Data Generation and Representation of Science Classroom Discourse: A Case For Video Recording Using Multiple Cameras.

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The purpose of this paper is two-fold. Firstly to report findings from a study concerned with students' meaning making in a middle school science classroom, and secondly to highlight methodological issues related to the generation and representation of data for the analysis of classroom discourse. The study was a discursive analysis of students' positioning in science classroom conversations with the aim of creating new understanding of existing issues such as declining student attitudes towards science in the middle years of schooling and problems associated with the enculturation of students into science through participation in school science. Data was generated for the study from video recordings of a year-seven science class using multiple cameras and post-lesson, video-stimulated interviews filmed by the International Centre for Classroom Research in Melbourne. A conversational episode related to a classroom activity in which students were asked to write down their opinions on the classification of slime has been selected as representative of findings from the study. This episode has been represented for the purposes of the paper in two ways: as a transcript produced from the audio tracks of one of the classroom cameras; and as a phonological transcript prepared for discourse analysis using multiple cameras and audio tracks. Comparison of the two transcripts highlights data generation and representation as important considerations in the analysis of meaning in science classroom conversations. Findings from the study highlight the complex social process of meaning making in science classrooms and the need to attend to local moral orders of rights and duties in research on student language use and learning in science.

Background

The focus of this paper is the process through which suitable data was generated from classroom videotapes for discourse analysis using an illustrative classroom episode, and an analysis of this episode using discursive psychology.

Discursive psychology originated within discourse analysis in social psychology and has become a significant body of research contesting cognitive psychology (Edwards and Potter 1992; Harré 1992b; Kroger and Wood 1998). Discourse as social practice is the object of study. The study focused on the discursive practices of students as they made meaning in context, including the way they positioned themselves and were positioned by others (Davies and Harré 1999).

The discourse analytic perspective emphasizes the need to work with recordings and records (not reports) of verbal and nonverbal aspects of discourse (Wood and

Kroger 2000). A year-seven class taught by an experienced middle school science teacher who had been recommended by his peers as a highly competent teacher of science and who agreed to participate was chosen for the study. Videotaped student discourse in and about their science classroom was the main data source used in the study. The generation of suitable data was achieved with support from the International Centre for Classroom Research at the University of Melbourne.

The results of the study have been presented as the discursive umwelten (Harré 1990) of three focus students (Tasha, Angie and Kesar), consisting of the representation and analysis of conversational episodes that were chosen as representative of the breadth of the students' science classroom discursive practices (Arnold 2010; Arnold forthcoming). A conversational episode in which students had been asked to write down their opinions on the classification of slime (the slime episode) has been selected as representative of findings from the study. This episode has been represented for the purposes of the paper in two ways: as a transcript produced from the audio tracks of one of the classroom cameras; and as a phonological transcript prepared for discourse analysis using multiple cameras and audio tracks. Comparison of the two transcripts highlights data generation and representation as important considerations in the analysis of meaning in science classroom conversations.

The analysis of the slime episode illustrates the focus students' practice of taking shared responsibility for 'personal' opinions. The students also took shared responsibility for observation during practical activities (Arnold forthcoming). In taking shared responsibility, their observations cannot be understood in terms of individual perception of an ontologically given reality, and their opinions cannot be understood in terms of individual cognitive schema, calling pedagogical initiatives grounded in cognitive psychology and perceptualism into question. It was also found that the students took the practice of writing practical reports as a personal responsibility. In taking personal responsibility, discussion and argumentation of their predictions using scientific concepts was limited (Arnold forthcoming). The findings highlight the complex social process of meaning making in science classrooms and the need to attend to local moral orders of rights and duties in research on student language use and learning in science. More attention needs to be directed to the consequences of our theories of learning and pedagogical initiatives for the public, collective practices promoted in science classrooms including the meanings made of these by our students.

