Questioning and Responding Strategies: Lessons from Pop-Sci Talk Shows

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Abstract

Many EFL and EAP teachers are not aware of the linguistic mechanisms and academic conventions used in academic talks, so they can give only limited guidance on preparing for academic discussions. This paper investigates the questioning and responding strategies used in two academic talk shows in the light of conversation analysis. In one, a journalist talks with a well-known physicist Michio Kaku; in the other, a talk show hosts the social science researcher Uval Noah Harari. Both shows aim to present academic knowledge to a non-specialist audience. The questioning and responding strategies used in both shows are found to vary by academic discipline and personal preferences. It is also shown that professional participants in both speech events use many strategies not introduced in classroom pedagogy in similar ways, such as seeking clarification, self-questioning and dodging questions. EFL and EAP students could be introduced to the strategies used in academic talk shows in order to apply them effectively in their academic talks.

Keywords: questioning strategies, responding strategies, popular science, talk shows

Introduction

The skills required for EFL and EAP students to participate in an academic discussion are not commonly endorsed in EFL coursebooks, which mainly treat the subject in a superficial way, for example by rote-learning sample verbal expressions. This does not support developing competencies of critical and creative thinking which are expected in tertiary education. The two skills can be developed through interaction, supported by the interaction hypothesis in language learning (Long 1996) which holds that language proficiency can be promoted by face-to-face conversation and that learners learn best when they interact (Vygotsky 1986). Interaction can be observed naturally in forming questions and responding to them. Both are observable in the light of conversation analysis with the focus on Sacks, Schegloff & Jefferson's (1974) original turn-taking sequences and adjacency pairs.

However, most studies on questioning and responding patterns and techniques involve the subject areas of communication arts (e.g. Gabrielsen et al. 2017, Gialabouki & Pavlidou 2019) and pragmatics (e.g. Channon et al. 2018, Thornborrow 2007). This study attempts to shed new light on English language education with a focus on questioning and responding techniques in interaction in academic conversation. The patterns and techniques revealed are given as guidance for classroom speech preparation and awareness raising. It is hoped that the findings from this study can help scaffold EFL and EAP students who are developing interaction strategies in academic talk.

The idea of this study originated in a problem I encountered when co-teaching an EFL/EAP course at tertiary level. One of the activities required that students prepare a script of an academic talk show with the aim of reviewing English vocabulary and expressions from previous classes.

In performing such an activity, students are left on their own to figure out how the oral discourse of such speech events should be structured. Teachers, being unaware of the

natural questioning and responding patterns in academic talk shows, are simply told to check their students' prepared scripts for grammatical and typographic correctness. The problem is that teachers were not able to give guidance on how questions should be formed, and how recipients should react to them naturally. Unsurprisingly, the prepared scripts were banal and full of unnatural alternating lines of questions and answers, most of which were not mutually coherent. This was even found among the more advanced students. Examples of their prepared scripts are shown below.

A: How did you two meet together?
B: We met at work. She was having …
A: What do you think about teenager's eating habits today?
B: I think they don't think about food nutrition. …
A: Where can we find health food to eat?
B: You can …

The alternating short lines of questions and answers make the speech appear more like a job interview or a police investigation than an academic talk. There are no attempts to dominate turns, raise doubts, avoid confrontation or show full commitment to their statements, which are typical phenomena in academic discussion. Furthermore, there was no evidence of adoption of 'cooperative' interviewing techniques which require more interactive skills, instead of 'confrontational' ones which they seem to be more familiar with in classroom language (Black & Yeschke 2014: 127). The study of discourse structure in natural academic talk seems to have attracted limited attention in language pedagogy as the topic is generally taken for granted and assumed to be part of the work in journalism and communication arts. Students in such classes need scaffolding in the idea of how scripts for talk shows can be prepared before they are asked to fulfill the task. EAP teachers need to raise awareness of natural academic interaction. This cannot be done without adequate research and conversation analysis of academic oral interaction.

Review of Literature

Popular science (also called pop-sci) presents scientific subject matter to a general non-specialist audience while at the same time maintaining the academic nature of the genre. The goal of a popular science text or talk is to digest the accuracy and complexity of scientific knowledge in order to make it more accessible to lay audiences. It is this facet of the genre that adds to the traditional academic talk as it aims to entertain albeit still academic. In writing, this can be seen in books, articles in newspapers, magazines or internet online postings. In speech, this may come in the form of talk shows on TV or internet online channels and radio phone-ins. These are contributed by scientists, journalists and public communicators. Examples of this genre include, for example, Stephen Hawking's 'A Brief History of Time' and Uval Noah Harari's 'Sapiens', both of which are bestsellers written for a general audience.

Popular science in fact is not a new genre of knowledge presentation, as this way of communication dates back to ancient times when knowledge was narrated through memories and storytelling. However, it has been made popular today by the arrival of social media online platforms where academic and scientific knowledge is no longer confined to academia but spread to all via smart phones. Popular science is selected in this study because the subject matter in the students' language coursebook belongs to this genre. All the reading passages in the book are related to scientific knowledge simplified and narrated in a reader-friendly way for general EFL and EAP learners. The topics include, for example, new scientific discoveries, technologies, ecology and food science.

