Primer on Dan Hillman's Thesis

Jeffrey Young

May 21, 2017

Executive Summary

Is Hillman's data suitable for our us:

Yes. I believe we will be able to make use of his data, but we will not be able to say anything in regards to Substantive Meaning using this data.

Is Hillman's typology more expressive or less expressive than Bellack's, should we us Hillman's or Bellack's:

We should use Hillman's Typology, in many ways it is a large improvement over Bellack's and his agreement rate is $> 90\%$. We will need to modify his typology as he collapses the Substantive meaning category so that it *does not* need to be described *for every* topic.

What did Hillman learn from his data:

TBD, I ran out of time and didn't get to this.

Other considerations

You may want to look over the "Reference that will be useful" section as this paper is well sources, and is a good branching point for other papers to check out. I've highlighted some interesting ones.

Source Document

The source document, for this primer is located here: `http://www.quahog.org/thesis/new.html`

Context

This document is for the XOP Encoding project, participants include Eric Walkingshaw and Jeffrey Young. This is the third such primer in the project, the first one is a primer on DN-Theory, the second a primer on typologies of explanation, specifically Bellack et al's typology. This document expands on bellack et al's typology by summarizing the thesis of Dan Hillman. Dan Hillman iterated on bellack's typology, changing and improving it in several ways, and hence his typology is of interest to the XOP project. Dan Hillman was also kind enough to provide the data he compiled with his typology for the XOP Project.

Orientation

This document is meant to explicate three things:

1. What are Hillman's changes to Bellack's typology and why

2. What is the nature of the data that Hillman compiled and it is useful to the XOP project?

3. What did Hillman learn from his data, what were the conclusions of his thesis?

The document assumes you are familiar with Bellack et al's typology, and the XOP Projects goals, progress, and current issues. If any of those is not the case then please refer to prior documents to orientate yourself before reading on.

Details on Hillman's Data

General Details of the Data

- n = ~51,000
- Data is composed of Face-To-Face (FTF) and Computer-Mediated-Communication (CMC)
- All data is from courses taught at New York School of Education between 1994 - 1995
- Data was recorded from 2 classes:
    1. Systems Analysis and Design
    2. Database Management and Systems
- Both courses had FTF and CMC versions, and both versions taught the same material

Details on the Transcription of the Data

- FTF courses were recorded on audio cassette, transcribed to word docs, then munged into a database
- Participants for CMC courses communicated, and were recorded, by Lotus Notes.
- only interactions that encompassed *the whole class* was included
- interactions during breaks were not considered or included
- Any small group discussions that took place were not considered or included
- No one working on the transcript, editing, or the coding, had knowledge of what was transcribed, which participant said it, or the purpose of the research

Database and data information details

Database Contains

- All text
- Participants sex
- Participants role (Teacher/Student)
- Number of words in each sentence
- Metadata of course (Course name, date etc.)

Data alterations

- All audio recordings were pre-pended with a character to denote the speaker, one of:
    1. t $\triangleq$ teacher
    2. m $\triangleq$ male student
    3. f $\triangleq$ female student

Hillman's Problems with Bellack et al's typology

Most of this is taken directly from Hillman's thesis:

1. Problem: Bellack's system fails to differentiate between a one-word response and a one-liner response. This is consequent of Bellack et al's decision to round any non-line utterance to length 1.

   Effect: This gives unfair weight to utterances that are less than one-line length, which distorts the differences between teacher and student utterances (with the latter being inflated).

2. Problem: Structuring and Soliciting moves fail to capture monologues or exegesis

   Effect: This constrains the systems unit of analysis, in fact, Hillman found that studies which employed Bellack's system, and Bellack et al's own data, have almost no monologues by the teacher, and are almost never have adult student participants - only children.

3. Problem: The difference between Responding and Reacting moves is often minimal and the two are easily interchangable, especially in asynchronous communication (Bellack et al assumed synchronous communication e.g. a conversation)

   Effect: Superfluous encodings and noise in agreement rate

4. Problem: Substantive meanings fail to account for progressive levels of meaning, which, in turn, make it difficult to code for any subject in which the same idea or procedures are used at higher levels. For example, in a math class one would learn multiplication or division not as an end in and of itself, but as part of a larger process. Bellack's system cannot account for this in a clean way.

5. Problem: Substantive Meanings are not abstracted from the course material at all. In general, each substantive meaning is derived from the course material, but if that material differs slightly than the meanings must also change.

   Effect: Comparing courses on the same material or topic becomes more difficult

6. Problem: Instructional Meanings are similarly limited

7. Problem: Inclusion of an Audio-Video devices inflates its importance in the classroom interaction to that of the participant.

