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Formulating the Triangle of Doom: Le Geste dans son Contexte

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Abstract

For any concept or category presented gesturally, there is a range of possibilities from which a particular formulation may be adopted on any actual occasion of use. We will examine here how Schegloff's analysis of locational formulations might be extended to analyze gestural formulations. We have been studying the practices through which surgeons provide instruction while performing surgeries in a teaching hospital. Surgeons rely upon surgical atlases and texts as guides in traversing the particularities of the interior spaces of their patient's bodies. Knowing how to map abstract structure to that which is available to sight and touch in an unfolding surgery represents a form of "professional vision" (Goodwin, 1994). We are interested in the practices through which professional vision is developed, including the role that gesture might play within these practices. Here we will examine a particular anatomy lesson taking place during a surgery performed in a teaching hospital. The attending surgeon uses his hands and arms to gesturally construct a description of a particular anatomic region ("the Triangle of Doom") for the benefit of two medical students viewing and participating in the surgery. Employing the structure of Schegloff's analysis of lexical place formulations, we conduct an analysis of the Attending's gestural formulation. We suggest that categorial analysis of the type done here might represent a promising direction for future gesture research.

Keywords: *gesture, category analysis, ethnomethodology*

Schegloff's (1972) "Notes on a Conversational Practice" was written to "direct attention to the sorts of considerations that enter into the selection of a particular formulation" (p. 81), which he defined as follows:

[I]f one looks to the places in conversation where an object (including persons) or activity is identified (or as I shall call it, "formulated") then one can notice that there is a set of alternative formulations for each such object or activity, all formulations being, in some sense, correct (e.g. each allowing under some circumstance "retrieval" of the same referent). (p. 80)

Schegloff initiated his study of formulations focusing on a particular kind of formulation—formulations of place. These he described in terms of the "considerations which are part of the work a speaker does in using a particular locational formulation, and the work a hearer does in analyzing its use" (p. 81). He wrote:

For any location to which reference is made, there is a set of terms each of which, by a correspondence test, is a correct way to refer to it. On any actual occasion of use, however, not any member of the set is 'right.' (p. 81)¹

He described how such formulations provide for an analysis of the conversationalists' locations, their identities as members of particular categories in society, and their orientation to "the topic being built up or talked to [and] the activities being enacted in the utterance" (p. 96).

In his analysis, Schegloff examined individual utterances and focused on how location formulations are accomplished lexically. Locational formulations, however, can and do have gestural components. Like location descriptions, for any concept or category presented gesturally, there is a range of possibilities from which a particular formulation may be adopted on any actual occasion of use. Our interest is in how these different formulations work as meaning-constitutive structures and how they might index elements of the material environment. We will examine here how Schegloff's analysis might be extended to analyze gestural formulations of place.

The data to be presented here come from a corpus of materials gathered as a part of the Deixis Project. The name comes from the Greek *δεικνυσ*, meaning to show directly. The project is specifically concerned with how the organization of teaching and learning is directly revealed through the practices of its production. We have been studying such practices in a particular applied setting, the operating room of a teaching hospital.

Becoming a competent surgeon involves not only mastery of a professional vocabulary, but, more crucially, a mastery of the embodied practices required to locate and constitute the objects referenced by that vocabulary in an environment that is both complex and consequential. To a surgeon, the interior of each patient's body is a space with its own distinct and relevant particulars. Knowing how to map abstract structure to that which is available to sight and touch in an unfolding surgery represents a form of "professional vision" (Goodwin, 1994). Surgeons rely upon surgical atlases and texts as guides in negotiating the interior spaces of the patient's body. We are interested in how practitioners, novice and skilled, use their bodies through gesture and other forms of embodied action to make these mappings explicit. Our analysis will focus on an anatomy lesson conducted during a surgery. It represents a single-case analysis of how a particular gesture was formulated.

¹ As Schegloff took pains to explain later in his chapter, there is an important distinction to be made between "correct" formulations and "right" formulations. He clarified:

"Right" formulations need not be drawn from the set of "correct" formulations; it is not a set-subset relationship. When one office worker says to another at the end of a coffee break, "Well, back to the salt mines," the rightness of the formulation is not precluded by the "incorrectness" of the term as a description of his work place. This is direct parallel for place formulations to what Sacks calls "intentional mis-identification" for membership identification. (p. 432fn)

2.