Turn-Taking in Conversation Analysis

Conversation analysis (CA) is a method that has been used widely in analyzing both institutional talk such as courtroom discourse (Komter 2013), investigative interviews with refugees (Channon, Foulkes & Walker 2018), police investigations (Black & Yeschke 2014) and non-institutional talk such as media interviews (Gialabouki & Pavlidou 2019) and television talk shows (Ilie 1999, Thornborrow 2007). Conversation analysis is rooted in the study of turn-taking (Flowerdew, 2013: 119), and turn sequence structure is strongly related to the roles of the speaker in initiating statements which in turn trigger responses. A turn-taking sequence is made up of at least a pair of turns, the so called an adjacency pair (Sacks et al 1974). The first pair part triggers the second pair part. For example, when one participant is responsible for, or in the role of asking questions, the other is responsible for answering them. Likewise, when the first pair part is initiated in the form of request, the expected second pair part can be perceived either as acceptance or denial. The role of a questioner or first pair part contributor is therefore more powerful as he or she determines the topics and structures the conversation (Channon et al 2018: 155). However, their roles can be switched unpredictably and this can be done through a variety of linguistic signals.

The fuzziness of the turn exchange structure of a talk show is that the first-pair part of an adjacency pair may not be a direct question, while the second-pair part is not necessarily an answer (Ilie 1999: 984). There is also the possibility of role-switching in talk shows (Ilie 1999: 985). Questions may also be asked by the show guest, whose main role is actually a respondent, while the show host may decide to respond to the question or stick to his or her role as a questioner. The unpredictable turn sequence and role-switching marks a clear difference between the natural professional talk show and the scripted talk show performed by English language learners, such as can be observed in a typical language classroom.

The Action of Questioning

Defining and classifying questions is not easy as there are many kinds, and different persons exploit different strategies in raising questions or eliciting information. For example, despite their interrogative grammatical forms, some questions are rhetorical in function, so they are used for strategic purposes rather than to genuinely seek information. Some statements in the guise of their declarative forms may function pragmatically as questions as they effectively trigger replies in the subsequent turns. In what follows, definitions of questions from previous studies are reviewed along with their classifications.

Linguistically, the term 'question' refers to canonical interrogatives noticeable by the grammatical sentence forms of yes-no and wh-questions. In spontaneous conversation, questions are not easy to define because they come in a variety of forms. While the prototypical function of questioning is to seek information, questions can be used to initiate or develop a topic for discussion and interaction (Albergaria-Almeida 2010), make an offer, an invitation, a request (Schegloff 2007) or challenge the claims or views expressed by interlocutors (Heinemann 2008, Hayano 2013). For these reasons, directives including commands and requests are also regarded as questions. In conveying politeness, questions may come in the guise of requests as in *'Could you please elaborate on …?'* which actually is a question (Brown & Levinson 1987) so such a statement is included as a question in this study.

Besides, questioning also includes any form of declaratives whose function is to demand verbal response or a second pair part with expected information (Black & Yeschke 2014: 129). Comments, for example, can be regarded as questions if they invite the interlocutor to respond. This broad definition of the term is generally shared by researchers (e.g. Channon et al. 2018, Black & Yeschke 2014: 129). Analysis of questioning patterns in educational context even goes beyond interrogation, as it includes any form of statement

which aims at evoking not only verbal feedback but also non-verbal reaction (Albergaria-Almeida 2010: 752). Questions therefore include not just interrogatives but also directives and declaratives that aim to evoke verbal responses.

The method of questioning is therefore a rhetorical strategy worth exploring as the choices made by the questioner determine the interviewee's response and willingness to cooperate. In turn, the response received by the interviewer also shapes the direction of subsequent questions (Black & Yeschke 2014: 136). Several researchers have classified questions and responses to questions differently. In what follows, different kinds of questions will be reviewed in order to shape the framework for the present study.

Table 1: Comparative view on studies of question types

Ilie (1994)	*Sternberg & Spear-Swerling (1996)*	*Ilie (1999)*	*Black & Yeschke (2014)*
- information-eliciting	(standard)	(non-standard)	- closed/pointed/direct
- argument-eliciting	- didactic	- Expository	- open/indirect
- answer-eliciting	- fact-based	- rhetorical	- Reflective
- action-eliciting	- thinking-based	- echo question	- leading/directive
- mental response-eliciting			- self-appraisal
			- diversion

Many expository questions in academic talk are intended for raising arguments, rather than seeking information. There is a fine line between information-eliciting and argument-eliciting questions (Ilie 1994). At times the same sentence conveys both functions, so such classification can hardly be applied for finding frequencies regarding different types of questions. Sternberg & Spear-Swerling (1996) turn instead to clear-cut standard questions and distinguish between fact-based and thinking-based questions. In pedagogical contexts, they add a didactic question, one that is aimed at stimulating learners to reflect on ideas, learning and new understandings. However, this kind of question, commonly found in educational situations, is not likely in the event of academic talks where participants are viewed as equals. Several more types of non-standard questions are added in Ilie's subsequent framework (Ilie 1999) including rhetorical and echo questions. Echo questions are merely repetition of a previous speaker's question, and are often used as a means of initiating repair. At times, they come in dual functions, either to confirm previous utterances or draw attention to the foolishness of an underlying propositional statement (Ilie 1999, Channon et al. 2018: 158). Rhetorical questions are raised with the intention to provoke thinking rather than to seek an answer from the hearer.

More question types are given by Black & Yeschke (2014). Their broad classification distinguishes between direct and indirect questioning. Direct questions are detailed and specific in nature, seeking for information, facts or opinions, from the interviewees straightforwardly, e.g. "What is quantum computing?". Indirect questions provoke less stress and less defensiveness on the part of the interviewee simply because the question is packaged to be polite and less intrusive. This kind of question helps the interviewee save face and hence allows him or her to express more, e.g. "well, you might say …". The indirect type also includes that of reflective questions, leading or directive questions, self-appraisal and diversion. Reflective questions function to mirror the interviewee's comments. This may be used to summarize the topic of the talk, or strategically before formation of the subsequent questions where the interviewer can later convey objection, e.g. "let me see if I've got this right …" or "so, what you're saying is …". Leading or directive questions contain some degree of shared assumptions with the interviewee by inviting him or her to elaborate or

explain more about the topic in question. They allow the questioner to convey acceptance of the individual, and therefore guide the respondent toward cooperation and rapport.

