

## **Recollecting experience in interviews: the structure and organization of engineering 'interview talk'**

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## **Abstract**

The use of interviews as a means for gathering data in hopes of gaining insight into issues of interest (e.g. conceptual understanding, relevant contexts, personal epistemologies, etc.) is widely utilized within engineering education research. Such research delve into *what* engineering experts and novices say in hopes interpreting meanings, intention, and understanding. This research paper approaches the interview from a different perspective. Instead of examining *what* is being said, this research delves into *how* interview participants speak and relay information within the context of an interview. Drawing from a specific perspective in discourse analysis (i.e. conversation analysis), this study provides analysis and interpretation regarding engineers’ recollection of experiences during ‘interview talk’ in relation to sequential and preference/“dispreference” organization. Using detailed transcripts and audio recordings of clinical, semi-structured interviews with engineering practitioners and academic instructors, the ways in which recollections of experience functioned within the structure of talk-in-interaction is examined in detail. Three patterns of sequence organization were displayed in the analyzed transcripts: adjacency pair with sequence closing thirds, adjacency pair with post-completion musings, and adjacency pairs with non-minimal post expansions. Further, the location of recollection of experiences within these patterns of sequence organization appeared to be related to whether the engineers attempted to mitigate their responses, delay giving an answer, or perform other actions that indicate preference or “dispreference” (as noted by CA researchers like Schegloff and Sacks) through the ongoing conversation with an interviewer. These findings note a common structure of talk that occurs within a commonly encountered context in engineering education research. By providing insight into the structure of talk-in-interaction, this study provides a means for analyzing interview data from a theoretical and methodological perspective emerging within engineering education research. Further, the findings from this study provide awareness of another level of interpretation regarding interview data beyond *what* is being said into understanding *how* interaction occurs between two individuals participating in clinical, semi-structured interviews.

## **Introduction**

The purpose of this study is to explore *how* interview participants recall personal experiences in their talk during exchanges with an interviewer. Transcripts and audio files of one-on-one, semi-structured interviews transportation engineering experts (working professionals and academic instructors) provide data for this study. Of particular interest in this study is the ways in which experts bring about stories of experience in their talk. Using conversation analysis (CA) as both a methodology and underlying theoretical framework, we examined the ways in which interview participants integrated and brought about recollection of experience within the structure and order of their talk-in-interaction. The focus on experience and its relation to organization of talk emerged from initial readings of the data. After reading through several interview transcripts and listening to detailed audio recordings, two themes began to emerge from the data: 1) there existed some structure and order in the exchange between interviewer and interviewee, and 2) interviewees recalled personal experience to mediate their answers. This study initiates the

analysis of this relationship by providing a guide for future research mediated by conversation analysis as a methodology.

## Literature Review

Gee describes discourse analysis (DA) as a way of examining, describing, interpreting, and analyzing the way in which people go about being, doing, and saying<sup>1</sup>. It is a means of interpreting activity situated within some context through talk and action<sup>2</sup>. DA continues to emerge within engineering education research as a qualitative research method with potential to provide deeper insight into issues of interest to the field<sup>3-5</sup>. Thus far, DA has been utilized to explore what it means to be an engineer in terms of identity<sup>6</sup>, it has been used to characterize interactions within groups<sup>7-8</sup>, and it has provided insight into transference of knowledge amongst a group of people<sup>9</sup>, among other findings in engineering education research. This study hopes to add to this growing body of literature by examining *how* people talk to one another during a setting commonly associated with educational research.

DA stems from a variety of theoretical foundations, many of which have differing underlying assumptions regarding the interpretation and analysis of talk<sup>10</sup>. The theoretical perspective taken in this study is conversation analysis, or CA. CA concerns itself with the order of talk-in-interaction<sup>11</sup>. The underlying assumption within CA is that when people are conversing, they are actively engaging in ways to order their talk<sup>12</sup>. Individuals construct their conversation upon some structure in order to achieve some goal<sup>13</sup>. Research using this perspective in DA seeks to identify predictable, orderly practices in conversations<sup>14, 13</sup>. This is achieved through the provision of empirical work exemplified by detailed analysis of order and micro-features of talk<sup>15</sup>. Micro-features include portions of talk not normally addressed in other forms of DA. Features such as breath pattern, length of pauses, relative volume of speakers, drawn-out speech patterns, and other such features are symbolized within the transcriptions of talk in research using CA as methodology. In order to maintain consistency with the field, we re-transcribed the interview transcripts utilized in this study to include Jeffersonian notation symbols. Existing research of the function of micro-features of talk include characterizing overlap of talk during conversations<sup>16</sup>, the systematic use of laughter in conversation<sup>17</sup>, the function of specific sayings (e.g. “oh”) in cueing conversation partners of changes in ongoing thought processes<sup>18</sup>, among other studies of interest. These studies reveal order in the seemingly chaotic nature of interaction.