   Effect: One cannot claim that if a teacher plays a move or audio snippet as part of the lesson that the student is interacting with the content in *an observable* manner.

8. Problem: Bellack et al's system does not distinguish between differences in students.

   Effect: One cannot analyze the variable of sex in the data.

9. Problem: Bellack et al's system distinguishes between discussion that occurs "as the result of an assignment", and intra-classroom discourse.

   Effect: This excludes discourse which occurs from a teacher assigning work *and then* building on that assignment in class.

Hillman's modifications to Bellack's Typology

Hillman's Typology consists of three Tiers with the first being Purpose:

Purpose

Pedagogical Moves are denoted by Purpose. Purpose has 7 Categories. Hillman describes Purpose as a highway. In order to use a highway, one must get directions to it, know the length of the journey, and the destination; these would correspond to orienting utterances. When on the Highway, one moves forward by the Lecturing purpose. A rest stop, to relax, recover, get gas or food would be a Humanizing purpose. And finally an off-ramp would be an Eliciting move, while an on-ramp would be a responding move. The exact definitions of each are as follows:

1. Organizing: Similar to Structuring moves, organizing sentences do not elicit a response and are not responses. Organizing sentences set an agenda, organize a discussion or recitation, and function as a means to get to other Purposes. Hillman describes them as functioning similar to an on-ramp to a highway.

   Ex. "In a minute I'll be handing you an overview of the course as well as handouts for the first session." [Organising/Fact-Stating/Procedure]

2. Eliciting: Similar to Soliciting moves. Eliciting moves consist of solicitations or explicit directives. They include all questions, commands, imperatives, and requisitions. They are specifically designed to cause interaction.

   Ex. "Send me a Response to Response if you have any questions concerning the basic forms creation process." [Eliciting/Performing/Procedure]

3. Responding: Responding moves combine reacting and responding moves from Bellack's typology. They form a reciprocal relationship to any previously uttered move. In CMC courses, one may respond to a single word of the electronic lecture, or to the whole lecture, thus a responding move can "close" any previously uttered move, or moves. A responding move concludes when sentences cease to serve the function of directly responding to the previous moves.

   Ex. "Yeah I hear, I hear." [Responding/Rating/Person]

4. Lecturing: Lecturing consists of talk about the course content that is neither explaining a change in topic (Organising), soliciting a response (Eliciting), nor Responding. Lecturing is differentiated from Responding in that Responding is directly applicable to an Eliciting purpose. When the Responding move has moved away from the purpose of merely answering the Eliciting, it is then Lecturing. For example, suppose a student asked a teacher what colour fire engines were. The immediate answer, "red" (or "fluorescent yellow-green") would be a Responding sentence, but anything beyond that, such as explaining why so many fire engines are red, would be Lecturing.

   Ex. "We went a little over tonight, but that's all right." [Lecturing/Fact-Stating/Content]

5. Humanizing: Humanizing moves create an atmosphere conducive to interaction by means of making student feel welcome jokes or small talk. Humanizing moves' purpose is to make some feel at ease or maintain the relationship. These moves are free from pedagogic content. This type also includes the use of emoticons. Hillman speaks more to this latter use, it is not represented here.

   Ex. "You don't prefer to be called Jill?" [Humanising/Fact-Stating/Person]

6. Idling: This category has no analogy to Bellack's typology, rather this is a pure addition. Idling sentences are sentences which are intelligible but serve no pedagogical function, and unlike Humanizing sentences have no defined goal e.g. to create a comforting environment. This type of move is included because it is a way for the teacher to pause and collect their thoughts.

   Ex. "That you, you know when you, oh no, no, no." [Idling/Filler/Not Clear]

7. Not Clear: The bottom value for the Purpose tier. This is encoded when words are unintelligible.

Mechanism

Mechanisms are similar to Instructional-Logical Meanings (Hillman uses Instructional-Logical meanings, but I think he means Substantive-Logical), they describe *how* the subject of the sentence is being discussed. There are 9 sub-categories:

1. Fact-Stating: This is identical to Bellack et al.'s definition of Fact-Stating

2. Explaining: This is a combination of Bellack et al.'s definitions of Interpreting, and Explaining. This is used for sentences in which clarification, definition, or rationale is explicitly given.

   Ex. "It's a tool, and just like other tools (say automobiles, guns, and chain saws), people can use it constructively and destructively, wisely and wastefully." [Responding/Explaining/Content]

3. Opining: This is identical to Bellack et al.'s definition of Opining.

4. Performing: The Mechanism of Performing is similar to Bellack et al.'s instructional-logical meanings of Performing and Directing, in which one requests or expects an action to occur. Quite simply, Performing is the process of telling someone to do something.