As Black & Yeschke (2014) seem to focus more on official confrontational interviews, some open types are irrelevant in academic talks. Self-appraisal questions, the kind of question that allows the respondent to evaluate or judge himself, are common in police investigations, so are not included in this study. Diversion questions, an interviewer's shift of topic when dealing with emotional interviewees, are unlikely in academic talk, where it is more likely the hearer who tries to divert from the focal point of the question, not the questioner. Diversion techniques when used by the hearer are related to evasion, and this will be discussed in the next section. Another type of question noted by Gialabouki & Pavlidou (2019) is the freestanding question, that is the question raised by the message recipient rather than the questioner in order to allow elaboration by answering the question. This has a range of functions: initiating repair, requesting the floor, inviting the interviewer's support, and most prominently challenging the interviewer. (Gialabouki & Pavlidou 2019: 19).

Responding to Questions

In the preferred turn-taking sequence, the action of questioning stimulates the action of giving answers, i.e. in the form of a question-answer adjacency pair mentioned earlier. However, respondents may be reluctant to respond to questions immediately, in which case these questions are often followed by justification, pauses or hesitation markers (Channon et al 2018: 158, Heritage 1984). There are also times when questions are met with complete silence, a dispreferred consequence, resulting in failure in communication.

During media interviews, for example, it was found that interviewees may *"answer without answering"* by using an evasive rhetorical strategy as part of a defensive mechanism (Gabrielsen et al. 2017). Recipients have a few choices in responding to questions. The preferred response is to reply, directly or indirectly. Direct replies are responses to questions being asked while indirect ones can be observed through evasive acts. Evasive answers appear in three ways, according to Gabrielsen et al. (2017). The first one is a shift of time, that is when a question about actions in the past is met with an answer concerning the present situation or vice versa. The second one is a shift of agent, that is when a question directed at an individual person is met with an answer that can be generalized to the public audience or vice versa. The last one is a shift of level when the focus of an answer is widened or made narrower than the original scope of the question. Relying on the above strategies helps the interviewee to abide by his or her role as a message recipient following the question-answer adjacency pair, but at the same time remain reserved in giving direct answers or opinions.

Certainly, interviewees are willing to respond to questions for which they know the answers. They feel more comfortable to talk when the topic is familiar to them. At the same time, they tend to avoid direct answers for questions that make them appear foolish or uninformed (Black & Yeschke 2014: 128). With multiple questions, Clayman (1993) finds that skilled evasive interviewees may choose to respond only to the first question in a sequence and avoid answering the second one. This is because the first question is broad as its function is merely to introduce the topic while the second narrows the focus, thus making it more difficult to deal with (Channon et al. 2018: 158).

Research Questions

1 What are the frequencies and varieties of questioning strategies exploited in pop-sci talks?
2 What are the frequencies and varieties of responding strategies exploited in pop-sci talks?

Methodology

Data were collected from the two video clips of two professors' pop-sci talks available on youtube online channels. In the first video clip, Bari Weiss, the American editor of The New York Times, interviews Professor Uval Noah Harari, an Israeli historian in the Hebrew University of Jerusalem (www.youtube.com/watch?v=Vxvb7Nw9JCE). In the second, another American journalist interviews Professor Michio Kaku, an American theoretical physicist from the City College of New York (www.youtube.com/watch?v=eMxmDPDyQ7o). The two professors were chosen because both are university professors, pop-sci writers and media communicators. They can explain academic content to lay people effectively, so they often feature on talk shows around the world. Their talks are therefore viewed as good representations of pop-sci talk for media and general audiences. In other words, they are good at making difficult scientific knowledge understandable for public audiences, as evidenced by their worldwide bestselling books and video footages on youtube.

Both Professor Harari and Professor Kaku are bestseller authors having published a series of popular science books on related content but from different angles, soft and hard science. Professor Harari's bestsellers are 'Sapiens' (2014), 'Homo Deus' (2016) and '21 Lessons for the 21st Century' (2018). Professor Kaku's bestsellers include, for example, 'Physics of the Future' (2011), 'The Future of the Mind' (2014) and 'The Future of Humanity' (2018). Both are considered by the media as futurists based on the books they have written which were published around the same time. The roles of the two academic figures complement each other as one is a pop-sci communicator representing communication in soft science, e.g. history and philosophy, and the other a pop-sci communicator representing hard science disciplines, e.g. physics and cosmology. This way of complementation and comparison allows us to observe the different nature of the talk between different disciplines in the same area: futurity of humanity.

The subtitles and timing available on the youtube video allow the researcher to see clearly when questions were asked, attended to or interrupted in time. Content analysis was carried out using the analytical framework arising from previous studies on conversation analysis (CA) focusing mainly on the patterns of questions and responses during media talk shows.

Professor Harari's Times Talk was abridged from the original 71:26 to 39:43 minutes to make it comparable to Professor Kaku's Google Talk which lasts 39:27 minutes. The adjustment was made by removing the MC introductory talk, only available in Times Talk not in Google Talk. Topics of nationalism, social manipulation and global cooperation in Times Talk were half removed as they appeared repeatedly. By doing so, the two talks are comparable in terms of frequencies of linguistic features without their raw occurrences being normalized. This is shown in the Table 2 below.