The power of CA as a research methodology is it inherently checks assumptions we have about seemingly mundane tasks. Through detailed accounts of these mundane actions, we expose ourselves to patterns of human action previously ignored or not accounted for in the attempt to explain issues and problems in the world. A seminal work using CA was Sacks’s characterization of conversational strategies utilized by callers to a Suicide Prevention Center in avoiding giving their name to the call-taker<sup>19</sup>. Sacks noted that conversational features, rather than explicit denials to provide a name, are what prevented the call-taker from getting a name and provided the caller the opportunity to avoid giving information they did not want to give<sup>19</sup>.

Talk-in-interaction displays several organizational features, including adjacency pair type<sup>13</sup>. Adjacency pairs, such as question-answer pairs, include specific features that characterize the

talk-in-interaction as such<sup>13-20</sup>. For example, a minimal adjacency pair for question-answer pair includes a first part speaker (typically the interviewer) asking a question and a second part speaker (the interviewee) responding to the question.

Related to the sequence organization of talk is the organization of preference. Preference organization is the alignment between the first pair part and the second pair part<sup>21, 13</sup>. According to Schegloff, preferred responses are typically direct, short, and to the point<sup>13</sup>. Levinson further noted that a preferred response is one in which a first speaker attains an expected answer from the second speaker<sup>21</sup>. Dispreferred responses are characterized by acts of mitigation, attenuation, and elaboration within an individual's talk<sup>13</sup>. Levinson further noted that a dispreferred response is one in which a first speaker attains an unexpected or non-answer from the second speaker<sup>21</sup>. Other indications for dispreferred responses is the presence of delays in talk, such as pauses prior to answering, or mitigating statements that attempt to defer answering the question in a direct manner<sup>13</sup>.

As noted previously, CA asserts that conversation has some sequential organization that conversing partners actively pursue throughout their talk. This active engagement by the conversing individuals provides opportunity to also dynamically attempt to achieve some personally-held goal. Take the example conversation listed below:

Maria: .hh hey' 'ya mike (.) You gonna finish that?  
Mike: I haven't eat-n yet

This short exchange between Maria and Mike provides an example of a delivery of a dispreferred response according to the CA framework. Maria's portion of the conversation is the first pair part. Mike's response is the second pair part. The exchange between the two is considered an adjacency pair. A preferred response would align Mike's response to Maria's initiation of the conversation. In other words, a preferred response from Mike would have looked like this example conversation:

Maria: .hh hey' 'ya mike (.) You gonna finish that?  
Mike: nah (.) you:: want some?

The second exchange characterizes a preferred response because Mike immediately gave an answer to Maria's question ("nah") and the conversation continued to progress with Mike asking Maria for her input. Compared to this, the initial example does not fulfill the same line of actions. Instead of quickly and concisely addressing Maria's immediate question ("You gonna finish that?") with either yes or no answer, Mike attempts to mitigate his response by avoiding a direct answer to the question ("I haven't eat-n yet").

These types of observations and interpretations exemplify the perspective and researchable qualities of CA as a research methodology. Following this tradition of work, this study will attempt to determine the relationship between interviewee's recollection of experience to the sequence and preference organization of their talk-in-interaction.

## Methods

Using CA as both a theoretical and methodological foundation, we completed a micro-analysis of talk-in-interaction of a group of experts within the field of engineering. Identifying data sources, participant selection, collecting data, and designing the analysis of the data are discussed in this section.

### Data Source

The data analyzed for this study was obtained after the completion of a project exploring differences in understanding of and processing of knowledge regarding specific engineering concepts amongst two types of experts (practitioners and instructors) within the field of transportation engineering<sup>22</sup>. The results of this prior study illustrated that both types of experts tended to embed their knowledge within personal experiences<sup>22</sup>. Taking this into account, the role of experience in talk within the context of the interview was explored in order to better understand the complex, situated relationships that occur during interviews. This study provides a check on the assumption that talk of personal experience emerged in talk in response to interviewee's knowledge.