   Ex. "When you are finished with the student biography, pass them towards the center, please." [Eliciting/Performing/Action]

5. Repeating: Hillman's own words are required for this one: The definition of Repeating is similar to that of Bellack et al. in which one (in their case, presumably the teacher) repeats or rephrases what is said (presumably by a student) as a way to indicate "an implicit admitting" that the offered response was correct. An illustration from the FTF transcripts:

   Teacher: Now remember, the output of analysis is the input to– [Eliciting/Performing/Content] Student: To design. [Responding/Fact-Stating/Content]

   Teacher: To design. What else do you need to know? [Responding/Repeating/Content, Eliciting/Fact-Stating/Content]

   My coding system, however, has broadened this definition to also include repetition used for the purposes of setting context, which is not necessarily an indication of agreement. In this example, the use of repeating isn't merely to show one agrees (in the sense that the student is correct), but it is also used for getting attention – as a point of focus – to provide context for actions to follow. In this case, the context is "You say 'design.' I acknowledge your answer, and use it as a point of focus or context for my next move." This is also used in asynchronous communications, such as USENET newsgroups or courses delivered via CMC, in which text is quoted so that other participants will understand what the respondent is talking about.

6. Rating: A combination of Bellack's Rating, and Acknowledgment. This serves to appraise or acknowledge a participant's move.

   Ex. "He's right." [Responding/Rating/Person]

7. Rhetorical Device: an Eliciting move that is *not intended* to solicit a response. This can be a graphic or some other prop used in the classroom. A rhetorical device may be used in a series of Lecturing or Fact-Stating moves for such a purpose. A rhetorical question would be an eliciting purpose in conjunction with a rhetorical device mechanism.

   Ex. See Hillman's thesis for a detailed example.

8. Filler: Analogous with the Idling Purpose, but for mechanisms.

9. Not Clear: The bottom value.

Subject

This tier describes *what* is being discussed in the sentence, the content being considered or statements *about* something.

1. Person: The subject of a sentence is literally a person.

   Ex. "I was pleased to have the opportunity to get to know you a bit through my role as Client in the Systems Analysis course Case Study." [Lecturing/Opining/Person]

2. Action: a person or object does something, this definition includes Bellack et al.'s definition of Action.

   Ex. "Those of you who do not have books, look on." [Eliciting/Performing/Action]

3. Procedure: A subset of Action, in which one is told *how* to do something, rather than just *to do* something.

   Ex. "If you've already made a new replica of the User's Guide, please do not replicate it further until the above mentioned posting." [Eliciting/Performing/Procedure]

4. Content: This code is used for sentences related to course content. This is Bellack's Substantive Meaning category, except that instead of defining it in terms of the specific content of the subject, it is defined as being *on-topic*. If a sentence refers to the *subject* of the course, then it is *on-topic*, and is Content.

   Ex. "With relational, you basically retrieve multiple records at a single time and the system decides how to access based on your call." [Lecturing/Explaining/Content]

5. Supplies: The subject of the sentence deals with course material, teaching aids, and devices, be they books, forms, projectors, computers etc..

   Ex. "This tape is about three years old." [Lecturing/Fact-Stating/Supplies]

6. Not Clear: The bottom value for the Supply tier.

Handling Combined moves

If a sentence encompasses more than one subject, it is coded as the highest appropriate level. Thus, to use Bellack et al.'s example, a teacher directing students to engage in some classroom procedure which required the use of supplies would be coded as Procedure-Supplies. The rationale is that to have the course, one must have students (Person). These students may be directed (Action) to engage in some classroom Procedure (Procedure) which required the use of Supplies (Supplies).

References that will be of use and why

1. Paper: Weber, R. P. (1985). Basic content analysis. Beverly Hills: Sage Publications.

   Why: This paper defines and describes general steps to classify a text into categories of content.

2. Paper: Atkinson, P. (1981). Inspecting classroom talk. In C. Adelman (Ed.), Uttering, muttering: Collecting, using and reporting talk for social and educational research, (pp. 98-113). London: Grant McIntyre Ltd.

   Why: This paper explains that, the ability to respond, and participate in interactions, in synchronous communication, is made possible by the *typing* of utterances that immediately precede that one.

3. Paper: Sacks, H., Schegloff, E., & Jefferson, G. (1974). A simplest systematics for the organisation of turn-taking for conversation. Language, 50, 696-735.

   Why: This paper expands on Atkinson's paper by describing interactions as an adjacency pair.

Other thoughts

- Bellack's system is synchronous i.e. based on discourse and inter-locution. Computer based learning artifacts are asynchronous i.e. one sided exegeses. The DSL we are trying to make is... synchronous? or asynchronous, I'm pretty sure we discussed this as synchronous.