Data

1.1. Preliminaries

The case which provided the context for the lesson was a laparoscopic, bilateral inguinal hernia repair. Rather than make a large abdominal incision, laparoscopic surgeries are performed using a fiber-optic camera and other special tools inserted through small incisions. Participants, in the case under study, consisted of an attending surgeon (A), a resident (R), a scrub nurse (N), and two clerkship students (CF and CM). As our analysis begins, the surgery is being conducted by the resident under the close supervision of the Attending. They are positioned around the table as shown in Figure 1. All orient toward a video monitor placed at the foot of the table, which displays the view captured by the endoscopic camera inserted in the patient's body. As we enter the scene, R is performing a dissection using a pair of grasping tools inserted into the patient's inflated abdomen, CM is operating the camera, and A is engaged in a didactic dialog with CF.²

A frequently encountered topic in surgical talk, particularly in teaching settings, focuses on post-surgical complications, both their nature and how they might be avoided. Such complications may be general (e.g., wound infections, complications owing to the use of anesthetic, etc.) or procedure-specific. In the surgical correction of hernial defects, care must be taken to avoid injury to the vessels and nerves present, but not always visible, in the region in which they are working. The lesson began, therefore, with a question to CF, “((CF's given name)) what nerves are at risk with ((R's given name)) repair here?” The exchange followed a pattern familiar to those who have studied discourse in the classroom – teacher asks a “known information question” (Heap, 1979), the student responds (or fails to respond), the teacher assesses the student's response (or doesn't, c.f., Koschmann, Glenn, & Conlee, 2000), or offers a clue, or pursues a new line of questioning. Employing this recognizable structure, the attending and CF collaboratively produced the names of two nerves that run in a

² A transcript of the fragment can be found in Appendix B. The transcription conventions are described in Appendix A.

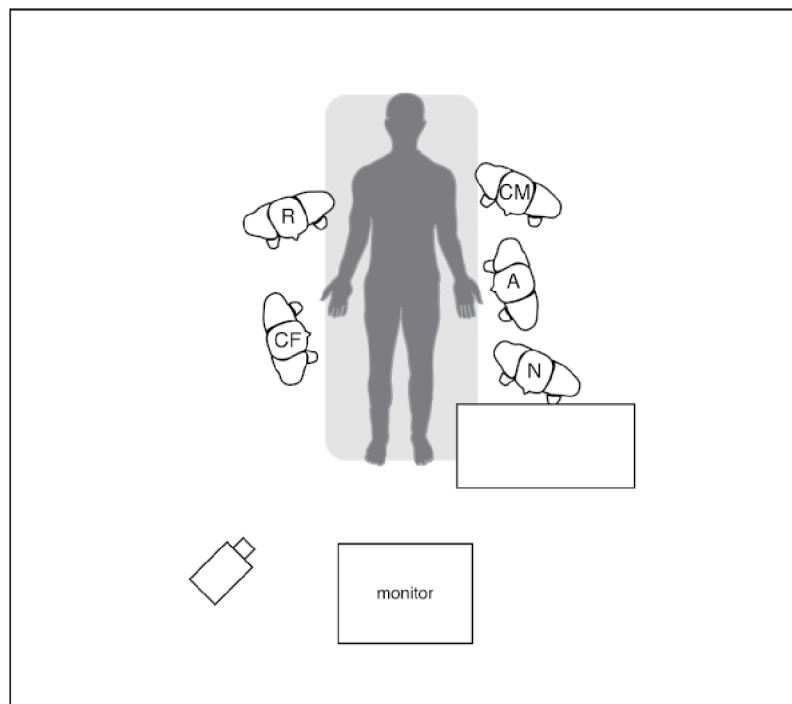


Figure 1. Layout of the surgical workspace showing the positioning of the participants.

region the attending surgeon refers to as the “Square of Doom.” He reported (line 56), “If you place staples in that region [you’re] really at risk of putting a staple through one or both of those nerves creating just horrendous post-operative paresthesias and anesthetics and pain.” He allowed that there is some controversy within the surgical community concerning whether to define the cautionary region as a triangle or as a square, the square being a more conservative approach. The resident inserted that he preferred to define it as a triangle and the Attending countered that within the surgery they were performing, no staples would be placed within the “Square of Doom.”