Table 2: Total number of words and amount of talk time

	Prof Harari's Times Talk	Prof Kaku's Google Talk
Text size	5,845 words	6,204 words
Talk time	39:43	39:27

The following analytical framework is adapted based on the previous conceptual frameworks found in Sternberg & Spear-Swerling (1996), Ilie (1999), Black & Yeschke (2014) and Gialabouki & Pavlidou (2019) reviewed earlier. As a pop-sci talk show is considered semi-institutional discourse, the framework need be integrated incorporating both the formal or standard and less formal or non-standard types of questions. Sternberg & Spear-Swerling (1996) and Black & Yeschke (2014) focused on official investigation, so they did

not include non-standard types of questions shown in Ilie (1999) which focused on less formal types because her study was on TV talk shows. Gialabouki & Pavlidou (2019) do not provide a full classification of question types in their study, but they raised the significant role of freestanding questions in informal talk, so this freestanding type in included. Among all these frameworks, that of Gabrielsen, Jønch-Clausen & Pontoppidan (2017) is the one that deals only with responding strategies, so their framework is integrated in this study.

Table 3: Analytical framework of questioning and responding strategies

Code	*Questioning strategies*	host	guest
RF	*Reflective* - reflecting on a speaker's comments, not necessarily done in an interrogative form. (e.g. So, what you're saying is …)	☐	☐
DI	*Direct* - eliciting unknown information straightforwardly through an interrogative statement. (e.g. Were you part of the team?)	☐	☐
ID	*Indirect* - eliciting information indirectly, not necessarily in an interrogative form, such as by making a relevant statement to urge a hearer to respond. (e.g. But people might disagree and say that …)	☐	☐
LD	*Leading* - referring back to previous information to ask for confirmation, elaboration or to support it with expectation. (e.g. You said that …)	☐	☐
	Responding strategies	host	guest
NR	*No response* - ignoring the question (e.g. keeping silent)	☐	☐
DR	*Direct response* - giving a direct answer for the question (e.g. Yes, that is Einstein's equation.)	☐	☐
DK	*Don't know* - saying that one does not know or nobody has the answer (e.g. I don't think anyone has the answer.)	☐	☐
EV	*Evasion* - not giving a direct response, shifting topics (e.g. time, agent, level) (e.g. Well, I don't think we have enough time to …)	☐	☐
FR	*Freestanding* - asking questions that are followed by answers given by the speaker himself in the same turn (e.g. What is a blackhole? A blackhole is …)	☐	☐
EC	*Echo* - repeating the question by oneself (e.g. What do I think about futurity?)	☐	☐
RH	*Rhetorical* - asking questions that provoke thought rather than answer (e.g. Can you believe that … ?)	☐	☐

With the focus on turn sequence and adjacency pairs, the present study analyzes the recurrent patterns of questioning and responding strategies throughout the academic talks as shown in Figure 1. As self-questioning, initiated, completed and used rhetorically by the speaker, is a kind of repair in casual talk (Flowerdew 2013: 131), this is categorized as part of a responding strategy rather than a genuine question.

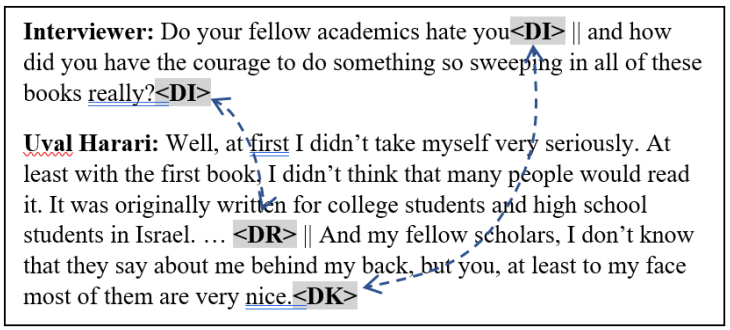

Figure 1. Sample of data analysis (1)

In the above example, the multiple questions raised by the interviewer were responded to differently. The first question was attended to directly; the second indirectly by the recipient's avoiding the yes-no answer. Various recurrent questioning and responding patterns were observed by text annotation using the tagsets from the analytical framework. Different strategies applied by the speakers were counted for frequencies. Salient features are categorized, shown in examples and discussed in detail.

Just as the first pair-part may contain multiple questions as shown above, so the second may come with many responses, so questions and responses cannot be enumerated per utterances or turns, but based on meanings in discourse as shown in the following example.

First pair-part: Initiation	Do you think we will ever leave Earth forever?<**DI**>	This turn contains a direct question.
Second pair-part: Response	I think at some point, we may have to leave the Earth forever. In five billion years, the sun will expand. The mountains will melt. The oceans will boil. … We have to.<**DR**> || … And in fact, 99.9% of all lifeforms go extinct. How do we prove that?<**FR**> Just dig right under your feet. Right under your feet are the bones, the bones of 99.9% of all species that have ever existed on the planet Earth. Extinction is the norm for life. We forget that. … It's the law of physics.<**DR**>	This turn can be divided into two semantic units: - A direct 'yes' answer. - An elaboration where freestanding question is used, followed by a self-reply.
Follow-up	Thank you	Not counted

Figure 2. Sample of data analysis (2)

The above turn exchange structure can be divided into three parts: initiation, response and follow-up, according to Sinclair & Coulthard (1975). Questions and responses are counted per their occurrences based on contextual meanings as shown by the tagsets in triangular brackets <…>, while follow-ups are not included. Questions in narratives are also not counted, as they are not aimed at getting any responses from the interactant. The symbol || is used to separate between different semantic units within a turn. Most semantic units are separable in linear pattern, while only a few of them are embedded within an utterance. Each question or response in a semantic unit, separated or embedded, is counted as one occurrence. In the above Figure 2, there are one direct question, one freestanding question and two direct responses.