Research Design

The research design was modelled upon the Learner's Perspective Study (Clarke 2006), an international study of mathematics classrooms that included the videotaping of lessons using multiple cameras and audio tracks, and separate post-lesson, video-stimulated interviews with the teacher and selected students. The generation of suitable data was achieved with support from the International Centre for Classroom Research at the University of Melbourne. An inclusive research design was developed by a team of researchers in order to satisfy the aims of this project along with two other PhD projects and an Australian Research Commission funded international project entitled 'Science Classrooms from Multiple Perspectives' (Clarke 2009).

A secondary science class in the middle years of schooling was sought for the study. A year-seven class taught by an experienced middle school science teacher who had been recommended by his peers as a highly competent teacher of science and who agreed to participate was chosen for the study. The filming was conducted in 2007 in term four; the last term of the school year, by which time students would have developed familiarity with secondary schooling practices and practices specific to their science classroom. Nine lessons comprising a complete unit of work were recorded using four video cameras and seven audio tracks. Three cameras were trained upon the teacher and each of two focus students, and one camera panned the whole class from an elevated position at the front of the room. The Teacher Camera and two Student Cameras were positioned on tripods at the side of the classroom and were capable of swivelling to capture the movement of the teacher and the focus students respectively as they moved around the room or repositioned themselves from the tables to the practical workbenches. Immediately following each lesson, the teacher and two students were interviewed in separate, concurrent interviews and were asked to play sections from the lesson video that were personally important, and to explain their choice to the researcher. The interviews were semi-structured in much the same way as an ethnographic interview (Spradley 1979). Documents were also collected, including the teacher's unit and lesson plan material and photocopies of every student's written work including practical reports, note taking and the end of unit test. The author, herself an experienced science teacher, made written observations of each lesson. The unit of work was The States of Matter, a unit that coincided with the usual curriculum at this school and which was being taught at the time of filming.

The audio tracks from classroom and interview videos were fully transcribed. For each lesson the Student Cameras and the Teacher Camera gave rise to three concurrent classroom transcripts. These transcripts were produced to satisfy the inclusive design in recognition that different researchers for different research projects would use them and included minimal analyses to the extent that any verbal action that was picked up by the cameras' audio tracks was included.

Reference Transcripts were constructed for the purpose of an initial reading of the discourse from each of the Student Camera transcripts. The constructions of the Reference Transcripts represented a stage of analysis because they included only utterances that contributed to conversations in which the focus students or teacher participated and omitted utterances that were not deemed part of the focus students' or teacher's conversations. The results of the initial reading were the identification of classroom conversational contexts and all conversational episodes in which the topic of conversation was identified as relevant to the study. Three contexts for talk in the classroom were identified: whole-class conversations, small-group student conversations and conversations between students and the teacher. These contexts were differentiated because of marked differences in the way the participants were positioned in each of the contexts. The content of interest that was identified included student talk about science; about doing science; and conversations that the students participated in whist doing science. Doing science included doing science classroom activities or experiments and participating in whole-class discussions. Conversational episodes containing relevant talk were identified in the transcripts, colour-coded and

labelled with brief summaries of the conversational content (for example, see Appendix 1).

The episodes identified in the initial reading were coded using pronominal coding (Muhlhaüsler and Harré 1990). Utterances in these episodes were analysed for their function, beginning with more detailed, phonological transcription (Appendix 3). Repeated viewing of the videos was necessary at this stage. As well as ensuring the accuracy and completeness of the transcripts, the following features of the discourse were marked: overlapping and latched speech, pauses, intonation, pronunciation, laughter, audible in and out takes of breath, the relative length of sounds and the relative speed and volume of utterances. Descriptions of non-verbal action were included in the transcripts when it was deemed necessary for the analysis of meaning. Care was taken with descriptions to avoid interpretation. Relevant action that was not picked up by the videos used for the Reference Transcripts was included where possible using the concurrent classroom videos and my notes taken during the observation of the lessons. Through the repeated viewing, consideration of what was said, the audience addressed, the responses from interlocutors, voice intonation, gestures and any tool use, utterances were analysed for their force as social acts, including positioning and evolving storylines (Harré and Langenhove 1999a).

