Out of the Chinese Room

Earl, a philosopher, decides to relax after a long morning of intense thought. He ventures into a nearby park, where he meets a robot who, Earl is surprised to discover, has many of the skills usually thought to belong only to intelligent beings. For example, the robot can carry on discussions on a variety of topics, speak both English and Cantonese, and express what appears to be at least a polite appreciation of Earl's attempts to do card tricks. Earl tests the machine's knowledge of the present state of research in artificial intelligence, and he is very much impressed with the robot's extensive bibliographic awareness.

As the afternoon wears on, Earl becomes hungry, so he invites the robot to accompany him to a nearby restaurant. They slide into a comfortable booth, and just as their conversation about artificial intelligence resumes, the robot suddenly pauses, then reaches up to its neck, grabs a flap of plastic/metal skin and pulls it upwards, like a man pulling off a mask. Indeed, it is a mask! Underneath is revealed Roger, a local computer scientist.

"Whew!", Roger exclaims. "It sure is hot under all that." He takes notice of the table and Earl sitting on the other side. "Oh, hello", he says. "Where am I?" He begins to unzip/unhook/unfasten the thick, plastic and metal skin and wriggle his way out of it. He is dressed in blue jeans and an old shirt.

Earl stares, dumbfounded.

Roger continues talking, perhaps only to himself, as he sheds the robot suit. "I'll have to get those guys to make this breathe better. I'm sweating all over."

"What?" That's all Earl can manage to say.

"Name's Roger." He offers his hand. (Earl shakes it without being fully aware of doing so.) "How did I come to be here?"

"You . . . er . . . you walked in with me", Earl says.

"I did? What luck. I'm starved."

"You don't remember?"

"Remember? I remember what went on under this thick skin. But of course I wasn't aware of what was going on outside of it."

"How could you not be aware? You talked to me. We walked for a while in the park. We came here for something to eat."

"We did? Marvelous! I've got the rules down right, then."

"What rules?"

"I guess I'll have a hamburger."

"What rules?"

"A program. Of sorts."

"A program?"

"Well, my co-workers on this project gave me a long list of rules. I like to call it my program. I do software development, but I'm not very knowledgeable in the hardware side of things, so I don't know how this robot suit actually works."

"What rules?"

"Rules! Rules! I memorized them all. Or anyway most of them. I get into this robot suit, see? And then I start receiving a stream of symbols. I don't know what they all mean. Some are sounds, some are patches of light. Some are pressures on various parts of my body. Some are odors. The whole bit. They're meaningless to me. As I say, I didn't

build this contraption. But anyway, I get these symbols, and then I do things to them according to the rules I've memorized, and then I send the results out. I can tweak a little dial here, or push a button there, and so on. There are thousands of these dials and buttons inside this suit. I don't know what they all do." Roger holds up the remains of the robot face mask. Sure enough, the inside is covered with all sorts of instruments and dials and switches. Earl wonders how they were activated. Perhaps Roger had a way of reaching up into there with his arms.

Roger continues. "I assume they make some sort of difference in the outside world. But who knows what? Maybe one dial controls an arm. Maybe another controls a finger. And so on. The voice is actually my own, although I only speak in restricted phonemes according to the rules I have. I don't know whether I'm actually saying anything. They tell me they'll have a voice synthesizer hooked up later on. So anyway, I'm glad to know I didn't walk out in front of a truck or something. This has really been an adventure."

"Extraordinary!", exclaims Earl. "Do you mean that you control this . . . this thing, but you don't know what it does when you control it?"

"Sort of. I'm not really sure I control it, actually. All I know is that I get certain meaningless symbols as input, presumably from the sensory apparatus of the suit, the eye cameras, the ear microphones, and so on. Then I look up the rule that applies, and then tweak whichever dial or make whichever sound the rule says." He looks around the restaurant. "And here I am!"

"That's a bit difficult to believe", says Earl. "You spoke a little Chinese to me earlier . . . er . . . as the robot. Are you telling me that you don't know any Chinese?"

"Chinese? Was I really? Wow! No, I can't speak any Chinese at all. Although, to be frank, I wondered if some of the sounds I was making might be Chinese. But I wasn't sure. I certainly couldn't distinguish between, say, Cantonese and Mandarin. All I do is follow the rules. Were the sounds I was putting out respectable Chinese? I've been practicing all my rules very conscientiously; I have most of them memorized. Still and all, no matter how proficient I get, I don't ever understand these sounds and what they mean."

Earl, who speaks fluent Cantonese, finds Roger's denials implausible, and so he decides to test Roger's proficiency in the language. Would Roger be able to respond in meaningful ways, in Cantonese, to questions about a little story told in Cantonese? [*In the following dialog, sentences in this font are translations from the Cantonese—for your benefit, dear reader. Other sentences are in Roger's native English.*]

"*A man went into a restaurant*", says Earl (in Cantonese) "*and ordered a hamburger. When the hamburger came, he was very pleased with it, and as he left the restaurant he gave the waitress a large tip before paying his bill. Now I want to ask you some questions about what I have just told you.*"

"*Ready*", says Roger (also in Cantonese).