Results and Discussion

In preliminary findings, the number of questions asked by Prof. Harari's interviewer was more than the questions asked by Prof. Kaku's interviewer (44 vs 27 questions). The difference is clear in all kinds of questions. While the number of Prof. Kaku's responses was greater (67 vs 46), a clear difference was found in their number of indirect responses. Prof. Harari dealt with many questions he received indirectly, whereas Prof. Kaku opted for direct responses and self-questioning techniques in most turns.

Table 4: Comparative frequencies of questioning and responding strategies

Questioning strategies	A talk with Prof Harari		A talk with Prof Kaku	
	Host	Guest	Host	Guest
Reflective (RF)	1	-	-	-
Direct (DI)	24	3	18	5
Indirect question (ID)	9	-	3	-
Leading question (LD)	10	-	6	-
Total	*44*	*3*	*27*	*5*
Responding strategies	**A talk with Prof Harari**		**A talk with Prof Kaku**	
	Host	Guest	Host	Guest
No response (NR)	-	-	-	-
Direct response (DR)	3	23	-	34
Indirect - Don't know (DK)	-	8	-	1
- Evasion (EV)	-	6	-	3
Self-questioning - Freestanding (FR)	-	-	-	26
- Echo (EC)	-	7	-	-
- Rhetorical (RH)	-	5	-	8
Total	*3*	*49*	-	*72*

By comparison, we see that questions for Prof. Harari included direct, indirect and leading questions, while most questions for Prof. Kaku were mainly direct questions. It seems possible that questions in the hard-science fields are rather straightforward (e.g. *What is quantum computing?*), while those in the soft science are sometimes opinion-based and rather philosophical in nature (e.g. *So, I'm saying if if your personal thoughts …*). The questioners were more careful in making commitment in their philosophical statements or questions and this results in many more indirect questions to Prof. Harari than those directed at Prof. Kaku. It is notable that these indirect questions were usually accompanied by softeners or negative politeness markers in the sentence initial position as in 'I was *just wondering* …' and epistemic modal markers as in 'This *might* be the difference between men and women …' The soft-science questioners may find it hard as well to form their questions without referring to the respondent's own claims, resulting in more leading questions such as the one below.

> *'But <u>you also sort of insist throughout the book that</u> all stories are fictions they are not true … who in the world is telling the most compelling stories right now?' [Harari p.4]*

In this statement, the interviewer did not say whether she agrees or disagrees that all stories are fictions. Instead, she merely used the statement to anchor her question to challenge the interviewee by saying if that is the case, who is then the most compelling story-teller.

In line with the questioning techniques used by the interviewer, responses from the interviewee show the same pattern. As many as 14 responses given by Prof. Harari were indirect (8 occurrences of not knowing, 6 occurrences of evasion) while most of those given by Prof. Kaku were direct (33 occurrences).

As history involves different sets of historical facts and philosophy concerns ideologies, some questions from these two fields may not be easily dealt with directly. This is different from answers to questions in pure science which are evidential and can be supported by scientific formulas and well-established scientific theories. It is not surprising therefore to see more indirect responses and evasive strategies by Prof. Harari than by Prof. Kaku.

Instead of reviewing the results comprehensively as already shown in Table 1, let us put a spotlight on the non-standard strategies as these are less typical and thus less familiar to

those outside academia. The non-standard questions include rhetorical, echo and freestanding questions, while the non-standard responses include indirect and evasive responses. These non-canonical phenomena are worth further discussion.

Self-Questioning

By comparing between the talks in two different disciplines, we can hardly say whether self-questioning styles are in fact the effect of talk in different disciplines or simply individual preferences or perhaps a combination of both. What we learn however is options of strategies in dealing with questions, especially when interviewees encounter questions that are difficult to respond to. When met with difficult questions, Prof. Harari made good use of the echoing technique to give himself more time to think carefully about the question or issue being raised. This is shown in the following dialogues.

Echo questions

Interviewer:	**What's the most recent book you read that you loved that you'd recommend**?
Uval Harari:	**What's the most recent book I've read that I loved?** I just read a very interesting book about the opium war between Britain and China in the early 19th century. I think it's not considered new anymore.

This strategy was used seven times throughout Prof. Harari's responses. Through this way of self-questioning, the interviewee has more time to think about the answer without remaining silent. Silence is to be avoided in casual conversation (Flowerdew 2013) and pondering questions is even more acceptable in academic talk than in small talk given the expected quality of information in academic contents of the talk.

Interviewer:	Before we go to the audience, maybe a cheesy question, but one I've been thinking about.
Uval Harari:	Cheesy questions are good …
Interviewer:	Given your skepticism, **who are your heroes?**
Uval Harari:	**Ooh, who are my heroes?** Mm. You mean like historical heroes or personal heroes?
Interviewer:	It's up to you.
Uval Harari:	Well, Gorbachev is, as I mentioned before. I would say at least from the historical leaders of the last century or two, I most admire him because I think I owe him my life and most of humanity in a way owes him their lives and I really admire his ability to give up power, which is so difficult for humans to do.