1.2. Formulating the Triangle of Doom Gesturally

The disputed region had yet to be delineated for the purposes of the discussion, however. The Attending proceeded to do so, therefore, in an exchange transcribed as follows:

(Excerpt 1, #02-008)

85 A: [The triangle is the uh
86 R: first staple
87 (1.3)
88 A: The triangle is the spermatic vessels (0.4) and the
89 va:s (0.4) creating a triangle like this
90 CF: Mm mhm
91 A: And what we do is we keep that lateral one but go
all the way up to iliopubic tra:ct (0.8) and
make it a square instead of a triangle
94 CF: O[kay
95 A: [So everything below iliopubic tract
96 R: (blunt grasp)
97 A: and between the vas and the vessels (.)
98 [n::o] staples go in that region
99 CF: [Mm mhm]

Prior to beginning line 85, the Attending has had his arms crossed on his chest. As he began his turn at talk, he raised both forearms before him. His forearms were angled slightly away from his body and his flattened hands project toward a point of convergence. CF shifted her gaze from the monitor to the Attending.

The gesture of particular interest to us was produced in conjunction with Attending’s utterance in lines 88 and 89.

88 A: The triangle is the spermatic vessels (0.4) and the
89 va:s (0.4) creating a triangle like this

As shown in Figure 2a, he began this turn at talk with his arms already forming an angle. He made a small chopping motion with his right hand, as he articulated “spermatic vessels.” As he expressed “the va:s,” he repeated this gesture with his left hand and brought together the tips of his fingers (see Fig. 2b). His gesture, therefore, began with a triangle structure already established, and through his hand movements he arranged to associate his right arm with the spermatic vessels and his left with the vas. He completed the construction on “like this” and marked its completion by raising his two arms together to the level of his chin (see Fig. 2c).

As he continued his presentation, Attending twitched both hands slightly as he uttered “keep that lateral one” in line 91. He then lifted his elbow so that his left forearm was oriented parallel to the floor. As he articulated “all the way up to iliopubic tract,” he raised his left arm to the level of his eyes. Then, he lowered his left arm to the level of his right hand as he produced line 95. Finally, he swung the left hand out (stopping on “the vas”) and