"*Do you suppose the waitress was the one who brought the hamburger?*"

"*That's the usual way.*"

"*Do you suppose the man actually ate the hamburger?*"

"*I guess so.*"

"*Why might the man have given the waitress a large tip?*"

"*Because he was pleased with the service, I guess.*"

"Well, well", says Earl, switching back to English. "You really do understand Chinese. And self-taught, too!"

"Oh, but I don't understand it. I just give responses according to certain input and certain rules. My 'program', if you will."

"But don't you realize that you were hearing a story about restaurants and that you were responding appropriately to questions about the story?"

"Restaurants? Was all that about restaurants?"

"But surely, Roger, you understood that!"

"Frankly, I understood nothing."

"Very odd. Let me ask you some more questions in Chinese."

"OK."

"*Why do people leave tips in restaurants?*"

"*For a variety of reasons. One is that in many cultures, leaving tips is simply a convention, and people often observe conventions without even thinking much about it.*"

"*Do you think the man in the story I told you left a large tip without thinking about it?*"

"*No. Probably he intentionally left a large tip as a reward for the waitress's fine service.*"

"*Why a large tip? Why not a small one?*"

"*The convention is that the more pleased you are with the service, the larger the tip you might leave.*"

"*If I had not told you that the man was pleased with the hamburger, then when I told you that he left a large tip, would it be a fair inference that he was pleased with the burger?*"

"*Hmm. Perhaps. But of course he could have been pleased for other reasons. Or maybe he just had the habit of always leaving large tips.*"

"*What is a tip, anyway? Is it a bit of advice, or what?*"

"*You're playing with words, Earl. 'Tip' is ambiguous. In the story you told, we are led to believe that the tip he left was money; perhaps it was a certain percentage of the bill.*"

"*What percentage of the bill might he have left as a tip?*"

"*That all depends. These days, and in this culture, around 15 percent of the bill is not an unusual tip. If he left a large tip, then maybe he left about 20 or 25 percent.*"

"*What's the cost of a hamburger these days?*"

"*Depends on the kind of restaurant it is. Anywhere from, say, one dollar to five dollars, I guess.*"

"*Do you like hamburgers?*"

"*Me? Yeah, I like them a lot. I consider them the perfect food.*"

"Well!" Earl switches back to English. "It's quite clear to me that you certainly speak Cantonese as well as any native."

"I do? But I still didn't understand what we were talking about!"

"Oh, now! You are joking."

"No, I'm serious. I haven't the faintest idea what we were talking about."

"You are one for the jokes, aren't you! You told me about tipping practices and that you love hamburgers."

"I did? But I insist that those funny sounds coming out of my mouth were Greek to me. I mean, I didn't understand a word of it."

"Perhaps you ought to say you don't *remember* what you said."

"No, I remember perfectly well. For instance, one group of sounds was: '*These days, around 15 percent of the bill is not an unusual tip.*' And another set of sounds was: '*Anywhere from, say, one dollar to five dollars.*' I remember making those noises. But I don't know what they mean."

Earl quickly switches to Cantonese. "*You're telling me that you speak perfect Cantonese, but you don't understand any of it?*"

"*That's right*", Roger responds in Cantonese. "*Not a word.*"

"*And you don't understand what we're saying right now?*"

"*Nope. What are we talking about?*"

"*We're talking about understanding.*"

"*Could have fooled me. We could be talking about restaurants, for all I can tell.*"
"*We were talking about restaurants!*"
"*Eh? I thought you said we were talking about understanding.*"
"*Both. First restaurants, then about understanding.*"
"*Oh, I see.*"
"*So now you understand?*"
"*Not a word.*"
"*You claim you really don't understand the sentence I am now asking you?*"
"*Haven't a clue. Curious, isn't it?*"

Earl gives Roger a quizzical look and shakes his head. "What an odd sense of humor", he mutters to himself. "Computer hacks!"

"*Philosophers!*", sighs Roger, sotto voce in Cantonese.

"Look here", says Earl, somewhat frustrated. "It's just impossible to manipulate strange symbols merely according to a list of explicit rules and have the results be indistinguishable from a native speaker's. Maybe you could respond with a word here, a word there; maybe you could make some simple syntactic changes in the input sentences and send them out as seemingly appropriate responses. But those would be cheap tricks, and it wouldn't take too long to discover them. And besides, you couldn't have all the rules necessary. There are just too many of them. In fact, most conversations can't be formalized in rules at all. So if you really do produce responses as good as a native speaker's—and I mean over a period of time on a variety of subjects—then you must necessarily understand the language."

Roger thinks about that. "Perhaps I am only a robot, controlled from within by some intelligent creature who does know Chinese. Perhaps this creature will unzip my skin, which is only a fake covering, and reveal himself to you. Who knows?"