Prof. Harari could have mentioned anyone as his hero, but the answer needs to be relevant to what they were talking about, considering Grice's (1975) maxim of relation. The conversation would become hilarious or surprising if he chose some Marvel cartoon character to be his hero. That is why he was careful in asking the subsequent question *"You mean like historical heroes or personal heroes?"*. His answer 'Gorbachev', the former president of the Soviet Union, was truly relevant as the two interlocutors earlier talked about global politics and global powers. Note that echo questioning techniques were used as many as 7 times by Harari only. It is understandable to see this happening as speakers in soft science disciplines may seek for clarification to make sure they understand the question precisely, while in hard science the questions can be rather straightforward.

Unlike Prof. Harari, Prof. Kaku did not rely on echoing at all. Instead, he opted for the freestanding questioning technique, that is by posing questions strategically. There were as many as 24 freestanding questions in Prof. Kaku's talk. This technique was observed when he wanted to hold on to his long turn or dominate the talk. Though freestanding questions

perform a range of functions such as initiating repair sequences, inviting the interviewer's support, or requesting some information (Gialabouki & Pavlidou 2019: 19), it was found in this study that Prof. Kaku used the strategy mainly to hold on to his turn as can be seen in the following example.

Freestanding Questions

> Michio Kaku: And then the question is, is that a solution of Einstein's equations? And the answer is, yes. What's the catch? There's always a catch someplace. And that is, we don't know how stable the wormhole is. That requires us to go beyond Einstein. Einstein's equations give us rotating black holes, where there's a gateway to a parallel universe. That's Einstein's theory. And then the question is, if you go through the wormhole, can you go backwards in time? And the answer is, yes. These things are potentially time machines as well.

In the above long turn contributed by Prof. Kaku, we see that questions were used as self-initiation. Instead of waiting for questions from the interviewer, the interviewee himself initiates many sequential self-questioning and self-responding rounds. The answer to the first question is connected to the second question being raised, and the answer to the second question leads to the third question, and so forth. This strategy allows the speaker to shape his own questions and answers instead of being shaped by the interviewer. At the same time, it allows the speaker to continue his or her long turn to the point where the whole idea is completely conveyed to the point where it is persuasive. This is merely a strategy in maintaining long talk, and they are not adjacency pairs as all the questions are raised and answered by the speaker himself, not by two interactants in casual conversation (Flowerdew 2013: 121). None of these were found in Prof. Harari's talk at all.

Rhetorical Questions

Rhetorical questions, which are similar to freestanding questions in the sense that they occur within the speaker's own turn, were found to be used by the two professors. Prof. Kaku used slightly more rhetorical questions (6 occurrences) than Prof. Harari (4 occurrences). In fact, this is the only self-questioning technique found to be used by both of them.

> Uval Harari: … So what do you do 20 years from now if the Chinese are developing killer robots? Do you just say and do you just say ok we are sticking with our band and we don't we don't mind being left behind? And even if you sign some global agreement on banning killer robots, it's a dead letter. It's very easy to just sign a piece of paper. But how do you make sure that different nations actually live up to their commitments?

Several rhetorical questions were raised in the above excerpt. Note that Prof. Harari did not pause between his questions for the answers. Instead, he went on with this talk without answering any of these questions to raise awareness of the audience. This is different from the freestanding questions, shown earlier and frequently used by Prof. Kaku, as the intention is to call for attention. Rhetorical questions are also used by Prof. Kaku and one example is shown below.

> Michio Kaku: And rockets are going to be reusable in the future. When we commute to work, and you drive your car to work and park the car, do you junk your car and sell it for scrap after one trip? That's what we do for rocket ships. We take one trip in a rocket ship and dump it in the ocean.

The answer to the above rhetorical questions raised by both professors got no response either by the speakers themselves or the show hosts. The speakers were successful in raising awareness to make the listeners think deeply about the issue.

Answering Without Answering

It is possible that the respondent steers clear of the central point of the question instead of attending to it directly. This way of content shifting is referred to as an evasive rhetorical strategy (Gabrielsen et al. 2017). It is mostly found in press conferences where respondents are faced with journalists' questions that they are reluctant to give answers to in public. While it is difficult during public talks to admit that the person in charge does not have the answer to the question being raised, it is possible and accepted in academic talks for knowledgeable persons to say that there is no answer to the question. This is because some information can be said to be philosophical, ideological and opinion-oriented, or that human beings have so far reached the limit of our present-day scientific knowledge. Figure 3 below shows the frequency and variety of responses in proportion to questions.