The original researchers designed the interview questions based on past research addressing clinical approaches to interviewing<sup>23-27</sup>. Thus, talk within the interview followed a routine turn-by-turn format<sup>28</sup>. This is not to say that the interviews were rigid. The interviewer, for the large part, restricted her responses to assure that the focus and source of the story came from the interviewee.

The original researcher conducted 48 one-on-one interviews with practitioners and instructors. Originally, over 400 pages of transcriptions were included in the data package. However, the original transcripts did not have detailed micro-features of talk required to do CA. Thus, only those data sets with audible recordings were included in this study. In total, 36 interviews were included in this study. For these interviews, sections of the transcripts utilized for analysis were re-transcribed to include Jeffersonian notation symbols<sup>13</sup>.

### Participants

Our study included 25 practitioners and 11 instructors, providing a diverse sample of experts within the field of transportation engineering. The range of years in practice for the individuals in the practitioner group was between 5 and 33 years of practice. Further, the educational experiences of individuals within the practitioner group appeared diverse: all but three practitioners had engineering degrees, and five practitioners noted earning master's degrees in engineering and other fields. The instructor group included individuals at varied levels of tenure: the range spanned from graduate research and teaching assistants to full professors. Further, the instructor group had individuals whose years of experience in the field range from none to 26 years. In terms of teaching experience, the instructor group's years of experience ranged from one to 33 years.

### Data Collection, Reduction, and Analysis

Due to this study's exploratory nature, we presented a microanalysis of specific sections of the original interviews. During the original interviews, one of the questions asked, "Is sight

distance/ stopping sight distance more or less important in horizontal curves than vertical curves?” This question provides a unique opportunity to explore preference organization because the question itself forces the interviewee to make a decision amongst four answers in order to generate a preferred response. Figure 1 notes these preferred responses. Answers provided by the interviewees beyond these responses were considered dispreferred. Note that preference does not equate to correctness. Exploring where experience emerges within such responses provided an interesting backcloth for this study.

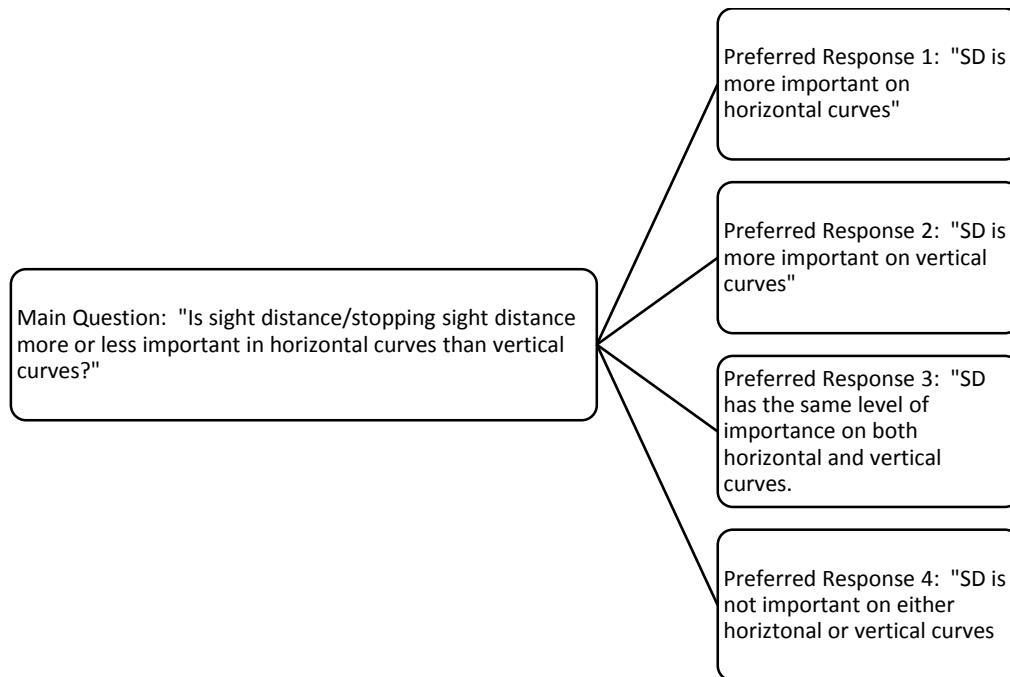


Figure 1: Preferred Responses to Main Question

The process of analysis was guided by past work<sup>29</sup>. This process was iterative in nature in order to address emergent themes from the data set. Reading, re-reading, identifying patterns and themes, and reflexive documentation exemplified this process. We conducted three iterations of this process in order to ensure validity and reliability of our interpretations of the data set. The first pass of this process was to identify structural organization of the talk-in-interactions presented in the text and audio recordings. Sequential organization components identified in CA literature (such as expansion, first and second pair parts, and adjacency pair types) were noted at this stage of the analysis and data reduction. Preference organization was also determined at this point. The second pass of the data included identifying patterns associated with micro-features of talk. The third pass of the data analysis included identifying recollections of experiences within the interview transcript and audio data.