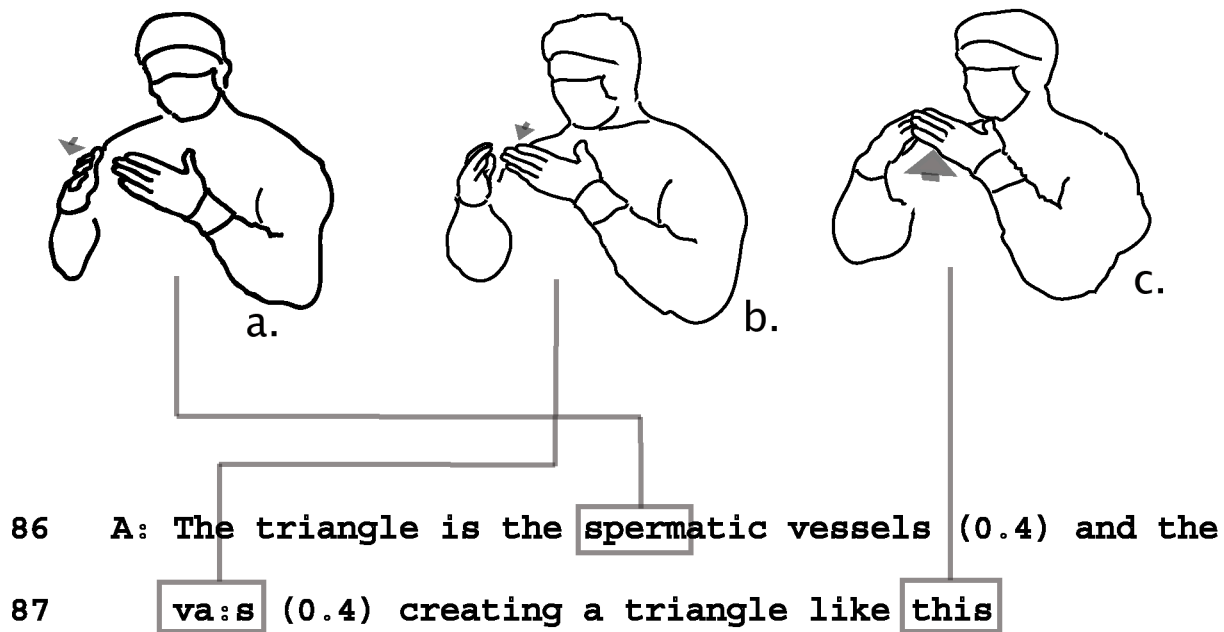


Figure 2: The coordination of talk and gesture in formulating the Triangle of Doom.

repeated the small chopping motion with his right hand as he enunciated “the vessels.” He retired both hands as he asserted “no staples go in that region” (line 98). CF nodded and returned her gaze to the monitor.

1.3. Completing the Lesson

Shortly after the production of this gesture, the discussion returned to the topic of the region to be avoided. The following exchange occurred:

(Excerpt 2, #02-008)

125 A: [Show ‘em your triangle there ((R’s
 126 given name))
 127 R: This is (0.3) right here
 128 A: Kay
 129 (0.9)

The resident, at this moment, was operating two grasping tools in the space viewable on the monitor. These served as prosthetic pointers for ostension within the laparoscopic view. With “This is (0.3) right here” (line 127), he made three strokes with the tip of tool held in his right hand along a line that might approximate one edge of the triangle defined by the location of the spermatic vessels.³ After a few moments, the Attending prompts him further:

(Excerpt 3, #02-008)

136 A: And the vas?

³ See Goodwin’s (2003) discussion of “tracing” in situated pointing.

137 R: °so:::°
138 (3.0)
139 A: 's: gonna be somewhere in there
140 (2.0)
141 R: The vas should be going right in here

Heritage and Sorjonen (1994) have described how “and-prefacing” can serve as a device for linking related utterances. Here, the Attending’s and-prefaced query is tied in its form back to the resident’s recently completed demonstration. The lesson is then brought to a close with the following exchange:

(Excerpt 4, #02-008)

142 A: Nkay () so that’s the two vessels
143 CM: N’kay
144 A: The (two) structures like this

As the Attending delivered these two utterances he reproduced the triangle gesture (two hands brought before his chest) and turned his gaze to CM, who nodded. The gesture works as a local convention for referencing the Triangle of Doom. In line 144 Attending self-repaired “two vessels” as “(two) structures.” The referent of “structures,” however, was potentially ambiguous, since there are numerous recently mentioned candidates (e.g., the vas, the femoral vessels, the rectus sheath, Cooper’s ligament). It was the accompanying gesture that provided the cohesive link (McNeill & Levy, 1993) back to the prior talk and that made evident that the intended structures were the vas and the spermatic vessels. Interestingly, the spermatic vessels were never explicitly identified by the resident though he marked their approximate location with his three strokes of the surgical tool. The ostensive demonstration is only completed retrospectively, therefore, through the Attending’s summative statement (line 144) and its affiliated gesture.

2. Analyzing a Gestural Formulation

For the purpose of the discussion that follows, we will focus our attention on Attending’s gesture produced in association with lines 88-89 and depicted in Figure 4. Our interest is in examining how this gesture in its production exhibits attention to what Schegloff referred to as the “this-one-here-and-now-for-us-at-this-point-in-it” within the context of use. Schegloff divided his analysis of place formulations into three components: *location analysis*, *membership analysis*, and *topic/activity analysis* which take up respectively the “where-we-know-we-are” (p. 115), the “who-we-know-we-are” (p. 115), and the “what-we-are-doing-at-this-point-in-the-conversation” (p. 115). Of these, membership analysis or analysis of “who-we-know-we-are” is probably most salient to understanding the organization of the lesson described earlier, but we will take up the three forms of analysis in the order in which they were presented in Schegloff (1972).