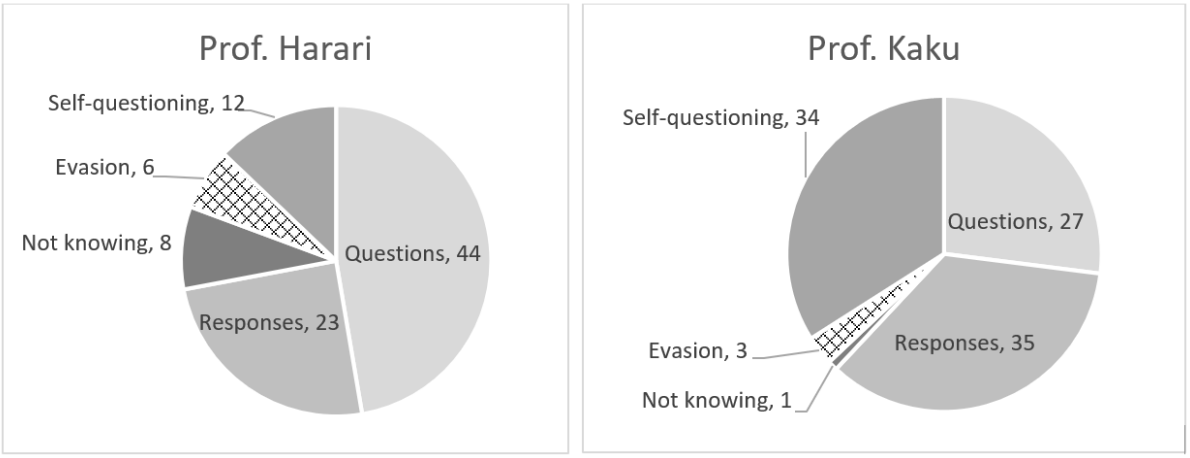

Figure 3 Proportion of responses given by the two professors

As shown in Figure 3, 27 questions from Prof. Kaku were followed by 35 direct responses and 4 indirect responses. In addition, self-questioning strategies were found as many as 34 times as discussed earlier. While only 4 indirect responses from Prof. Kaku were found, 14 responses from Prof. Harari were identified as answering without answering (6 evasive responses and 8 occurrences of admission to no answer). The evasive rhetorical strategies exploited by the two professors were classified and some examples are presented here.

Shift of Time

Interviewer:	If my future life has no meaning no work and you know very small chance of happiness, why should I bring children into that world? …
Uval Harari:	**There are many reasons why but we can spend the entire evening just talking about that.** Basically, it never occurred to me I mean if people didn't tell me that there is such a thing in the world as having children I would never have thought about it myself.

As shown in the above excerpt, Prof. Harari implies that there is not enough time for a full answer to the question being raised and he had difficulty giving the answer as can be seen in the subsequent line of his answer. In so doing, he showed respect to the questioner by

implying that the question was good and deserved serious attention beyond the show time and at the same time avoiding giving details for the question that can hardly be answered. This evasive strategy was also used by Prof. Kaku as shown in the following examples.

Interviewer:	And so I was going to ask you, what do you feel like is at the heart of your work? If your body of work were a solar system, say, what would be the sun at its center?
Michio Kaku:	Well, when I write books, I write for myself as a child. Because when I was a child going to the library, I would look up things like the fourth dimension, like anti-matter, like parallel universes. And there was nothing, absolutely nothing in the library for a young kid who wants to know about all these fantastic things they see in the movies. So I said to myself, when I grow up, and I become a professor of theoretical physics, and I work at the unified field theory, I want to write for myself, as a child. And then when I was in high school, I decided to put this into motion. So I went to my mom one day, and I said, *"Mom, can I have permission to build an atom smasher in the garage?"*

The interviewer simply asked the professor about his main area of research presumably at the time of the talk. She even made her question clearer by self-repairing (Flowerdew 2013: 131) and through using analogies of a solar system and the sun in centralizing the Prof's research area of interest. Instead of saying that there is not enough time like what Prof. Harari did, Prof. Kaku opted for shifting of time by talking about a childhood memory which inspired him towards the academic career that he has today. This strategy allows him to go back in time in narrating the whole story of his childhood as shown by the past forms of verbs and direct speech quote. This is referred to by Gabrielson et al. (2017) as a 'shift of time'. As it seems, the professor already has his own story to tell, and the ability to tell stories is truly one of the most important strategies in talk show discourse (Thornborrow 2007); it proved effective in this study as an evasive strategy. This is because using the narrative style allows the speaker to turn academic talk into a non-academic everyday story making it more accessible to the public audience.

Shift of Agent

A further example of Prof. Harari not attempting to give a direct answer is when he was asked to give a specific name. In the excerpt, he initially raised echo questions to seek for clarification before going on to explain about the notion of story-telling. In the end, he still did not mention any person or group to answer the interviewer.

Interviewer:	… **Who in the world is telling the most compelling stories right now?**
Uval Harari:	Oh, good question. **Who is telling the most compelling stories? Compelling in the sense of making people …?**
Interviewer:	Convincing people.
Uval Harari:	**Convincing people?** A compelling story and a good story is totally different things.
Interviewer:	Okay, okay.
Uval Harari:	What we see now is a resurgence of a lot of nostalgic fantasies, …
Interviewer:	**Make America great again.**
Uval Harari:	… of nationalism and of religion. As the stories that were dominant in the 20th century are collapsing or are in danger of collapsing, then nostalgia becomes very, very tempting and in this sense, it's very compelling especially in an age of accelerating change.

In the above dialogue, the interviewer made an attempt to elicit the name of a person or group who Prof. Harari would think of as telling the most compelling stories in the present day. In return, Prof. Harari gave several echo questions for some hints from the interviewer who later implied that Donald Trump might be considered one of them by her reference to his

popular expression during his presidential election campaign *"Make America great again!"*. So, in the end, it was the interviewer who had to give an answer to her own question. Prof. Harari avoided a direct answer by not giving any names and resorted to mentioning instead the kind of story popularly created by political figures, the story that involves nostalgic fantasies. By doing so, he shifted his focus away from a person, and therefore suggested that it is the idea that matters, not the person. This is similar to what Gabrielsen et al (2017: 9) have found and referred to as a shift from an agent.

Shift of Level

Interviewer:	… So, when someone asks you, like, well, how close are we actually to living on Mars, how do you answer that?
Michio Kaku:	Well, first of all, we're going to the moon next year. After a 50-year gap, the SLS booster rocket is going to be fired up and we're going to go to the moon. And not only that, there's going to be a traffic jam around the moon, because Elon Musk has his Falcon Heavy rocket capable of going not just to the moon, but Mars. He has sent a Tesla sports car on a trajectory to Mars. And then we also have the richest man in the world, Jeff Bezos — or the former richest man in the world — he has the Neil Armstrong rocket. And then the Chinese have the Long March rocket. We're going to have a traffic jam around the moon pretty soon. And I think our grandkids — our grandkids may have the option of honeymooning on the moon. The moon is — the moon is only three days away. It's a hop, skip, and a jump.

