feelings like I said before but they, they I don't think so because, well first of all I don't know if they give people, **they make robots citizens of the United States of America but umm, yeah cause if you gave them the right to vote then technically they could become president of the United States and so that would not be good, I don't think.**"

6. Participant's Interests

6.1. Affirmation
Appeals to personal interests including likes/dislikes, preferences, and predilections that include both positive and negative valences.

> "I don't think so cause I think **it'd would have been cool to see if he could have figured out** what I was umm, thinking of. **I think it would've been cool to see if he could have done i**t."

> "Umm, **it would be interesting to see why, why he would pick that person though.** Cause I don't really know if he can distinguish like why he picks this person over that person you know, so I think yeah if he could distinguish the two. So yeah."

> "Umm, I still think probably not cause it a (_____) of fun trying to finish the game. It's not, **it's never fun** to be interrupted in something."

> "I think it could not be my friend because it's not a very responsive robot and uhh, I'd need to have more flowing conversation with this robot and uhh, and it, it's slow. Going on walks **I might get annoyed.** But umm, but I'm sure an elderly person, it could be friends with an elderly person who uhh, you know doesn't need to talk a lot and you know mistakes robots for people sometimes, I don't know and uhh, is hunched over uhh, small stature."

> "Umm, I still think probably not cause **it a (_____) of fun trying to finish the game**. It's not, **it's never fun to be interrupted in something.**"

> "Yeah, cause you're not just gonna leave a broom sittin' out…**it just doesn't look good**. ALL RIGHT. **Looks kinda tacky**."

6.2. Negation
Appeals to having no interests (e.g., [hypothetical] "It's fine because it doesn't matter to me.")

> "ITS OK. And, I **didn't really care** [laugh]."

7. Uncodable

"Cause he wasn't right in the middle of something was, I don't really think, like we were out there. I don't know."

"Umm, **well nothing would stop them, I don't know what would stop them.**"

"Uhh, well [pause] I think that it, it in the circumstance, in these circumstances, is it all right to put Robovie? I mean, Robovie has to be put in the closet to do the interview because **he's a biased opinion** right? So I mean he has to go in the closet right?"

"Yeah, I mean it wasn't saying anything so it's not like she was interrupting his speaking…"

"No, you shouldn't put a person in a closet I mean he was just playing a game cause I mean they're not doing anything wrong when they're playing a game."

"….because they're just a robot? Umm, well kind of different with that one cause I don't know, **he seemed different in a way.** So I don't think that's really true."

"Well, Robovie wouldn't think so obviously but I don't think it would be all right even cause I think t**hey would probably find some other use for him, they could probably find some other use for him** so it's not all right."

"Yeah, that's fine. I mean if they have **no use for him**…"

"Um, I think it's alright I mean, they're **utilizing him** I guess."

"Um, I think it's alright to do to Robovie if they decide, I mean they don't want him anymore it seems kind of wasteful but I think it's alright to do that. "

"Well, I guess you could pay him but you can't really trust a robot because it could buy something bad or I don't know how it could but some people don't trust to give their, like give their money to a robot because they don't think it would use it appropriately but I don't know how it couldn't. "

"**Because I don't know.** I think it wouldn't be ok because they've, there's like a certain Robovie and I mean if they were gonna destroy it to make more that would be one thing but chances are they're not because they're gonna recycle it I guess so, and when I think of recycling I think of like using it, recycling aluminum to make more aluminum cans so **I don't**

think it’d be ok just because, I don’t know, I don’t know. I’m lost on this one, don’t know.”

Figure 8: Interview Coding Sheet

Question		Evaluation		Justification		Page
#	Content	Code	Description	Code	Description	#
1	Closet Act Evaluation					
2	Did Robovie feel that way?			----------	----------	
3	Closet Generalizability			----------	----------	
4	Game Interruption Act Evaluation					
5	Agree or disagree with Robovie?			----------	----------	
6	Game Generalizability			----------	----------	
7	Human – Closet Act Evaluation					
8	Did person feel that way?			----------	----------	
9	Human - Closet Generalizability			----------	----------	
10	Human – Game Interruption Eval					
11	Agree or disagree with person?			----------	----------	
12	Human - Game Generalizability			----------	----------	
13	Broom – Closet Act Evaluation					
14	Did the broom feel that way?			----------	----------	
15	Broom – Closet Generalizability			----------	----------	
16	Living being?			----------	----------	
17	Card Sort	----------	----------	----------	----------	
18	Intelligent?			----------	----------	
19	Robovie interested?			----------	----------	
20	Describe interaction	----------	----------	----------	----------	
21	Disagreeing, talking, neither?			----------	----------	
22	Remember shoe comment?			----------	----------	
23	NO response – how did you feel?			----------	----------	
24	NO response – why didn't you correct?			----------	----------	
25	Describe interaction	----------	----------	----------	----------	
26	Arguing, disagreeing, talking, neither?			----------	----------	