Schegloff described how the “selection of a location formulation requires of a speaker (and will exhibit for a hearer) an analysis of his own location and the location of his co-conversationalist(s), and of the objects whose location is being formulated” (p. 83). In the setting within which the Attending produced the gesture, the speaker and listener are facing each other from opposite sides of the table, the patient is positioned on the table between them, and the region referenced as the “Triangle of Doom” is situated within the body of the patient. It is not available to direct inspection. Instead its visibility is mediated by the endoscopic surgical equipment (i.e., fiber-optic camera, video monitor). In this way, the region has a dual status, as a space viewable on the video monitor and as a projected, but not directly viewable place within the body before them.

How would one reference such a region? One simple practice for ostensive demonstration described by Goodwin (2003) is to perform a “trace” using elements of the visible scene as a semiotic backdrop. Effective

delineation of a fine structure within a complex visual scene, however, requires that the trace be performed in close proximity to the object or surface being employed to render it sensible.⁴ Repositioning himself to perform such a trace in this situation would have been difficult for the attending surgeon for various practical reasons.⁵ By performing the referential work in another way, Attending displayed an orientation to the physical objects in his environment and the position of his own body and that of his listener.

Another feature of Attending's gesture relevant to a location analysis can be seen in the way in which it was mapped visually to the scene portrayed on the video screen. The Triangle of Doom is a bilateral structure – regions so signified can be found on both sides of the patient's abdominal floor. The right and left regions are not only identical, but are mirror images of each other. The view captured by the camera at the moment that the Attending produced his gesture revealed a left-side triangle. For a left-side triangle, the vas deferens which is always positioned medially to the spermatic vessels, would be seen entering the internal ring from the right side. By associating his right arm with the spermatic vessels (see Fig. 2) and his left with the vas, a representation is produced from the listener's perspective (but not the speaker's) of the proper orientation of the two relevant structures as they can be found in the scene displayed on the monitor. In this way, the Attending displays an orientation to how his gesture would be viewed by someone observing its performance from the other side of the table.

The second component of a formulation analysis proposed by Schegloff was what he termed a *membership analysis*. By this he meant an analysis of “the categories of members of the society of which the hearer(s), in the first instance, but also the speaker, are members; that is, there are relationships between the identifications made (by the parties) of the parties of the conversation, on the one hand . . . , and the selection and hearing of [the] locational formulation, on the other” (p. 88).

Talk in the operating room at a teaching hospital is dual-purposed; it works both to advance the unfolding surgical procedure, but it also has an important instructional component. We will address the first aspect later in the analysis of topic/activity. The second is highly relevant to the analysis of CF, CM, and the resident who were all engaged in training at different levels, and this has crucial implications for how the talk is organized. It also has implications for how Attending's triangle gesture was formulated. The gesture reveals evidence of careful recipient design work and reflects an orientation to what his interlocutor (CF) might reasonably be expected to know. His formulation, both in its lexical and gestural development, is tailored to be sensible for a surgical clerk. What would count as “right” for a surgical clerk might be seen as inappropriate for an advanced resident, however. By even producing a gesture at all, Attending was constituting CF as a person for whom a gestural illustration of the region might be necessary. The gesture, in its design, therefore, reflects Attending's ongoing assessment of the recipient's relevant experience, and her knowledge and understanding of the surgery and the relevant anatomical structures. In this way, Attending's membership analysis informs the referential work and the organization of the interaction.

In other settings⁶ we have seen how participants engaged in discussions of body parts might use their own bodies or the bodies of others as props for demonstrating the matter under discussion. Another obvious alternative formulation for the Triangle of Doom, therefore, would be to produce a gesture employing the patient's body and, in this way, representing the scale and location of the region in question. One downside of such a formulation, however, is that it would leave as an exercise for the listener the task of translating the defined region from the physical space of the patient's body to the virtual space of the video monitor. Beyond this, however, the Attending's triangle gesture revealed an orientation to the kind of work they were doing and,

⁴ See, for example, Norman's demonstration of the hypothalamic region in Exhibit 1 in Koschmann and LeBaron (2002).

⁵ Direct access to the monitor was cut off, both by the tool table and the scrub nurses body. Further, the Attending was tethered to his spot by a microphone cable.