## Results

The transcripts analyzed in this study displayed relatively complex forms of sequences in talk. Schegloff noted the addition of pre-expansions, insert expansions, and post-expansions to minimal adjacency pairs in talk-in-interaction<sup>13</sup>. In other words, talk between individuals may be

expanded upon with the addition of talk beyond minimal interactions. Schematic A represents an example schematic with the noted expansions.

### Schematic A

Speaker A	→ Pre-expansion	→ Fpre	→ preannounces intention (pre-telling)
Speaker B	→ Pre-expansion	→ Spre	→ responds to Speaker A's preannouncement
Speaker A	→ First Pair Part	→ Fb	→ asks main question
Speaker B	→ Insert expansion	→ Sins	→ initiates other-repair by asking to rephrase the question
Speaker A	→ Insert expansion	→ Fins	→ rephrases question
Speaker B	→ Second Pair Part	→ Sb	→ answers question
Speaker A	→ Post-expansion	→ Fpost	→ asks a follow-up question
Speaker B	→ Post-expansion	→ Spost	→ answers follow-up question

There were generally seven different iterations of this schematic found within the excerpts analyzed for this study. The most common forms of talk are noted in Table 1. Notably, talk inclusive with post-expansions were most commonly found within the excerpts analyzed for this study.

Number of Excerpts that included parts of talk (Schegloff, 2007)	F pre	S pre	F b	S b	SCT	PCM	F post	S post
15			x	x	x			
6			x	x	x	x		
1	x		x	x	x	x		
1	x	x	x	x				
1	x	x		x			x	x
3	x		x	x			x	x
9			x	x			x	x

Table 1: Iterations of Schematic A found within excerpts

In order to better illustrate these sequential organizations of talk, we provide excerpts from representative interviews. The first is an excerpt that exemplifies the use of a sequence closing third (SCT). This excerpt is from Practitioner 08's interview:

### Sequence: Fb, Sb, SCT (Practitioner 08)

INT:	Fb →	Um: (.) Do you find that sight distance is more or less important in horizontal (.) curves versus vertical curves? (2.1)
P08:		<b>Um I find it more often coming into play (.)</b>
	Sb →	with vertical 'cause horizontally (.) <b>you can generally just see (.) you know, if there's an obstruction in the way, you can see it,</b> [so=
INT:		[mm-hm
P08:		=h I think where people miss a lot of it is vertically, yeah. (0.6)
INT:	SCT →	okay.

In this excerpt, the regular line of questioning occurs between the interviewer and interviewee. Note the bolded statements in Practitioner 08's excerpt. These are statements of experience. The first bolded statement is more personalized with the use of personal pronouns. The second appears to be an assertion based on experience. In this example, the experience occurs in the second pair part. Further, the level of ownership of the statement appears to shift between the first and second statements of experience.

Also notable about this excerpt is that it lies atop a borderline between a traditionally-defined preferred response and dispreferred response. Note the 2.1-second delay between the interviewer's line of questioning and the response from the practitioner. This inter-turn delay typically manifests in dispreferred responses<sup>13</sup> in natural talk, which typically excludes interview situations. However, due to the relatively direct answer provided by Practitioner 08, we consider this as a preferred response in this study.

In terms of a relationship between statements of experience within Practitioner 08's responses and the order of talk, note the bolded statements' locations relative to the portion of talk exemplifying a preferred response, which is called out with a symbol "Sb→." Statements of experience surround the preferred response. This occurred in many of the transcripts analyzed for this study.

The second interview excerpt exemplifies the use of a post-completion musing (PCM). This excerpt is from Practitioner 17's interview:

Sequence: F pre, Fb, Sb, SCT, PCM (Practitioner 17)

INT: Okay. (1.1) UM: (1.5)  
 F pre → this (.) kind of goes with wha-what (.) you were just talking about.  
 F b → Do you find that it's more or less important (.) in horizontal curves than vertical curves? (0.8)  
 Sight distance?  
 (0.3)  
 P17: U::m: (1.0) °boy° (0.9)  
**Just based on (.) what I do for I-90.**  
 Sb → It usually just (.) plays:: (.) a- an effect in the vertical.  
**I can see ROADS-**  
**We do have ro:ads where .hhh (0.4) a-wo- going up Mount Spokane**  
**I CAN see highways** where the horizontal would probably play into it: (.) as much or not- or  
more,  
**.hh (0.5) but that's not u- what I've done.**  
 INT: SCT → mm-hm. (0.3)  
 [Okay.  
 P17: PCM → [So (0.6)  
**FOR WHAT I do,** it's usually the vertical.  
 (0.3)  
 INT: Okay.