In the next section, one of the episodes identified in the initial reading is represented as a Reference Transcript, the production of which relied upon one of the Student Cameras; and as a Phonological Transcripts. A comparison between the two transcripts has been made for the purpose of initiating discussion about the generation of suitable data for the analysis of meaning in classroom conversations.

The Slime Episode

In lesson seven, the teacher asked the students to write down their opinions as to whether slime was a solid or a liquid prior to making it. Included as Appendices 1 and 2 are the Reference and Phonological Transcripts of this episode respectively. At 0:20:32 in the Reference Transcript (Appendix 1), Angie says, "can we say it's both?" and the teacher says, "pardon no its one or the other" and it appears in the reference transcript as though the teacher is responding to Angie.

However, the Phonological Transcript of this episode (Appendix 2) was prepared using information from multiple classroom cameras. In consideration of the phonological transcript, it becomes apparent that the teacher, in saying "Huh? (.) No. It's one or the other", is actually talking to another student who was not audible to the Student Camera used to produce the Reference Transcript. Close viewing of the teacher's body language suggested that the teacher may not have been attending to what Angie had said. This was confirmed upon viewing the Teacher Camera video, where it could be ascertained that he was responding to another student.

Importantly, the analysis of the episode facilitated by the phonological transcript shows that my initial interpretation that the teacher does not accept Angie's hypothesis that slime is both a liquid and a solid was not correct. The teacher's response to Angie of "OH IF- LOOK (.) IF YOU WANT TO SAY ITS <u>BOTH</u> THAT'S O<u>KAY</u>. BUT I'D PREFER A DEF- DEFINITIVE ↓ANSWER." was in response to Angie's question, "Mr Gardiner can we say its <u>both</u>?" Rather than rejecting Angie's hypothesis, he was responding to the way in which he had been

positioned and positioned himself, as responsible for providing the 'rules' under which the students performed a classroom activity (classifying slime as either solid or liquid and providing their reasoning by drawing on information provided in previous lesson, before making slime) and Angie's question was consistent with this storyline, in particular her use of the collective first person to position herself as a member of a group (taken by the teacher as the student group, indicated by his response to her, addressed to the student group). The teacher also provided the concession, "IF YOU WANT TO SAY ITS <u>BOTH</u> THAT'S O<u>KAY</u>", as an amendment to his initial rules and he raises his voice to share this amendment with the whole class. Therefore my reading of the episode prior to phonological transcription that "the teacher did not accept Angie's hypothesis" did not capture the meaning of the teacher's social action here. Only by "slowing down the discourse" and attending to the function of the utterances was a more accurate analysis of meaning achieved.

It is important to note for the purposes of continuing discussion that this analysis would not have been possible had I been relying upon the microphones attached to the Student Video only.

Conclusions

The analysis of the slime episode revealed the students' practice of taking shared responsibility for 'personal' opinions (see Appendix 2). Within the episode, Angie's sense of personal agency was diminished as a result of this practice. This practice occurred within a storyline where the teacher was assigned and took personal responsibility for the 'rules' of the activity. The teachers' positioning and related storylines would be common in a classroom setting. However, in a dialogic exchange, the teacher 'bent' the rules to allow the students the option of saying "its both". Kesar's acts within the episode contributed significantly to the positioning of Angie as obligated to follow the rules of the activity. It was through the mutual enactment of the storyline that Angie's sense of personal agency was diminished and not through acts attributable solely to the teacher. This highlights the complex social process of meaning making in science classrooms and the need to attend to local moral orders of rights and duties in research on student language use and learning in science.

The analysis of the slime episode implies the following for research in science classrooms: 1. That the visual record of the teacher's body language contributed significantly to the analysis of meaning suggests video rather than audio recording of action is desirable. 2. That action visible or audible from one video recording was insufficient for a reliable analysis of meaning suggests video recording of science classrooms using multiple cameras is necessary.

It is our ethical duty as researchers to perform our analyses of classroom action as reliably as possible. At stake, among many other things, are the reputations of our teachers.