The above question raised by the interviewer concerns the likelihood of humans living on Mars, but instead of elaborating on Mars, Prof. Kaku talks mainly about the journey to the moon. He mentioned the moon eight times compared to only twice for Mars. By doing so, the professor seemed to imply that going to the moon is an easier step before a journey to Mars. If travelling to the moon is already possible by our present-day technologies, going to Mars is just a step further and therefore is possible in the near future. This is referred to as a 'shift of level' (Gabrielsen et al. 2017); that is, by mentioning something concrete or that is already happening in referring to something abstract or that has not yet been accomplished.

Conclusions and Pedagogical Implications

Several techniques in generating questions and responding to them have been found to be used by professional public communicators in pop-sci talk shows. These techniques are important as they help lubricate the flow of conversation. The objective of this study is realized as the techniques revealed may be used for classroom talk show preparation. English language learners should be more aware that talk shows are not just about asking for or exchanging information between interlocutors. Rather, they represent the art of extracting information, convincing others by making sense of what is said, while at the same time avoiding direct confrontation or other undesirable situations. There are times when hearers do not give a clear answer, perhaps unintentionally or simply because they do not know the right answer, so interviewers need to be able to dig deeper for more information strategically by using or incorporating indirect questioning strategies, as revealed in this study. Some speakers simply rely on their own freestanding questions to hold on to their turns, to dominate the conversation, not allowing their contributions to be shaped by the show host.

There is a tug of war between the questioner who always demands more detailed information and the respondent who has already prepared sets of answers and avoids full commitment to his or her own contribution, which may be shaped in an undesirable way. Balancing the different needs of the two parties is therefore not easy, but this skill is required in a successful pop-sci talk show. For example, a question may be posted upfront or in the end of a turn depending on direct or indirect strategies. An answer as well may come early,

be hidden in the middle, or in the end, or there may be none depending on responding strategies.

It is argued in this study that the talk show activity would therefore be more suitable for advanced English classes rather than for foundation classes. Students at lower levels of English proficiency are not well-equipped with the linguistic tools and techniques to be employed in talks, such as using vague language, epistemic modality for politeness, rhetorical questions, and all the pragmatic markers, which require higher linguistic and pragmatic competence.

Below are some examples of different kinds of questions and responses suggested from the findings of this study. They can be used as guidelines for academic oral discourse preparation in language pedagogy. Scaffolding activities such as observation, awareness-raising and short script preparation are suggested with guidance from the teacher.

Questions

Reflective questions:
- *So, what you're saying is …*
- *May I conclude what you've just said*?

Direct questions:
- *What is quantum computing?*
- *What can we do to prevent that?*

Indirect questions:
- *I'm wondering if you see that …*
- *That might be the case but …*

Leading question:
- *It is said in your book that …*
- *You've just talked about that …*

Freestanding questions:
- *Can you go back in time?* The answer is …
- *What is the internet?* The internet is …

Echoing questions:
- *Do I agree with this idea? You mean … ?*
- *Did you just ask me if I … ?*

Rhetorical questions:
- *How could it be that …?*
- *Who talks with the squirrels?*

Responses

Direct responses:
- *The answer is …*
- *Yes, and that's why we should …*

Not-knowing responses:
- *And I definitely don't have the answer …*
- *I think nobody has the answer …*

Evasive responses:
- *(shift of time)*
- *When I was young, …*
- *(shift of agent)*
- *I didn't mean anyone …*
- *(shift of level)*
- *Well, there are many things. Generally, …*

The strategies applied by both professors complement each other in helping us see the variety of questions and responses in different academic disciplines. This difference in using evasive strategies by the two professors is probably due to the nature of the two different fields. The talk with Prof. Harari is historical and philosophical in nature so answers are rather elusive and debatable resulting in his more indirect statements. The talk with Prof. Kaku on the other hand concerns well-established scientific knowledge and discoveries, so questions and answers are straightforward. The difference may as well arise from styles and personal preferences, referring to freestanding questions frequently exploited by Professor Kaku. It may be arguable if the style should be a norm to be taught and practiced, but raising awareness that a turn can be elaborated naturally by this technique is helpful. Again, it depends on the level of learners whether they are ready to grasp and practice using such technique in contexts. More studies on classroom application are needed.

Without much research in academic talk analysis, language teachers may be unsure how to guide their students to script a good academic talk. Students are thus often left to

figure out on their own how to perform the task, and this results in the kind of poor unnatural scripted talk shown earlier. Learners need to know that it is normal for questioners to elicit information indirectly, that multiple questions can be asked at the same time (Channon et al. 2018) and that it is natural for a respondent to repeat, challenge and evaluate the question being raised as well as to deal with the question indirectly and strategically. All of these non-standard questioning and responding strategies in fact make the academic talk natural. Without such knowledge, it is daunting for language teachers to mark or give their students comments in performing the task. What kind of remarks should be given to those students who prepare their scripts grammatically correctly, but unnaturally? What can a teacher do to adjust student scripts to make them more natural and interactive? It is hoped that findings from this study will give language teachers some insights and guidelines when it comes to preparing academic talk activities, and reflecting on student performance concerning academic talks and discussions.

Acknowledgements

This study was supported by the Department of Foreign Languages, Kasetsart University (Research Grant no. 630501RS), and approved by Kasetsart University Research Ethics Committee (COE No. COE62/079, study code KUREC-SS62/098).

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