⁶ Examples, in Koschmann and LeBaron (2002), might include Maria's demonstration of the location of the hypothalamus in Exhibit 1 or Susan's demonstration of a thrill in Exhibit 3.

by extension, the kind of workers they were as constituting themselves as by participating in this work. Open surgeries involve dissecting layers (“tissue planes”) from the outside-in. Laparoscopic hernia repairs, on the other hand, begin from the inside and work out. By organizing the gesture with regard to what is visible on the monitor instead of the patient’s body, Attending displays an orientation to what counts as “professional vision” in laparoscopic surgeries, orienting, in this way, to laparoscopic surgeons as a membership category.⁷

Schegloff’s third and final approach to the study of place formulations had to do with how participants display through a formulation an orientation to “what-we-are-doing-at-this-point-in-it.” By way of a topic/activity analysis of Attending’s triangle gesture and the utterance that accompanied it, the question might be asked, why this and why here? Specifically, how is the timing of this gesture related to the unfolding sequence of the surgical procedure? One might observe prosaically that the demonstration is timed to correspond to the appearance of the region in question on the video display. The Attending’s triangle gesture was designed to render the scene on the monitor sensible, but it should be observed that the sensibility of this scene also depended crucially on its sequential development.⁸ In this way, the gesture builds its sense on the displayed scene, but the scene itself was an achievement of the advancing procedure. The gesture, therefore, can be said to have been *informed by* the procedure. At the same time, however, the anatomy lesson can also be said to *inform* the procedure. In its placement before the actual application of staples, it not only provided a contextualized tutorial on surgical anatomy for the benefit of the two students, but also a practical warning for the resident. By asking the resident to demonstrate the region for the medical students, Attending made concrete the area in which no staples would be allowed regardless of any further debate about Squares and Triangles of Doom. In this way, the gesture, in its timing, displays an orientation to its place in an unfolding and consequential procedure.

3. Discussion

Within the lesson described here, the participants could be observed working together to constitute a complex structure employing the resources at hand. The analysis revealed how a relatively simple gesture can be precisely formulated to both exploit the semiotic affordances of the material environment and to address the communicative needs of the moment. We demonstrated how gestures performed in the service of sense making are ordered at a detailed level.

Schegloff never suggested that his analysis of location, membership, and topic/activity represented an exhaustive treatment. Rather, his three-part approach was offered as a preliminary framework for analyzing one kind of formulation work selected from a larger set of investigatable conversational practices. We believe we have demonstrated that a similar approach could be profitably applied to the task of better understanding a particular, occasioned gesture. No representations are made, however, that all gestures can be analyzed in precisely this way and further work will be required to determine just what kinds of gestures lend themselves to this sort of treatment.

Analyzing gestures as formulations has a number of benefits. First, instead of engaging in conjectures about intending meanings, this approach explores how the performance of a gesture serves to advance the conversation and ongoing work. In this way, it links the gesture performance to the members’ ongoing work of developing topic, location, and membership. Further, it demonstrates how any given gesture is just one member of a set of possibly “correct” gestures.

⁷ A related example of how profession attention is developed as an aspect of membership is the practice of training airline pilots to rely on their instruments by having them fly “under the hood.”

⁸ We have seen evidence of this in post-surgical interviews. Even highly-experienced surgeons sometimes have difficulty orienting themselves in a still frame. To understand what they are seeing, they must reconstruct the procedure that produced the occurring scene.

Its “rightness” is an analyzable and situation-bound property. Such an analysis directs attention to the ways in which interaction is both shaped by, and shapes, context. As Schegloff stipulated, “to say that *interaction* is context-sensitive is to say that *interactants* are context-sensitive, and for what and how that is so is an empirical matter that can be researched in detail” (p. 115). Through the use of place formulations, participants “particularize their contributions so as to exhibit attention to the ‘this-one-here-and-now-for-us-at-this-point-in-it’ character of the interaction” (p. 115). He argued that such formulations particularize “at least for location, composition (at least with respect to those membership categories relevant to the selection of place formulation) and place in conversation (topic, activity)” (p. 116). We have carried this one step further by showing how in one setting a participant particularized a gesture in ways that displayed sensitivity to the “where-we-know-we-are,” the “who-we-know-we-are,” and the “what-we-know-we-are-doing” of the occasion. In this way, our analysis is designed to contribute to our growing appreciation of *le Geste dans son Contexte*.

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