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Acknowledgements

Appendix 1 - Reference Transcript Featuring The Slime Episode

KEY	
   	whole class conversation/ students respond to teacher
   	private conversation SG
   	private conversation SG and Teacher
   	private conversation SG and S
   	Interesting episode(s)
SG	**Member(s) of Student Focus Group (Girls)**
S	**Student(s) not in focus group.**

context	time	speaker	transcript	notes
	0:17:48	Teacher	alright Simon shh now um now some of you are actually doing a good job with um this so far and some of you are very close to finishing now um if we don't get this finished right now you'll get some time at the end of the lesson what I want you to do is turn to the next available page in your theory book I'm going to ask you a question and before we can actually make the slime I'm looking for everyone to write a response preferably Becky not on a Sally's hands and the question is this	
	0:18:16	Angie	I've got one more	
	0:18:23	Student	yeah [laughs]	
	0:18:27	Student	ah	
	0:18:27	Student	do we write this down or	
	0:18:28	Teacher	ah I want you to write in your theory book slime liquid or solid and then I want you to answer this question now of course a lot of you have handled slime before when you were little boys and girls and	
	0:18:42	Darcy	I haven't	
	0:18:42	Teacher	well then you're gonna get a great chance today my question of you is based upon all the information I've supplied so far think about the information so far for example you've done today with um arrangement of particles the very first activity we did where we looked at shapes where we discussed whether solids liquids or gases have fixed shape volume occupy space etcetera etcetera think about all the rules that we've really looked at for solids liquids and gases in a second Susie I want you to explain why you think slime in your opinion is a solid or a liquid now I'm going to give you five minutes to write down the answer and once you've done it show me 'cause nobody's gonna do the activity until you've had an attempt	teacher asks for students' opinions but does not accept Angie's hypothesis that its both
	0:19:24	Angie	I think its both	Expresses personal opinion
	0:19:30	Teacher	you no you write what's there you give me an answer is slime a liquid or solid why	
	0:19:34	Student	so it it doesn't matter if its wrong (...)	
	0:19:36	Teacher	it can be wrong I don't care do you think its a solid or a liquid and why	
	0:19:38	Kesar	yeah ah can we say its both	
	0:19:40	Heath	yes Angie about that um that (...) up into the air and then catches in on his back (...) hell no (...) [laughs] he's got that serious look he's like (...) hop on	
	0:19:45	Angie	I think so	
	0:20:03	Angie	[laughs]	
	0:20:15	Heath	you've got to laugh (...)	
	0:20:17	Angie	that's funny	