In this excerpt, Practitioner 17 provide several statements of experience. The roles and identities shift throughout the response as evidenced by shifts in usage of pronouns. The first talk of experience regards Practitioner 17's identity as an engineer working on I-90. The next portion of talk of experience shifts to a role that may or may not be associated with an engineering identity.



The next use of experience in Practitioner 17's talk is inclusive of some community as evidenced by the use of "we." Lastly, the role shifts back to Practitioner 17's own engineering identity.

In terms of preference organization for this excerpt, the division between preferred and dispreferred is difficult to discern. Again, the use of filler words and pauses at the beginning of a response typically indicates a dispreferred response because it illustrates that the second pair part speaker is delaying the conversation. However, like Practitioner 08, Practitioner 17 does provide a direct answer relatively quickly. In addition, Practitioner 17 repeats the response even after the interviewer attempts to close the conversation. Again, we categorized this response as preferred. Note, also, the location of the portion of talk that typically exemplifies a preferred response relative to statements of experience. Again, statements of experience surround the preferred response.

The last type of post-expansion was non-minimal post expansions. This excerpt is from Practitioner 20's interview.

Sequence: Fpre, Spre, Sb, F post, S post (Practitioner 20)

INT: Um (4.9)

Fpre → Did I already ask you i:f (.) um: (.) you feel that sight distance is more or less important in a horizontal curve versus a vertical curve?  
(1.2)

P20: Um (0.3)

Spre → no, I don't think we covered that one.

INT: You don't? Okay.  
(0.4)

P20: Um (1.3)

Sb → It's important (.) in both aspects  
.hhhhh uh or in-in both (.) challenges, [both situations.=  
[mm-hm

INT: [mm-hm

P20: =.hhhh There isn't (.) as much: (0.4) that we can do about a vertical: (0.6) u:m (1.8)  
prof- uh: profile .hhh uh (0.3) obstruction (0.6) when the roadway itself (0.5) is the obstruction.  
.hhhh uh  
**There are some locations that we have out THERE, and it's (0.6) even (.) difficult to s:ign .hh  
to warn the motorist about (.) a profile [obstruction.=**

INT: [mm-hm

P20: =.hhh um (1.1)  
We CAN PUT UP other signs that (1.3) would (0.3) make them aware (0.4)  
a:::nd .hhh u:::m (2.8)  
get their attention that there is something [going on=  
[mm-hm

INT: [mm-hm

P20: =But as far as communicating that idea quickly to a motorist it's- it's very difficult.  
.hhhh Uh for curves ahead, for horizontal curves, **it's- it's pretty e:asy to (.) give them a  
warning sign,**  
**.hh and we'll have (0.5) um (1.4)**  
**depending on what the speed limit is, there are(0.3) there are two styles of signs .hh one that  
has a (0.3) c:urve, a gentle (0.9) a forty-five degree bend (.) and an arrow on it. (0.3)**  
**The other that has a sharper ninety degree (0.3) curve. .hhh and those are (0.6) put out  
there based o:n: .hhh whether or not the curve can be comfortably driven (0.4) within (0.3)  
ten: or fifteen miles an hour of .hhhh the posted speed limit.**

[.hhh um  
 INT: Fpost→ [ Do you mean below (.) or above?  
 P20: Spost→ Below.  
 INT: Okay.

In this excerpt, Practitioner 20 does not provide explicit statements of personal experience. However, statements within the excerpt implies some sort of experience. The first bolded section, Practitioner 20 asserts that there exists locations of concern. In the next bolded statement, Practitioner 20 states, “it’s – it’s pretty e:asy”, indicating some experience associated with the statement. In terms of preference organization, this excerpt deviates from choosing one situation of the other in favor of choosing both. However, like the previous two excerpts Practitioner 20 provides a concise answer after a short inter-turn gap. Again, we classified this as a preferred response.