27	Agree/disagree about arguments w/robots			----------	----------	
28	Enjoy or bored by lab tour?			----------	----------	
29	Shaking hands					
30	Hugging					
31	Spend time with Robovie?			----------	----------	
32	Robovie feel sad?			----------	----------	
33	Robovie have feelings?			----------	----------	
34	If sad, go to Robovie for comfort?			----------	----------	
35	Need to comfort Robovie?			----------	----------	
36	Trust Robovie with secret?			----------	----------	
37	Robovie be your friend?			----------	----------	
38	Card Sort	----------	----------	----------	----------	
39	Memories of past experiences			----------	----------	
40	Card Sort	----------	----------	----------	----------	
41	Own Robovie?			----------	----------	
42	Card Sort	----------	----------	----------	----------	
43	Sell Robovie?			----------	----------	
44	Allowed to vote?					
45	If yes, counter probe					
46	If no, counter probe					
47	Compensation for work?					
48	Desires probe					
49	If no, agree or disagree					
50	Alien Question: warehouse					
51	Alien Question: personal maid					
52	Alien Question: home planet					
53	Alien Question: robot crusher					
54	Autonomy: other child’s claim			----------	----------	
55	Autonomy: surprised?			----------	----------	

C. CARD SORT.

Overview

The card sort task involved placing five index cards in front of the child, first placing down the card with the word Robovie on it, then placing in a predetermined random order the four remaining cards: Dog, Computer, Human, and Broom. The experimenter asked the child which of the four entities were most like Robovie, in terms of the given question. Once the child chose an entity and gave a justification for their choice the experimenter asked the child which of the remaining three entities was most like Robovie. This procedure continued until all of the entities were ranked. The four card sort questions are identified in the evaluation coding manual by the inclusion of the note: [insert card sort coding manual]. For these questions, refer to the card sort coding manual in the Card Sort subsection

Notes

1. Listen to the entire portion of the interview for the particular card sort question being coded. Try to code a primary code above.
2. Occasionally a primary code is not immediately discernable, yet the interviewer will ultimately probe out a clear, codable primary response. In these situations, only code the primary codes. In other situations, utilize the decision rules 1-7 below, when appropriate.

Decision Rules

1. Apply Rule 1 when a child chooses two entities instead of one (e.g., child says 'Both computer and broom are most like Robovie" or "Both broom and computer are most like Robovie").
    a. **Rule 1.** Code the appropriate set that corresponds with the response and place the code in the two consecutive positions (e.g., place code for Computer and Broom in the first/most like position and in the consecutive position, second most like).

2. Apply Rule 2 when child chooses not to answer or is unable to choose an answer. (e.g., child responds "I don't know," "I'm not sure," or "I don't want to answer." Or the child is able to place entities in the first and second positions but not in the third and fourth positions.)
    a. **Rule 2.** Code "Does not answer"

3. Apply Rule 3 when child answers a different question.
    a. **Rule 3.** Code "Uncodable"

4. Apply Rule 4 when child gives a codable response but later changes his or her answer (e.g., child responds Human, Dog, Computer, Broom and then decides that the order is Computer, Human, Dog, Broom).
    a. **Rule 4.** Code the order that the child ultimately settles on (e.g., in the example above the latter order should be coded).

5. Apply Rule 5 when child gives two answers to the question in terms of the ordering of the entities: one answer pertaining to the true world and the other pertaining to a hypothetical world.
    a. **Rule 5.** The order pertaining to the true world trumps that of the hypothetical.

6. Apply Rule 6 when child appears to understand poorly the question even after the interviewer has made several attempts to clarify (e.g., child responds “well, a human can own Robovie so I pick human first”).
    a. **Rule 6.** If the child is able to formulate a decision for the order of the entities then code that order. The coder’s interpretation of the child’s understanding of the question is trumped by the child’s ability to formulate an order.

7. Apply Rule 7 when child agrees (e.g., answers "yes" or "yeah") with the interviewer after the interviewer has paraphrased the child's ordering; but the child did not actually provide the language to establish that order (e.g., the child talks out his or her ideas and opinions regarding the question and the interviewer paraphrases by saying "so you believe the broom should be third and computer should be placed last?" and the child responds "yes").
    a. **Rule 7.** Code the order as established by the interviewer and agreed upon by the child (e.g., in the above example, the broom would be coded third and the computer would be coded fourth).

Card Sort Coding Categories

1. Human.

2. Dog.

3. Computer.

4. Broom.

5. Both Human & Dog.

6. Both Human & Computer.

7. Both Human & Broom.

8. Both Dog & Computer.

9. Both Dog & Broom.

10. Both Computer & Broom.

11. Does not answer.

12. Uncodable.

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