	0:20:27	Angie	can we say (...) oh ok	
	0:20:27	Teacher	well we'll discuss that in a minute [to class] solid or liquid give your reason why	
	0:20:32	Angie	can we say its both	
	0:20:32	Teacher	pardon no its one or the other	
	0:20:35	Angie	oh	
	0:20:35	Abigail	Mr Gardiner can we say its both	
	0:20:37	Teacher	oh look if you want to say both thats ok but I'd prefer a definitive answer	
	0:20:43	Angie	are you going to do one or are you going to do	
	0:20:53	Angie	I think	
	0:20:55	Kesar	I dont know which one maybe its got free particles (...)	
	0:21:00	Angie	I think its a solid	
	0:21:04	Teacher	fence sitters you sit on the fence you're gonna get splinters	
	0:21:08	Angie	but the thing is 'cause when you squeeze slime its squeezable but then so is a cushion and a cushion is a solid	
	0:21:20	Kesar	but doesn't it depend on the how much stuffing the pillow has got some pillows suck when you squeeze it	
	0:21:30	Angie	yeah but this they're still quishable a bit	
	0:21:33	Kesar	I guess	
	0:21:36	Angie	liquid oh yeah liquid has a fixed volume	
	0:21:37	Teacher	[to class] now you're gonna get a chance to add to your answer or change it after the activity ok [to student] nearly finished gentlemen come on you have to explain why you think its a solid you've got to write down why	
	0:21:44	Kesar	I don't know I'm just saying its a solid now	
	0:21:45	Angie	has a fixed volume I'm just lying	
	0:21:49	Kesar	maybe because it probably has a fixed volume or (...)	
	0:22:17	Angie	can it be compressed	
	0:22:19	Kesar	oh wait what probably can oh what	
	0:22:23	Angie	'cause gas can but liquid can't	
	0:22:30	Kesar	I think I don't know it has mass	
	0:22:48	Angie	it looks like its flying out	
	0:22:50	Kesar	[laughs] because its gas	
	0:22:58	Kesar	if not the word focus on the appearance	
	0:23:02	Angie	huh what	
	0:23:05	Kesar	ha I said ignore the word focus on just look in you prac book, there's bound to be something	
	0:23:15	Angie	my foot's gone really weird I can't feel the side of my leg	
	0:23:21	Kesar	I have no book. A solid apparently can be compressed	
	0:23:29	Angie	huh	
	0:23:30	Kesar	a solid can be compressed ooh	
	0:23:33	Angie	a solid can't. I'm compressing the rubber	
	0:23:37	Kesar	yeah but it says the what about a sponge	
	0:23:43	Angie	that's squeezable	
	0:23:35	Teacher	[to class] right hands up if you've finished writing hands up if you've finished writing	
	0:23:40	Student	eee	
	0:23:44	Teacher	right you got two minutes solid or liquid explain why [to Nerita] what have you written Nerita	
	0:23:48	Kesar	I don't know he said it was (...) when I changed it to a (...)	
	0:23:54	Angie	whatever	
	0:23:55	Kesar	um it occupies space	
	0:24:00	Angie	ok I'm done ooh slime I said it was a solid people have their opinion	
	0:24:08	Heath	I I think I might have I think I might have liquid because I think the particles are like more apart	

	0:24:13	Kesar	I wonder if we can make it into a pretty colour. Yay we can.	Referring to colour of slime
	0:24:17	Kesar	well there's red and green	
	0:24:17	Angie	red or green	
	0:24:19	Kesar	red looks like blood green loooks but	
	0:24:23	Angie	I like red	
	0:24:24	Kesar	red does look pretty but	
	0:24:25	Angie	orange	
	0:24:26	Kesar	oh there's orange	
	0:24:28	Kesar	but I think we're stuck there	
	0:24:29	Angie	there's blue over there	
	0:24:31	Kesar	oh there's blue (...)	
	0:24:32	Angie	blue and green there I'll I'll stick with red	
	0:24:36	Kesar	yeah	
	0:24:37	Angie	we're gonna wear lab coats again oh no	

Appendix 2 - Phonological Transcript and Analysis of The Slime Episode

LESSON 7 [19:24-21:45]		ANALYSIS
Teacher	I'm going to (.) <u>ask</u> you a question. And befo:re we can actually make the slime (.) I'm looking for <u>everyone</u> to write a response… And the question is this [points to the question, which he wrote earlier on the whiteboard]. Ah I want you to write in your theory book (.) slime (.) liquid or solid. And the:n (.) I want you: (.) to answer this question… <u>My</u> question of you (.) is <u>based</u> upon (.) <u>all</u> the information I've supplied so ↓far. >Think about the information for example you've done today< with um (.) arrangement of ↓particles .hh the >very first activity we did where we looked at shapes< (.) where we discussed whether >solids liquids or gases< have fixed shape volume (.) >occupy space etcetera etcetera<. Think about all the <u>rules</u> that we've really looked at .hh for solids liquids and gases… I want you to explain why: (.) <u>you</u> think sli:me (.) in your opinion is a <u>solid</u> or a <u>liquid</u>. Now I'm going to <u>give</u> you (.) <u>fi:ve</u> >minutes to write down the answer< (.) and once you've done it ⌈(.)<u>show</u> me.⌉ >'Cause nobody's gonna do the activity< until you've <u>had</u> an <u>attempt</u>.	
. . .		
→ Angie	⌊I think it's <u>both</u>.⌋	This utterance, addressed to Kesar, overlaps the teacher's talk (above). Angie's use of the first person indexes personal responsibility for the opinion expressed. Her use of the first person is consistent with the teacher's instructions ("in your opinion").
Kesar	yeah- ah- can we <u>say</u> it's ↑both?	Kesar's utterance of "yeah-" could be taken as agreement with Angie's opinion. However, she expresses hesitation. In her use of 'we' she positions herself as a member of a collective. The collective here could be just Angie and Kesar, in which case the illocutionary force of its use would be to position herself as taking collective responsibility for the opinion (that slime is "both"), or it could be the group of students in the classroom who have been collectively positioned as obligated to work within the constraints of the teacher's question (i.e. to state ones personal opinion on whether slime was a