In order to provide a representative example of different types of preference organizations, an excerpt of Instructor 06’s interview is provided below:

Sequence: Fpre, Fb, Fpost, Spost (Instructor 06)

INT: Okay.  
 Fpre → .hhhhh Would you say that (.) oh and- (.) this has a little bit more to do with highway design than intersection [design=  
 I06: [mm-hm hh  
 INT: = but um (0.4)  
 Fb → .hh do you find that sight distance is more (.) or less important on a horizontal curve (0.2) vers- (0.4) um (.) a vertical curve? hhhh (1.0)  
 I06: ((lips smacking)) .hh  
 ah it depends on the: (0.4) environment, right. In a ur- in an urban environment (0.4) with buildings that are (.) up to that (block face) [then=  
 INT: [mm-hm  
 (0.4)  
 I06: = I would (.) say that’s the ca:se:. (0.6)  
 INT: Fpost→ That (.) they’re about equal (.) in importance? Or that- (0.4)  
 are you saying [that the horizontal’s=  
 I06: [.hhhhhhhhhhhh hhhh  
 INT: = not more important than the vertical? (0.2)  
 I06: U::M:  
 Spost→ (.) I think the: hhhh I think it j- yeah, it just depends. [U:m hhh  
 INT: [°mm-hm°  
 I06: Sb→? =oftentimes it’s the:: horizontal that’s (.) more important because: (.) the vertical isn’t an issue.

In this excerpt, Instructor 06 fails to provide any direct answers to the question posed by the interviewer until the very end of this section of talk. Despite the interviewer’s attempt to reiterate the question, Instructor 06 responds with hedges. Instructor 06 provided mitigating statements and elaborated within assertions, and as a result, almost mitigated the preferred statement to a vanishing point. This action exemplifies a dispreferred response. Also notable with this excerpt is the lack of statements of experience.

## Discussion

Notably, statements of experience from interviewees in this study were typically located within second pair parts and Speaker B's post-expansions. Upon further examination, we found that the excerpts analyzed fell into three categories in relation to post-expansion types: sequence-closing thirds (SCT), post-completion musings (PCM), and non-minimal post expansions. Table 2 displays further details on these types of post-expansions.

<b>Post-expansion Type</b>	<b>Explanation of Post-expansion Type</b>	<b>Typical location of talk of experience</b>	<b>Number of excerpts exhibiting post-expansion type</b>
<b>Sequence-closing thirds</b>	Interviewer attempts to 'close' conversation by stating, "okay" or its variants forms after receiving an answer from the interviewee. Interviewee does not pursue expansion on conversation	Second pair part	15 total
<b>Post-completion musings</b>	Interviewee provides further musings on the subject of discussion after the interviewer attempted to 'close' a conversation.	- Second speakers' post-expansion only - Both second pair part and post-expansion*	7 total
<b>Non-minimal post-expansions</b>	Interviewer attempts to expand talk with probing questions, other-initiated repairs, topicalization, challenges, and re-workings.	- Second pair part only - Second speakers' post-expansion only - Both second speakers' pair part and post-expansion	13 total

Table 2: Post-expansions Displayed in Talk

However, the function of experience in talk displaying post-expansions differed between conversations reflecting preferred and dispreferred responses. For example, in talk displaying non-minimal post expansions with dispreferred responses, talk of experience functioned as a means of delaying providing a direct answer to the interviewer's main question. In talk displaying non-minimal post expansions with preferred responses, the function of the experience was to support the interviewee's initial answer to the main question.

## Conclusions

This study provides an introduction into how CA may be utilized to explore interview data. By providing some structure and order into the interactions that occur within these settings, greater detail about how people are interacting, how people are reacting, and how they order their talk within conversation may be ascertained from the data. A particular interest for future research is further analyzing the interrelationships between structure of talk and underlying function of themes of talk (i.e. experience). As noted in Practitioner 20's interview, there exists an

ambiguous relationship between what an individual actually experienced in the tangible world and what the individual imagines could happen based on some prior knowledge, and each of these provide differing functions in justifying, claiming, and representing their knowledge.

An interesting implication from this study and option for future research is exploring the different degrees of experience displayed within the analyzed discourse. The varying identities assumed by the interviewee and its relationship to the experiences that they brought forth in the interview may give greater insight into why people bring up personal experiences in their attempt to explain their knowledge about engineering concepts.

This exploratory study provides an initial step in integrating research methodologies that have yet to completely emerge within engineering education research. Expansion on both results and use of methodology may benefit the field. This methodology provides a way to delve into the structure of our interactions with one another. This provides a powerful analytic tool for future research.

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