"No, I'm confident it's the real you this time. Anyway, surely you would know if you were in control."

"Well, not so fast. Take this robot—I mean the robot you thought I was before I emerged. Can you honestly say that he—or it—knew, somehow, that it was not in control, but was being controlled by an intelligent being hiding inside of it?"

"But that's different. Now I know that you were in control all along."

"Yes", Roger says. "But I mean before you found that out. Don't tell me you weren't fooled."

"I was, yes."

"Well, then. There you are. Maybe he was too."

"But", sputters Earl, "you can't fool something which is not itself an intelligent being. That's a good test: if you can fool it, then it's intelligent. Kind of a backwards Turing's test. A rock might fool you, but you can't fool a rock. Maybe the fake robot outfit fooled me, but nothing fooled the outfit, because it is not the sort of thing which can be fooled."

"Tut, tut", Roger says. "By your own account, you did a card trick for the robot. The robot was fooled. I certainly wasn't fooled, because I didn't even know what was going on. I just happened to be inside the suit, manipulating symbols which I did not understand. So the robot was fooled by your card trick. Now, why couldn't the robot, just like you, have been fooled by his own robot suit and so on?"

"No", says Earl. "That's like chiseling a rock to look like a man and then expecting the rock to be fooled into thinking that it is a man. Besides, I didn't fool the robot. I was fooled into thinking that I fooled it. The robot itself was just a machine—a facade which you were controlling."

“Methinks you are in the grip of an ideology. You had lots of evidence that the robot was an intelligent being: it walked, it responded appropriately to its environment more or less as you did, it carried on a conversation, and so on. Furthermore, nothing in your experience of the robot gave you any evidence whatsoever that it might not be an intelligent being, except maybe its appearance. But I don’t think you want to be a racist—or rather a species-ist. Or something.”

“But there is something in my experience of the robot which counts for its not being an intelligent being”, Earl protests.

“Oh, yes?”

“Yes. When you took off the suit. Then I knew that I had been fooled.”

“No, no. That’s your ideology speaking again. Why should your understanding of the inner workings of something suddenly be some kind of proof that that something did not behave in the way you experienced it? Just because you understand how a light bulb works doesn’t mean that the light bulb doesn’t give off light. Just because you understand something of the neurophysiology of the human nervous system doesn’t mean that humans aren’t intelligent. And, similarly, just because you know something of the mechanism of this robot suit doesn’t mean that the robot didn’t act intelligently.”

“Didn’t *act* intelligently”, Earl says, wagging his finger in the air. “But acting intelligently and being intelligent are two different things.”

“Depends”, says Roger. “Depends on how well it acts. A duck which acts exactly like a light bulb in all respects just is a light bulb. And probably not a duck, since it doesn’t act at all like one. A robot shell which acts in all ways like an intelligent being surely must be an intelligent being, no?”

“But it doesn’t act in all ways like an intelligent being. Just look at it now.” Earl rises slightly and points over the table to the crumpled suit.

“So it’s asleep.” Roger shrugs his shoulders and looks down at the suit beside him. “Or dead. And anyway—.” Roger suddenly breaks off when he sees Earl’s face become contorted in a strange, strangled way. Earl’s hands fly up to his face. A soft moan escapes from deep within his throat. His hands grip his head tightly and twist it. Roger leans back in horror at the sight. Earl’s hands are still twisting his head, which revolves completely around several times, as though it were being unscrewed. But there are no noises. No cracking of bones. No ripping of tendons. No blood. Earl’s hands push the head up, which suddenly comes off the torso with a gentle “smock” sound. The torso is hollow! The head of a man emerges from the hole. It speaks.

“*Whew!*”, it says, in Cantonese. “*It’s awfully hot in there. Where am I?*”

“Holy cow!”, exclaims Roger, in English. “Who are you?”

“Oh”, says the man. “You speak English. How do you do. My name is Chiweh.” He fumbles for a hidden zipper and begins taking off the plastic skin of a philosopher. “Only I wish you spoke Cantonese, because I do not understand English.”

“But you’re speaking English right now”, says Roger.

“I am? That is wonderful. Actually, I am only responding to sounds according to certain rules which I have memorized. I do not understand a word of what I am saying.” The plastic suit is finally off. Chiweh peers over the table and notices the discarded robot suit on the seat beside Roger. “Well, I’ll be! You too?”

“Isn’t it curious?”, asks Roger. “A short while ago I was manipulating a robot suit, just as you were manipulating an Earl suit. And I don’t understand Cantonese, but I can respond to it just as you respond to English.”

Chiweh is almost gleeful. “How very wonderful”, he says. “Which language should we use?”

"It doesn't much matter, I suppose", says Roger. "One of us is going to be left out in either case."

"Yes, I suppose so. I guess that means we cannot have a conversation about philosophy and artificial intelligence, and things like that."

"I guess not. How about a hamburger?"

"Splendid."

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