		liquid or solid) and saying "its both" does not fit within these constraints. As the conversation continues it appears that Kesar is positioning herself in agreement with Angie's position and taking collective responsibility for the opinion.
→ Angie	>I <u>think</u> so.<	Angie takes personal responsibility for her interpretation of the rules of the activity.
. . .		
Angie	Can we say- °ah yeah okay°	Angie uses the collective first person here. She addresses Kesar (who is writing), appearing to revoice Kesar's earlier question but she trails off and begins writing herself.
Student	Is there something in ⌈bet<u>ween</u>?⌉	A student on a neighbouring table addresses the teacher, asking for clarification of the categories, meaning, is there something in between the states of solid and liquid?
Angie	⌊CAN WE⌋ SAY ITS BOTH? hah .hh	Angie raises her voice and addresses the teacher. However, he has begun replying to the other student.
Teacher	Huh? No. It's one or the other.	The teacher replies to the student above ("is there something in between") with a statement of fact, which has the function here of clarifying the rules under which the students' opinions are to be made. The teacher takes up the responsibility to make the rules.
Angie	Mr Gardiner can we say its <u>both</u>?	Angie repeats her question, this time with his full attention. Here Angie positions the teacher as responsible for the rules under which their opinions are offered. She positions herself as a member of a collective (either herself and Kesar or the students as a whole).
Teacher	OH IF- LOOK (.) IF YOU WANT TO SAY ITS <u>BOTH</u> THAT'S O<u>KAY</u>. BUT I'D PREFER A DEF- DEFINITIVE ↓ANSWER.	The teacher addresses Angie and the class as a whole. In this way he establishes the same rules for all of the students. He uses the first person in a statement of personal preference, adding illocutionary force to his appeal for a "definitive answer". The focus students now have the option of choosing between solid or liquid to please him or staying true to their original opinion.
Student	I said <u>neither</u>.	A student raises her hand and addresses the teacher. A conversation between the teacher and this student develops, which is not attended to by the focus students.
Angie	Are you going to do (.) <u>one</u> (.) or are you going to do-	Angie positions Kesar as responsible for making a choice. The choice referred to here is choosing "one" (either solid or liquid) or choosing both (i.e. standing by her original opinion. However it becomes clear in the conversation that Angie is not just asking Kesar to make a personal choice. In this turn Angie is deferring choice conceived as a collective

		responsibility to Kesar.
Kesar	°I don't kno:w°	Kesar does not explicitly express a choice in reply to Angie. Her reply here is ambiguous. She could be replying to Angie's question and in doing so deflecting the responsibility to make a choice, or she could be already beginning to deliberate over whether slime is a solid or liquid. Her next turn suggests the second interpretation is more likely.
Angie	I think=	
Kesar	=I don't know which one. <Maybe its got free ↑particles>=	Instead of expressing her choice explicitly, Kesar acts within the teacher's preferred storyline by displaying that she is deliberating over one or the other. The perlocutionary force of her display being to answer Angie's question implicitly and decide for their small collective to choose between solid or liquid ("which one").
→ Angie	=>I think its a solid.<	Angie takes up this storyline and offers an opinion indexed to herself personally that satisfies the teacher's preferred rules for the activity.
Angie	>But the thing is< (.) coz when you <u>squeeze</u> slime its squeezable .hh but then (1) so is a cushion (.) and cushions are solid.	Angie shares her reasoning for classifying slime as a solid with Kesar, appealing to Kesar to evaluate her classification.
Kesar	But doesn't it <u>depend</u> on (2) the ho- how much stuff<u>ing</u> the (.) p- pillow has °go(h)t hah° some pillows <u>suck</u> hah .hh °when you squeeze it.°	Kesar responds in kind and expresses some hesitation in accepting Angie's analogy.
Angie	Yeah but they're- they're still squishable a <u>bit</u>.	Angie defends her reasoning drawing upon the property of slime, shared by pillows, that it can be squeezed.
Kesar	I guess.	Kesar expresses reluctant agreement.
Angie	<u>Liquid</u> (.) oh yeah liquid <u>has</u> a fixed volume.	Angie interprets Kesar's reluctance as a reluctance to classify slime as a solid or a liquid. She reasons that liquids have properties similar to slime as well, acknowledging their dilemma and positioning Kesar as responsible to evaluate it.
Kesar	>I don't know I'm just saying its a solid ↓now.<	Kesar acknowledges their dilemma (i.e. that slime seems to have properties of both solids and liquids) but does not take up Angie's positioning. Instead she removes her personal commitment to the correctness of her classification and makes a decision that is satisfactory for her current purposes ("I'm just") to complete the activity according to the teacher's instructions. The illocutionary force of this utterance is to end the discussion. In this way the girls arrive at the shared response that slime is a solid.
→ Abigail	has a fixed volume (.) I'm ju<u>s:t</u> (.) ly:ing	At the beginning of this turn, Angie is articulating words as she writes. In her book she wrote, "To my opinion slime is a solid it has a fixed volume and shape. It has mass". However, in her use of the first person (I'm jus:t ly:ing) she reduces

her personal commitment to her answer.

Appendix 3 - Transcript Notation

LESSON 3 [24:26-28:52]	Extract headings refer to the segment of the lesson shown in the transcript. It includes the lesson number and an interval corresponding to minutes from the start of the lesson.
some ⌈talk⌉ ⌊overlap⌋	Square brackets between lines bracketing two lines of talk indicate the onset and end of overlapping talk
end of line= =start of line	Equal signs indicate latching between utterances.
(.)	Untimed pause
(1.2)	Times pause to the nearest tenth of a second
bu-	A dash shows a sharp cut off of speech
Under; pie	Underlining indicates emphasis
CAPITALS	Capital letters indicate talk that is noticeably louder than surrounding talk
°soft°	Degree signs indicate talk that is noticeably more quiet than surrounding talk
>fast< <slow>	Less-than and greater-than signs indicate talk that is noticeably faster or slower than the surrounding talk
ho:me	A colon indicate an extension of the sound or syllable that it follows
↑rising ↓falling	Upward and downward pointing arrows indicate marked rising and falling shifts in intonation in the talk immediately following
. , ? !	Punctuation marks are used to mark speech delivery rather than grammar. A period indicates a stopping fall in tone; a comma indicates a continuing intonation; a question mark indicates a rising inflection; an exclamation mark indicates an animated or emphatic tone.
wghord	"gh" within a word indicates guttural pronunciation
heh or hah	Indicate laughter
.hh	Audible inbreath
hh	Audible outbreath (sometimes associated with laughter).
Rilly	Modified spelling is used to suggest pronunciation
(word)	Transcriber's guess at unclear material
( )	Unclear speech or noise
[talks while writing]	Brackets enclose contextual information
…	Horizontal ellipses indicate talk omitted from the data segment
. .	Vertical ellipses indicate intervening turns omitted from th data segment
→	A horizontal arrow in the left margin points to an utterance discussed in the text
Repeated symbols indicate, for example: ::: greater elongation °° more quiet hhhh longer outbreath	

Adapted from the system developed by Jefferson (Woods & Kroger 2000, p193)